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ABSORPTION RATE STUDY
VOYAGEURS NATIONAL
PARK AREA

Landmark
Research
Inc.

ABSORPTION RATE STUDY

VOYAGEURS NATIONAL

PARK AREA

1980

PREPARED FOR

LAND ACQUISITION SECTION

LAND AND NATURAL RESOURCES DIVISION

DEPARTMENT OF JUSTICE

PREPARED BY

LANDMARK RESEARCH, INC.

Landmark
Research
Inc.

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Jean B. Davis, MS

November 17, 1980

Philip M. Zeidner, Esquire
Assistant Chief, Land Acquisition Section
Land and Natural Resources Division
Department of Justice
P. O. Box 7415
Benjamin Franklin Station
Washington, D. C. 20044

Dear Mr. Zeidner:

With this letter we are delivering the final Absorption Rate Study for Voyageurs National Park. This report was prepared for the Department of Justice in accordance with contract number JALDN-80-C-0108.

The purpose of this study and report was to determine an absorption rate for properties in the Border Lakes Region of Northern Minnesota to aid in evaluating the general level of supply and effective demand and also generally to evaluate physical characteristics and legal-political constraints that might influence development potential.

We have discussed with you and your staff over the last several months our status and findings by stages. In particular, you are referenced to our letter of July 17, 1980, which summarizes our involvement to that date, our letter and attachments of July 30, 1980, and our summary statement of involvement and conclusions forwarded to you on October 2, 1980, but also our other interim correspondence, all of which are referenced to you but not included by reference in this report.

FOR LANDMARK RESEARCH, INC.

James A. Graaskamp, Ph.D., CRE, SREA

Tim Warner, MS, MAI, SREA

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Enclosure

FORWARD

The current and historic demand for and supply of seasonal subdivision and other land inventory and the absorption rate of land over time, as well as limiting factors that form the context for this absorption are the subject of this report.

Section I of the report describes the background and context of the study. It includes a statement of the problem and a delineation of a study area. Section II describes the physical attributes and possible adaptability of the land to development, the legal and political strictures necessary to be adhered to in the development process, and an analysis of transactions involving subdivisions and land purchased for subdivision purposes as compared to the available inventory of similar lands. An appendix of referenced items follows.

Landmark Research, Inc.

November 17, 1980

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EXHIBITS

1. A Portion of the Tower-Ely Glacial Drift Complex from The Minnesota Soil Atlas
2. The Rainy River Drainage District from Groundwater Resources in Minnesota
3. The Study Area for Absorption Rate Analysis
4. Tower-Ely Glacial Drift Complex Description from Report 110-1971 and Soil Series Field Sheets
5. Location of Tower-Ely Glacial Drift Complex and the Study Area
6. Groundwater Conditions in the Study Area from Groundwater Resources in Minnesota
7. The Subdivision Platting Regulations of Koochiching County, Minnesota
8. Zoning Ordinance for Koochiching County, Minnesota
9. Subdivision Regulations, Ordinance 33, St. Louis County, Minnesota
10. Zoning Ordinance, St. Louis County, Minnesota
11. Pollution Control Agency Standards
12. Variances Granted and Denied in St. Louis County
13. Building Permits Issued for Seasonal Residences in St. Louis County for 1970 - 1979
14. Map of Building Permits Issued by Township and Range
15. Average Daily Traffic Volumes Taken from State Traffic Maps
16. Summary of Seaplane and Floatplane Flights, Bohman Airways, International Falls, Minnesota, Voyageurs National Park, January - September, 1976
17. Lakeshore Subdivisions Platted in St. Louis and Koochiching Counties from 1969 to the Present
18. Lot Sales of Seasonal Residential Subdivisions in St. Louis County from 1969 to the Present
19. Location of Seasonal Subdivisions (Numbers 1 Through 6) and Hybrid Seasonal Subdivisions (Numbers 7 Through 12)
20. Land Purchases for the Purpose of Subdivision Development
21. Map Locating Land Purchased for Subdivision Development
22. Lot Inventory and Sales in Seasonal Subdivisions Within the Study Area

EXHIBITS (Continued)

23. Categorizations by Land Types for Land Sales Researched and Comparison by Category
24. Computation of the Absorption Rate of Lakeshore Land, 1972 to 1980 in the Study Area
25. Minnesota Land Management Information System Report and Correspondence on Shoreland Inventory
26. Government Lands Digest Article from Volume 10, Number 9, page 4 and 10.
27. Characterization of Lands Yet to be Acquired in Voyageur National Park, as of June, 1980 by Categories

SECTION I

BACKGROUND AND CONTEXT

The question of demonstrated market demand vis-a-vis the supply of the commodity and resource of land is most generally described as the absorption rate. This ratio is then a benchmark for the most profitable likely use given the demonstrated demand exhibited by the most recent level of demand. This is the underpinning for just compensation as stated, for example in *Olson vs the United States* 292 US 246 (1934):

Just compensation includes all elements of value that inure in the property, but it does not exceed the market value fairly determined. The sum required to be paid the owner does not depend upon the uses to which he has devoted his land but it is to be arrived at upon just consideration of all the uses for which it is suitable. The highest and most profitable use for which the property is adaptable and needed or likely to be needed in the reasonably near future is to be considered, not necessarily as a measure of value, but to the full extent that the prospect of demand for such use affects the market value while the property is privately held.

In this decision the Supreme Court also noted that "physical adaptability alone" and "elements affecting value that depend upon events or combination of occurrences which, while within the realm of possibility, are not fairly shown to be reasonably probable, should be excluded from consideration, for that would be to allow mere speculation and conjecture. . ." are both elements to be weighed in assessing probability versus possibilities. Accordingly, this report addresses the actual occurrences of land sales and calculates their ratio to the supply of similar lands available and discusses other factors that influence the development of land for residential subdivision purposes.

Voyageurs National Park is located in the northern extremes of Koochiching and St. Louis Counties in the State of Minnesota. This general area is known as the Border Lakes Region. These counties themselves are vast areas with Koochiching comprising 2,030,720 acres or 3,173 square miles and St. Louis

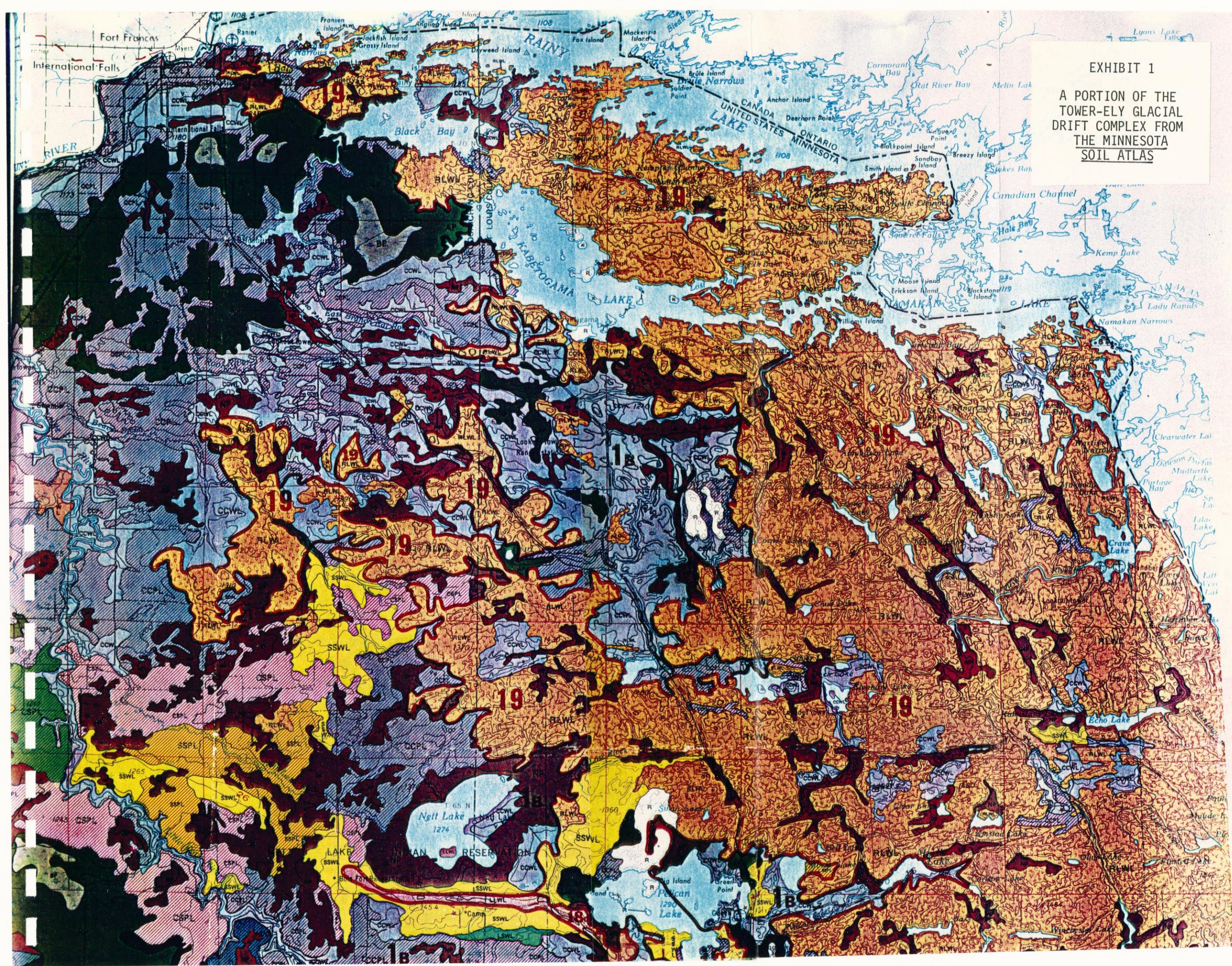
County, which stretches from Duluth and Lake Superior on the south to the Rainy River area of the Border Lakes Region on the North, comprising 4,295,040 acres or 6,711 square miles. To place these sizes in perspective, the State of Delaware is 2,057 square miles, the State of Connecticut is 5,009 square miles, and the State of Massachusetts is 8,257 square miles.

The first order of priority for this analysis becomes the selection of the study area. Because of the possible influence that acquisitions for Voyageurs National Park would have, the study area has to be large enough to negate that influence and large enough to obtain a good cross section of similar properties and yet not so large as to mix in or introduce the influences of dissimilar properties and market factors.

General physical similarity will be measured in two terms: first, the similarity of the soils and substratum, also called geomorphic regions, of the surrounding areas and second, the availability of groundwater, which is a function of the geology of the area and is limited due to the shallow soils and bedrock conditions. Exhibit 1 is a color reproduction of a portion of the International Falls Field Sheet showing the park and surrounding environs. The orange coloring with the superimposed number "19" identifies the Tower-Ely Glacial Drift Complex, which comprises much of the area, and is described in the Minnesota Soil Atlas. Thus, a comparable area for analysis would of necessity be in this complex with its similar soil and bedrock conditions.

Hand-in-hand with the geologic and soil formations is the groundwater that provides the water supply for possible development. The study area should be within a similar area of groundwater occurrence. Exhibit 2 is a reproduction of the Rainy River Drainage District from the publication Groundwater Resources in Minnesota. Similarly, the study area should be consistent in terms of geographic characteristics such as distances to population centers, land use restrictions and politics, and other factors influencing decisions of market

EXHIBIT 1
A PORTION OF THE
TOWER-ELY GLACIAL
DRIFT COMPLEX FROM
THE MINNESOTA
SOIL ATLAS



THE RAINY RIVER DRAINAGE DISTRICT
FROM GROUNDWATER RESOURCES IN MINNESOTA

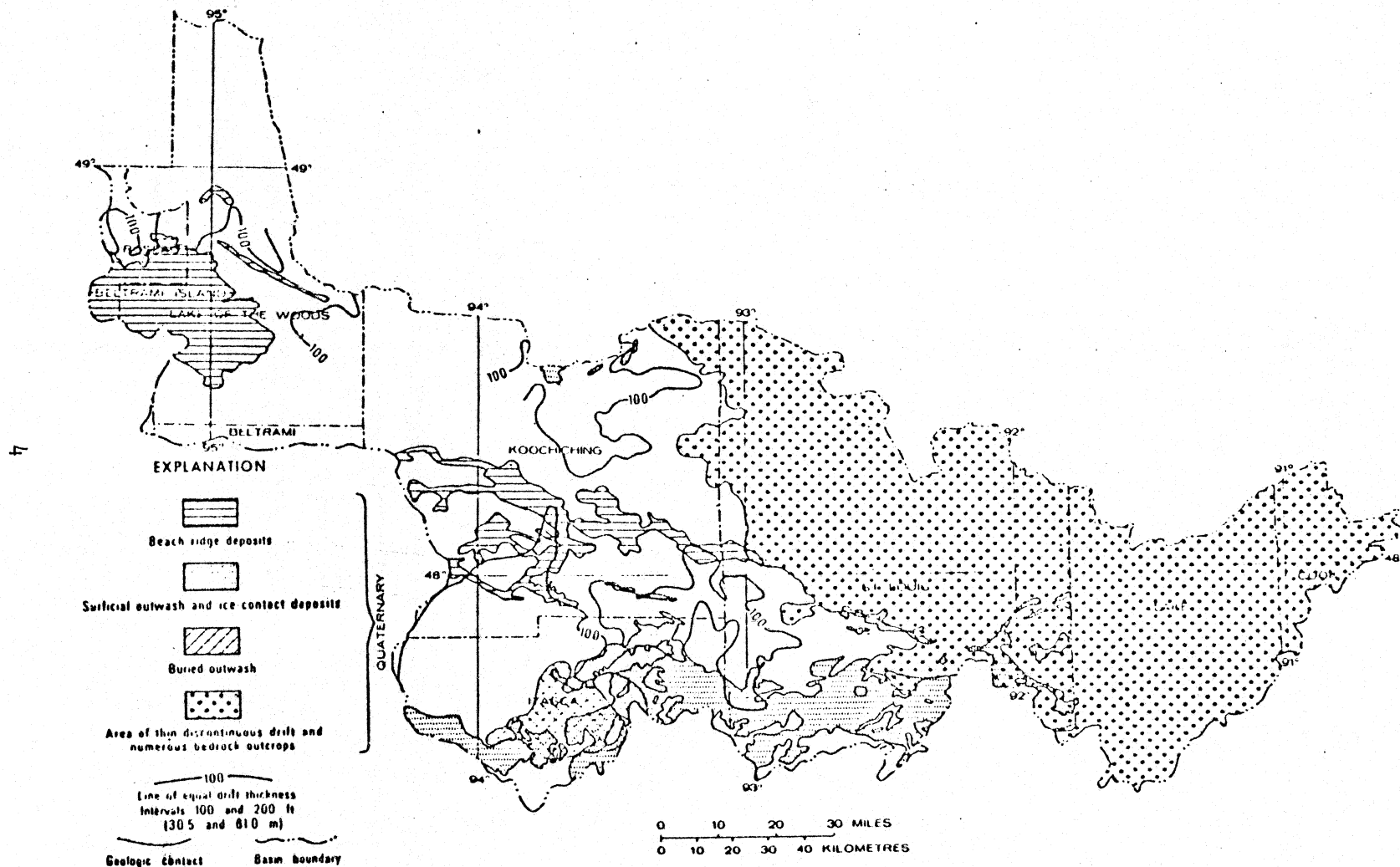


EXHIBIT 2

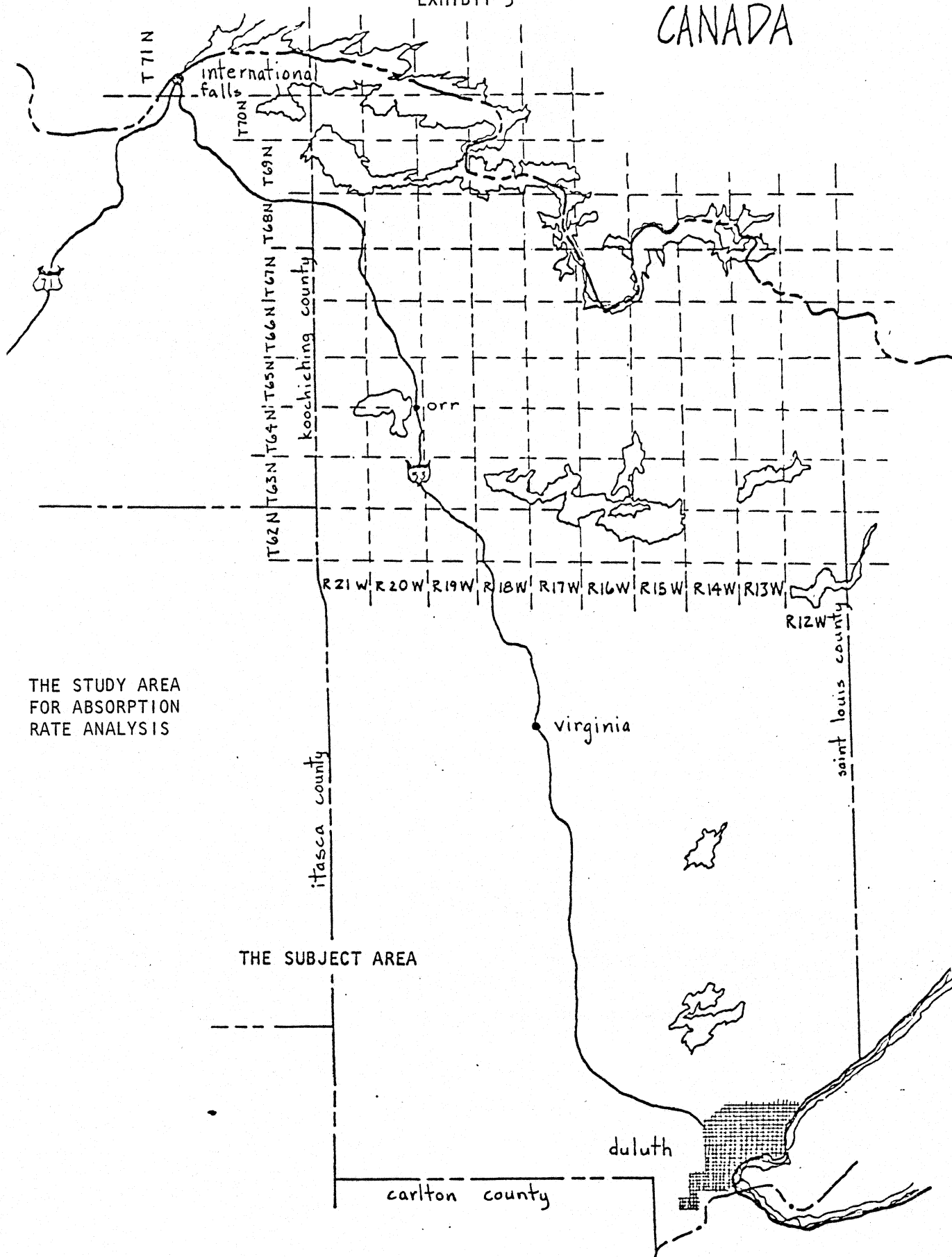
Figure 6.--Drift aquifers in the Rainy River basin

participants. On the first fit only certain portions of northeastern Koochiching County and St. Louis County would fall within the parameters established. Surrounding counties such as Cass and Itasca are characterized by many different soil types with only a very minute portion being in the category of the Tower-Ely Complex. Only a portion of Itasca County falls within the same drift aquifer classification in the Rainy River Drainage Basin. In consideration of these factors, Exhibit 3 shows the study area selected for the absorption rate analysis. It ranges from the eastern St. Louis County line at Range 12 West to Range 21 West and from Township 62 North to Township 71 North. The study area contains portions of 82 townships or approximately 2,952 square miles in northern St. Louis and northeastern Koochiching Counties. This area was chosen on the basis of the best fit to geographic and market features and physical similarities for properties being acquired for Voyageurs National Park. Thus the study area selected after analysis of soil and water conditions as well as analysis of geographic features such as distances to population centers and vehicle counts from highway maps, the number of building permits issued over the last ten years, concentrations of land sales and land use politics, as described later within this report. The study area then represents the most comparable marketing base which is the result of consensus of both supply and demand.

A portion of the Canadian Province of Ontario was studied for possible inclusion within the study area. Soil, water, and bedrock characteristics are classified differently for Canada than they are for northern Minnesota, complicating comparison of physical comparison factors. Information in the public records is much more difficult to access. We have researched sales of Canadian properties to non-residents which have occurred since the imposition of the transfer tax in April of 1974, and they demonstrate a very small market. For the unorganized portion of the Rainy River District of the Province of Ontario, only 41 sales were recorded. Of these, only 19 are unimproved land or have minor building improvements with the

EXHIBIT 3

CANADA



value primarily attributable to the land. Only two had no building improvements whatsoever as of the dates of sale. These sales occurred over six years in a district of 6,000 square miles. Because of these factors, a portion of Canada was not included within the study area.

A number of terms have been used throughout this report which need to be operationally defined. These definitions have been selected from studies of regulations, ordinances, or statutes that apply within the study area. A "lot" refers to a lot in a recorded subdivision plat. "Small acreage" refers to unplatted land of less than five acres. "Acreage" or "large acreage" refers to unplatted land of five or more acres. These definitions are in accord with the county subdivision ordinance. There are no requirements for platting by the statutes of the State of Minnesota. Individual counties exercise these controls. Although there are many similarities in comparing county subdivision ordinances, there are also differences and each county's ordinance must be examined individually. For example, the St. Louis County Subdivision Ordinance requires an improved plat for any subdivision of land which creates two parcels of five acres or less. The procedures in obtaining a final plat, from preliminary concept through preliminary plans and plats, the posting of bonds for performance, and the establishment of an Owners' Association as mandated under the county zoning ordinances, will be discussed in detail. It will be seen that subdividing land is not simply a matter of hiring a surveyor and posting a for sale sign on the lots bordering the nearest roadway.

SECTION II

PHYSICAL CHARACTERISTICS OF THE AREA

Perhaps the dominant physical feature of the study area is the underlying ancient Precambrian rocks substratum and outcropping and their nearness to the soil surface. The rock outcroppings and abrupt changes in elevations, especially along the lakeshore, give the area an impression of rugged beauty, but the steep slopes and the swamps and bogs that are common throughout the area "provide localized constraints to construction of trails or other facilities."¹ The study area is located in the southern portion of the Canadian Shield, a vast substratum of ancient rock that forms the nucleus of the North American continent. The elements that comprise the Canadian Shield represent some of the oldest rock formations in the world. The soils in the area were formed either by glacial deposits or as a result of sedimentation from glacial-aged lakes. The presence of rocky, shallow soils in the uplands and organic soils in the lowlands reflect this formation history.

The Department of Soil Science of the University of Minnesota in cooperation with the Soil Conservation Service of the U.S. Department of Agriculture and the Minnesota Geological Survey prepared a Minnesota Soil Atlas. Exhibits 1 and 4 are extracts from this work. Exhibit 1 shows the general soil groupings within the area. It specifically shows the predominance of the Tower-Ely Glacial Drift, an area of thin soil and rocky outcrops, represented by the yellow-orange portion of the map superimposed with the red 19. This number 19 refers to the description of the underlying area reflected in Exhibit 4. In order to provide this generalized soil map for users with minimum soils knowledge, the soils are grouped into soil landscape units based on the following factors. The four-letter codes, such as RLWL, are four descriptors of the soil in the grouping area. The first letter refers to the texture of the soil material below five feet. The R in this case

¹Page 40 of the Final Environmental Impact Statement for Voyageurs National Park, by the U.S. Department of the Interior.

EXHIBIT 4

TOWER-ELY GLACIAL DRIFT COMPLEX DESCRIPTION FROM REPORT 110 - 1971 AND SOIL SERIES FIELD SHEETS

TOWER-ELY GLACIAL DRIFT AND BEDROCK COMPLEX (19)

This region encompasses about 309,500 acres or 7.7 percent of the Hibbing Sheet.

Topography ranges from rolling to very steep and is characterized by short complex slopes. Rock outcrops, totaling 5 percent or less of the region, commonly occur on ridges and hilltops. Bedrock escarpments are common. A thin veneer of stony and cobbly glacial drift generally less than 4 feet thick covers the bedrock. The drift is composed of brown-colored acid, coarse loamy sands, and sandy loams. Approximately 5 percent of the region has deep sands and gravels 10 to 30 feet thick. Low flat areas and drainageways contain silty clay sediments associated with old glacial lake beds. These areas represent an estimated 5 percent of the region.

There are 28 lakes, each 160 acres or more in size and totaling 56,680 acres, located here. They include some popular recreational lakes of which Lake Vermilion is the largest.

The original vegetation was conifers. Essentially no agriculture is located in the region. Present forest cover

is mainly aspen, jack pine, balsam fir, black spruce, and white birch. Whitetail deer are quite common (see figure 3).

Four soil landscape units occur in the geomorphic region. Selected properties of each are shown in table 9. Additional features follow:

RSWL—Inclusions of about 5 percent of poorly drained lacustrine clays occur along some drains and in low flats. Bedrock outcrops in about 5 percent of the unit, and is commonly within 4 to 6 feet of the surface in the remaining area. Cobbly sandy loams occupy about 40 percent of the unit.

P—The unit includes 5 to 10 percent of poorly and very poorly drained mineral soils.

RLWL—Approximately 30 percent of the unit consists of Conic, Barto, and Toivola soils. Stones and cobbles are numerous throughout the soil profiles.

SSWL—Bedrock is generally over 20 feet below the surface. Toivola soils occupy a major part of the unit.

Table 9. Selected features of soil landscape units within the Tower-Ely Glacial Drift and Bedrock Complex (19) geomorphic region

Soil landscape unit	Percent geomorphic region	Topography and landscape position	Most common texture and thickness (feet)		Moisture relationships		Approximate fertility in rooting zone			Major soil series
			Rooting zone	Substratum	Inches of available water to 5 feet	Drainage class	pH	P	K	
RSWL	14	shallow drift over bedrock; rolling to steep	cobbly loamy sand and sandy loam (1-2)	bedrock and stony, gravelly loamy sand (2+)	0-4	well to excessively drained	5.0-6.0	medium	low	Conic, Barto
P	4	depressional	peat	peat	12+	very poorly drained	< 6.0	low	low	Peat
RLWL	2	shallow drift over bedrock; rolling to steep	sandy loam and cobbly loamy sand (1-2)	sandy loam and bedrock (2-4+)	0-8	well to excessively drained	< 6.0	low	low	Mesaba, Insula, Newfound, Quetico
SSWL	2	strongly rolling drift	loamy sand (1-3)	sand and gravel (3-20+)	< 4	well to excessively drained	5.5-6.2	medium	low	Toivola, Vilas
Water	18									

TABLE 10

SELECTED CHARACTERISTICS OF SOILS IN THE DOMINANT
LANDSCAPE UNIT OF TOWER-ELY GLACIAL DRIFT COMPLEX

Soil Series	Conic	Barto	Toivola	Mesaba	Insula	Newfound	Quetico
Depth to Bedrock	30 inches	15 inches	sand below 60 inches	28 inches	15 inches	sandy loam below 60 inches	5 inches
Permeability in./hr. (range)	.06 - 6.0	2.0 - 6.0	6.0 - 20.0	2.0 - 6.0	2.0 - 6.0	.06 - 6.0	.6 - 2.0
Limitations for Septic Tank & Fields	Severe	Severe	Severe	Severe	Severe	Severe	Severe
Limitations for Shallow Excavations	Severe	Severe	Severe	Severe	Severe	0 - 8% - Slight 8 - 15% - Moderate 15% - Severe	Severe
Limitations for Dwellings without Basements	2 - 15% slope - Moderate 15+% slope - Severe	Severe	0 - 8% - Slight 8 - 15% - Moderate 15+% - Severe	8 - 15% - Moderate 15+% - Severe	Severe	0 - 8% - Slight 8 - 15% - Moderate 15% - Severe	Severe
Limitations of Local Roads and Streets	2 - 15% slope - Moderate 15+% slope - Severe	Severe	0 - 8% - Slight 8 - 15% - Moderate 15+% - Severe	8 - 15% - Moderate 15+% - Severe	Severe	0 - 8% - Slight 8 - 15% - Moderate 15% - Severe	Severe
% of Slopes	2 - 35%	2 - 35%	0 - 60%	0 - 35%	2 - 35%	0 - 20%	5 - 35%

MLRA(S): 89, 90

REV. AEJ,RHM, 9-77

TYPIC FRAGIOCHREPTS, COARSE-LOAMY, MIXED, FRIGID

THE CONIC SERIES CONSISTS OF WELL DRAINED SOILS FORMED IN GLACIAL TILL. THE SURFACE LAYER IS LIGHT BROWNISH-GRAY GRAVELLY SANDY LOAM 2 INCHES THICK. THE UPPER SUBSOIL IS DARK BROWN AND YELLOWISH-BROWN GRAVELLY SANDY LOAM 7 INCHES THICK. THE NEXT LAYER IS LIGHT YELLOWISH-BROWN GRAVELLY SANDY LOAM 6 INCHES THICK. THE NEXT LAYER IS LIGHT YELLOWISH-BROWN AND YELLOWISH-BROWN GRAVELLY SANDY LOAM 11 INCHES THICK. THE LOWER SUBSOIL IS YELLOWISH-BROWN GRAVELLY SANDY LOAM 4 INCHES THICK. THE UNDERLYING MATERIAL IS BEDROCK. SLOPES RANGE FROM 2 TO 35 PERCENT. MOST AREAS ARE IN FOREST.

ESTIMATED SOIL PROPERTIES

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT >3 IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO. 4 10 40 200	LIQUID LIMIT	PLAS- TICITY
0-15	GR-SL	SM. GM	A-2, A-4	5-40	50-75 40-65 30-55 20-50	<20	NP-4
15-30	GR-SL	SM. GM	A-2, A-4	5-40	50-75 40-65 30-55 20-50	<20	NP-4
30	UWS						

DEPTH (IN.)	MOIST CLAY (PCT) (2MM)	BULK DENSITY (G/CM3)	PERMEA- BILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHDS/CM)	SHRINK- SWELL POTENTIAL	EROSION FACTORS K Y	WIND EROO. GROUP	ORGANIC MATTER (PCT)	CORROSIVITY STEEL CONCRETE
0-15			2.0-6.0	0.10-0.15	3.6-6.0	-	LOW	.15	2	8	LOW MODERATE
15-30			0.05-0.2	0.05-0.09	4.5-6.0	-	LOW	.15			
30											

FLOODING			HIGH WATER TABLE			CEMENTED PAN		BEDROCK		SUBSIDENCE		HYD	POTENTIAL
FREQUENCY	DURATION	MONTHS	DEPTH (FT)	KIND	MONTHS	DEPTH (IN)	HARDNESS	DEPTH (IN)	HARDNESS	INITIAL	TOTAL	GRP	FROST ACTION
NONE			>8.0			10-24	THIN	20-40	HARD	-		C	MODERATE

SANITARY FACILITIES

SEPTIC TANK ABSORPTION FIELDS	SEVERE-DEPTH TO ROCK.CEMENTED PAN. PERCS SLOWLY	ROADFILL	2-25%: POOR-AREA RECLAIM 25%: POOR-AREA RECLAIM.SLOPE
SEWAGE LAGOON AREAS	SEVERE-SEEPAGE.DEPTH TO ROCK.CEMENTED PAN	SAND	IMPROBABLE-EXCESS FINES
SANITARY LANDFILL (TRENCH)	2-15%: SEVERE-DEPTH TO ROCK.LARGE STONES 15%: SEVERE-DEPTH TO ROCK.SLOPE. LARGE STONES	GRAVEL	IMPROBABLE-EXCESS FINES
SANITARY LANDFILL (AREA)	SEVERE-DEPTH TO ROCK.CEMENTED PAN.SEEPAGE	TOPSOIL	2-15%: POOR-AREA RECLAIM.SMALL STONES 15%: POOR-AREA RECLAIM.SMALL STONES.SLOPE
DAILY COVER FOR LANDFILL	2-15%: POOR-AREA RECLAIM.SMALL STONES 15%: POOR-AREA RECLAIM.SMALL STONES.SLOPE	POND RESERVOIR AREA	2-6%: SEVERE-CEMENTED PAN 6%: SEVERE-CEMENTED PAN.SLOPE

BUILDING SITE DEVELOPMENT

SHALLOW EXCAVATIONS	2-15%: SEVERE-DEPTH TO ROCK.CEMENTED PAN. 15%: SEVERE-DEPTH TO ROCK.CEMENTED PAN. SLOPE	EMBANKMENTS DIKES AND LEVEES	SEVERE-LARGE STONES
DWELLINGS WITHOUT BASEMENTS	2-6%: MODERATE-DEPTH TO ROCK.CEMENTED PAN 6-15%: MODERATE-SLOPE.DEPTH TO ROCK. CEMENTED PAN 15%: SEVERE-SLOPE	EXCAVATED POND AQUIFER FED	SEVERE-NO WATER
DWELLINGS WITH BASEMENTS	2-15%: SEVERE-DEPTH TO ROCK.CEMENTED PAN 15%: SEVERE-DEPTH TO ROCK.CEMENTED PAN. SLOPE	DRAINAGE	DEEP TO WATER
SMALL COMMERCIAL BUILDINGS	2-4%: MODERATE-DEPTH TO ROCK.CEMENTED PAN 4-6%: MODERATE-SLOPE.DEPTH TO ROCK. CEMENTED PAN 6%: SEVERE-SLOPE	IRRIGATION	LARGE STONES.DROUGHTY.PERCS SLOWLY
LOCAL ROADS AND STREETS	2-6%: MODERATE-DEPTH TO ROCK.CEMENTED PAN 6-15%: MODERATE-DEPTH TO ROCK.CEMENTED PAN. SLOPE 15%: SEVERE-SLOPE	TERRACES AND DIVERSIONS	2-6%: LARGE STONES.DEPTH TO ROCK 6%: SLOPE.LARGE STONES.DEPTH TO ROCK
LAWNS. LANDSCAPING AND GOLF FAIRWAYS	2-15%: SEVERE-SMALL STONES.LARGE STONES 15%: SEVERE-SMALL STONES.LARGE STONES.SLOPE	GRASSED WATERWAYS	2-6%: LARGE STONES.DROUGHTY 6%: LARGE STONES.SLOPE.DROUGHTY

REGIONAL INTERPRETATIONS

PASTURE AND HAY	2-12%: GROUP 9 12%: GROUP 10
--------------------	---------------------------------

RECREATIONAL DEVELOPMENT			
CAMP AREAS	2-15%: SEVERE-SMALL STONES.CEMENTED PAN 15+%: SEVERE-SLOPE.SMALL STONES.CEMENTED PAN	PLAYGROUNDS	2-6%: SEVERE-SMALL STONES.CEMENTED PAN 6+%: SEVERE-SLOPE.SMALL STONES.CEMENTED PAN
PICNIC AREAS	2-15%: SEVERE-SMALL STONES.CEMENTED PAN 15+%: SEVERE-SLOPE.SMALL STONES.CEMENTED PAN	PATHS AND TRAILS	2-15%: MODERATE-LARGE STONES 15-25%: MODERATE-LARGE STONES.SLOPE 25+%: SEVERE-SLOPE

[illegible]

CLASS- DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS					POTENTIAL PRODUCTIVITY		TREES TO PLANT
		EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT.Y.	WINDTH. HAZARD	PLANT COMPET.	COMMON TREES	SITE INDEX	
2-12%	40	SLIGHT	SLIGHT	MODERATE	MODERATE	SLIGHT	RED PINE	45	JACK PINE
12+%	40	MODERATE	MODERATE	MODERATE	MODERATE	SLIGHT	EASTERN WHITE PINE	45	
							JACK PINE	49	
							QUAKING ASPEN	45	
							PAPER BIRCH	45	

CLASS-DETERMIN'G PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
2-12%	EASTERN REDCEDAR	15	NORTHERN WHITE-CEDAR	11	JACK PINE	20	SIBERIAN CRABAPPLE	12

CLASS- DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS								POTENTIAL AS HABITAT FOR:			
	GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWO TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	OPEN/D WILDLF	WOODLD WILDLF	WETLAND WILDLF	RANGELO WILDLF
ALL	POOR	POOR	FAIR	FAIR	FAIR	-	V. POOR	V. POOR	POOR	FAIR	V. POOR	

[illegible]

A 2-12X: WINDBREAK GROUP 6, 12+X WINDBREAK GROUP, 7.

MLRA(S): 93

REV. AEJ-RHM, 2-77

LITHIC DYSTROCHREPTS, LOAMY, MIXED, FRIGID

THE BARTO SERIES CONSISTS OF SHALLOW WELL DRAINED SOILS THAT FORMED IN AN 8 TO 20 INCH MANTLE OF LOAMY GLACIAL DRIFT OVER BEDROCK UNDER DECIDUOUS AND CONIFEROUS FOREST. TYPICALLY, THEY HAVE A THIN ORGANIC MAT OVER REDDISH-BROWN GRAVELLY LOAM AND YELLOWISH-RED GRAVELLY LOAMY COARSE SAND, 8 INCHES THICK. THE NEXT LAYER IS YELLOWISH-RED AND STRUNG BROWN GRAVELLY COARSE SANDY LOAM, 7 INCHES THICK. UNDERLAIN BY BEDROCK. SLOPES RANGE FROM 2 TO 35 PERCENT. MOST AREAS ARE FORESTED.

ESTIMATED SOIL PROPERTIES

ARE FORESTED.

ESTIMATED SOIL PROPERTIES													
DEPTH (IN.)	USDA TEXTURE		UNIFIED	AASHTO		FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO.				LIQUID LIMIT	PLAS- TICITY INDEX	
							4	10	40	200			
0-8	GR-CO SL, GR-SL, GR-FSL		GM, SM	A-2, A-1		5-25	55-80	45-70	30-50	15-35	-	NP	
0-8	GR-L, GR-SIL		GM, SM	A-4		5-25	55-80	45-70	40-65	35-50	18-25	NP-4	
8-15	GR-CO SL, GR-SL		GM, SM	A-2, A-1		5-25	55-80	50-75	30-50	15-35	15-23	NP-4	
15	UMB												

DEPTH (IN.)	CLAY (PCT (2MM))	MOIST BULK DENSITY (G/CM3)	PERMEA- BILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK- SWELL POTENTIAL K	EROSION FACTORS K	WIND EROD. T	ORGANIC MATTER (PCT)	CORROSIVITY		
											STEEL	CONCRETE	
0-8	6-10	0.90-1.10	2.0-6.0	0.12-0.15	4.5-6.5	-	LOW	.20	1	5	5-7	LOW	MODERATE
0-8	6-12	0.90-1.10	2.0-6.0	0.15-0.18	4.5-6.5	-	LOW	.24	1	5	5-7		
8-15	2-10	1.10-1.40	2.0-6.0	0.08-0.12	4.5-6.5	-	LOW	.20					
15													

FLOODING			HIGH WATER TABLE			CEMENTED PAN		BEDROCK		SUBSIDENCE		HYD	POTENTIAL
FREQUENCY	DURATION	MONTHS	DEPTH (FT)	KIND	MONTHS	DEPTH (IN)	HARDNESS	DEPTH (IN)	HARDNESS	INIT. (IN)	TOTAL (IN)	GRP	FROST ACTION
NONE			>6.0			-		8-20	HARD	-		D	MODERATE

SANITARY FACILITIES

CONSTRUCTION MATERIAL

SEPTIC TANK ABSORPTION FIELDS	2-15%: SEVERE-DEPTH TO ROCK 15+X: SEVERE-DEPTH TO ROCK, SLOPE	ROADFILL	2-25%: POOR-AREA RECLAIM 25+X: POOR-AREA RECLAIM, SLOPE
SEWAGE LAGOON AREAS	2-7%: SEVERE-SEEPAGE, DEPTH TO ROCK 7+X: SEVERE-SEEPAGE, DEPTH TO ROCK, SLOPE	SAND	IMPROBABLE-EXCESS FINES
SANITARY LANDFILL (TRENCH)	2-15%: SEVERE-DEPTH TO ROCK, SEEPAGE 15+X: SEVERE-DEPTH TO ROCK, SEEPAGE, SLOPE	GRAVEL	IMPROBABLE-EXCESS FINES
SANITARY LANDFILL (AREA)	2-15%: SEVERE-DEPTH TO ROCK, SEEPAGE 15+X: SEVERE-DEPTH TO ROCK, SEEPAGE, SLOPE	TOPSOIL	2-15%: POOR-AREA RECLAIM, SMALL STONES 15+X: POOR-AREA RECLAIM, SMALL STONES, SLOPE
DAILY COVER FOR LANDFILL	2-15%: POOR-AREA RECLAIM, SMALL STONES 15+X: POOR-AREA RECLAIM, SMALL STONES, SLOPE	POND RESERVOIR AREA	2-8%: SEVERE-DEPTH TO ROCK 8+X: SEVERE-DEPTH TO ROCK, SLOPE

BUILDING SITE DEVELOPMENT

SHALLOW EXCAVATIONS	2-15%: SEVERE-DEPTH TO ROCK 15+X: SEVERE-DEPTH TO ROCK, SLOPE	EMBANKMENTS DIKES AND LEVEES	SEVERE-SEEPAGE
DWELLINGS WITHOUT BASEMENTS	2-15%: SEVERE-DEPTH TO ROCK 15+X: SEVERE-SLOPE, DEPTH TO ROCK	EXCAVATED PONDS AQUIFER FED	SEVERE-NO WATER
DWELLINGS WITH BASEMENTS	2-15%: SEVERE-DEPTH TO ROCK 15+X: SEVERE-DEPTH TO ROCK, SLOPE	DRAINAGE	DEEP TO WATER
SMALL COMMERCIAL BUILDINGS	2-8%: SEVERE-DEPTH TO ROCK 8+X: SEVERE-SLOPE, DEPTH TO ROCK	IRRIGATION	2-3%: DEPTH TO ROCK 3+X: DEPTH TO ROCK, SLOPE
LOCAL ROADS AND STREETS	2-15%: SEVERE-DEPTH TO ROCK 15+X: SEVERE-DEPTH TO ROCK, SLOPE	TERRACES AND DIVERSIONS	2-8%: LARGE STONES, DEPTH TO ROCK 8+X: SLOPE, LARGE STONES, DEPTH TO ROCK
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	2-15%: SEVERE-SMALL STONES, THIN LAYER 15+X: SEVERE-SMALL STONES, SLOPE, THIN LAYER	GRASSED WATERWAYS	2-8%: LARGE STONES, DEPTH TO ROCK 8+X: LARGE STONES, SLOPE, DEPTH TO ROCK

REGIONAL INTERPRETATIONS

PASTURE AND HAYLAND	2-12%: GROUP 9 12-18%: GROUP 10 18-35%: GROUP 11
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RECREATIONAL DEVELOPMENT			
CAMP AREAS	2-15X: SEVERE-SMALL STONES,DEPTH TO ROCK 15+X: SEVERE-SLOPE,SMALL STONES. DEPTH TO RUCK	PLAYGROUNDS	2-6X: SEVERE-SMALL STONES,DEPTH TO ROCK 6+X: SEVERE-SLOPE,SMALL STONES,DEPTH TO ROCK
PICNIC AREAS	2-15X: SEVERE-SMALL STONES,DEPTH TO ROCK 15+X: SEVERE-SLOPE,SMALL STONES. DEPTH TO ROCK	PATHS AND TRAILS	2-15X: SLIGHT 15-25X: MODERATE-SLOPE 25+X: SEVERE-SLOPE

CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)													
CLASS- DETERMINING PHASE	CAPA- BILITY	GRASS- LEGUME HAY		GRASS HAY		KENTUCKY BLUEGRASS (AUM)							
		(TONS)	(TONS)	(TONS)	(TONS)	(AUM)	(AUM)						
0-18%	6E	-	3.0	-	2.5	-	1.2						
18-35%	7E	-	-	-	-	-	0.8						

CLASS- DETERMINING -PHASE	ORD SYM	MANAGEMENT PROBLEMS					POTENTIAL PRODUCTIVITY		TREES TO PLANT
		EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	COMMON TREES	SITE INDEX	
		0-18%	40	SLIGHT	SLIGHT	MODERATE	MODERATE	SLIGHT	
18+%	40	MODERATE	MODERATE	SEVERE	MODERATE	SLIGHT	JACK PINE	49	
							QUAKING ASPEN	45	
							PAPER BIRCH	45	

CLASS-DETERMINING PHASE		SPECIES	HT	VINEHEADS (A)		SPECIES	HT	SPECIES	HT	SPECIES	HT
2-12X		EASTERN REDCEDAR	15	NORTHERN WHITE-CEDAR	11	WHITE SPRUCE	18	SIBERIAN PEASHRUB	11		
		RED PINE	20	JACK PINE	20	SILVER BUFFALOBERRY	12	TATARIAN HONEYSUCKLE	11		
		SIBERIAN CRABAPPLE	12								

CLASS- DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS								POTENTIAL AS HABITAT FOR:			
	GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDW. TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	OPENLD WILDLF	WOODLD WILDLF	WETLAND WILDLF	RANGEL WILDLF
	ALL	POOR	POOR	POOR	POOR	FAIR	-	V. POOR	V. POOR	POOR	POOR	V. POOR

POTENTIAL NATIVE PLANT COMMUNITY (RANGE AND OR FOREST) VEGETATION						
COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE				
POTENTIAL PRODUCTION (LBS./AC. DRY WT.):						
FAVORABLE YEARS						
NORMAL YEARS						
UNFAVORABLE YEARS						

A 2-12X: WINDBREAK GROUP 6. 12+X: WINDBREAK GROUP 7.

440253

SOIL INTERPRETATIONS RECORD

TUJOLA SERIES

MLRA(S): 88, 89, 90
REV. JAS-JFO, 3-60
TYPIC MOUNTAINS, SANDY-SKELETAL, MIXED, FRIGID

THE TUJOLA SERIES CONSISTS OF DEEP, EXCESSIVELY-DRAINED SOILS FORMED IN SANDY AND GRAVELLY GLACIAL OUTWASH DEPOSITS UNDER MIXED DECIDUOUS AND CONIFEROUS FOREST ON UPLANDS. THE SURFACE LAYER IS BLACK AND GRAYISH BROWN VERY GRAVELLY COARSE SANDY LOAM 2 INCHES THICK. THE SUBSOIL IS DARK YELLOWISH BROWN AND YELLOWISH BROWN GRAVELLY LOAMY SAND AND VERY GRAVELLY LOAMY COARSE SAND 14 INCHES THICK. THE SUBSTRATUM IS YELLOWISH BROWN VERY GRAVELLY COARSE SAND. SLOPES RANGE FROM 0 TO 60 PERCENT. AREAS ARE USED FOR WOODLAND.

ESTIMATED SOIL PROPERTIES													
DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO.	LIQUID LIMIT	PLAS- TICITY							
0-5	GRV-COUL, GR-SL	GM, SP, GW, SM	A-1	0-15	20-60	10-50	10-35	5-20	<20	NP			
5-24	GRV-LCOS, GRV-S	GP, GW, SM, SP	A-1	5-20	20-35	10-45	5-30	0-5	<20	NP			
24-60	GRV-COS, GM-S	GP, GW, SM, SP	A-1	5-20	20-55	10-45	5-30	0-5	<20	NP			
DEPTH (IN.)	CLAY (PCT)	MOIST BULK DENSITY (G/CM ³)	PERME- ABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK- SWELL POTENTIAL	EROSION FACTORS	WIND EROD- GROUP	ORGANIC MATTER (PCT)	CORROSIVITY	STEEL	CONCRETE
0-5	0-10	1.40-1.60	6.0-20	0.08-0.12	4.5-6.5	-	LOW	10	3	8	<1	LOW	MODERATE
5-24	0-10	1.45-1.70	>20	0.04-0.08	4.5-6.5	-	LOW	10	10				
24-60	0-10	1.45-1.70	>20	0.02-0.04	4.5-6.5	-	LOW	10					
FLOODING				HIGH WATER TABLE				CEMENTED PAN				SUBSISTENCE	
FREQUENCY	DURATION	MONTHS	DEPTH (FT)	DEPTH (IN)	KIND	MONTHS	DEPTH (IN)	DEPTH (IN)	HARDNESS	DEPTH (IN)	HARDNESS	INITIAL	TOTAL GRP
NONE			>6.0										

SANITARY FACILITIES				CONSTRUCTION MATERIAL			
SEPTIC TANK ABSORPTION FIELDS	0-15%: SEVERE-POOR FILTER 15+%: SEVERE-POOR FILTER, SLOPE			ROADFILL	0-15%: GOOD 15-25%: FAIR-SLOPE 25+%: POOR-SLOPE		
SEWAGE LAGOON AREAS	0-7%: SEVERE-SEEPAGE 7+%: SEVERE-SEEPAGE, SLOPE			SAND	PROBABLE		
SANITARY LANDFILL (TRENCH)	0-15%: SEVERE-SEEPAGE, TOO SANDY 15+%: SEVERE-SEEPAGE, SLOPE, TOO SANDY			GRAVEL	PROBABLE		
SANITARY LANDFILL (AREA)	0-15%: SEVERE-SEEPAGE 15+%: SEVERE-SEEPAGE, SLOPE			TOPSOIL	0-15%: POOR-SMALL STONES, AREA RECLAIM 15+%: POOR-SMALL STONES, AREA RECLAIM, SLOPE		
DAILY COVER FOR LANDFILL	POOR-SEEPAGE, TOO SANDY, SMALL STONES						
BUILDING SITE DEVELOPMENT				WATER MANAGEMENT			
SHALLOW EXCAVATIONS	0-15%: SEVERE-CUTBANKS CAVE 15+%: SEVERE-CUTBANKS CAVE, SLOPE			EMBANKMENTS DIKES AND LEVEES	SEVERE-SEEPAGE		
DWELLINGS WITH BASEMENTS	0-8%: SLIGHT 8-15%: MODERATE-SLOPE 15+%: SEVERE-SLOPE			EXCAVATED PONDS AQUIFER FED	SEVERE-NO WATER		
DWELLINGS WITH BASEMENTS	0-8%: SLIGHT 8-15%: MODERATE-SLOPE 15+%: SEVERE-SLOPE			DRAINAGE	DEEP TO WATER		
SMALL COMMERCIAL BUILDINGS	0-4%: SLIGHT 4-8%: MODERATE-SLOPE 8+%: SEVERE-SLOPE			IRRIGATION	0-3%: DROUGHTY 3+%: DROUGHTY, SLOPE		
LOCAL ROADS AND STREETS	0-8%: SLIGHT 8-15%: MODERATE-SLOPE 15+%: SEVERE-SLOPE			TERRACES AND DIVERSIONS	0-8%: LARGE STONES, TOO SANDY 8+%: SLOPE, LARGE STONES, TOO SANDY		
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	0-15%: SEVERE-SMALL STONES, DROUGHTY 15+%: SEVERE-SMALL STONES, DROUGHTY, SLOPE			GRASSSED WATERWAYS	0-8%: LARGE STONES, DROUGHTY 8+%: LARGE STONES, SLOPE, DROUGHTY		

REGIONAL INTERPRETATIONS

MAR 14 1960

MLPA(1): 84, 90
 REV. ALJ-RHH, 9-77
 TYPIC DYSTROCHRELPTS. COARSE-LOAMY, MIXED, FRIGID

THE MESABA SERIES CONSISTS OF WELL-DRAINED SOILS FORMED IN GLACIAL TILL OVERLYING BEDROCK ON UPLANDS. THIS SOIL HAS 1 1/2 INCHES OF DECOMPOSED PLANT REMAINS OVERLYING THE DARK BROWN, BROWN, AND STRONG BROWN GRAVELLY SANDY LOAM SUBSOIL. 28 INCHES THICK. THE UNDERLYING MATERIAL IS GABBRO BEDROCK. SLOPES RANGE FROM 0 TO 35 PERCENT. MOST AREAS ARE IN FOREST.

ESTIMATED SOIL PROPERTIES																
DEPTH (IN.)	USDA TEXTURE		UNIFIED		AASHTO		PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO.				LIQUID LIMIT	PLAS- TICITY INDEX				
							(PCT)	4	10	40	200					
0-28	GR-SL, GR-L, GR-SIL		SM, GM		A-1, A-2		10-30	50-85	40-75	30-55	15-35	12-20	NP-4			
28	UWB															
DEPTH (IN.)	CLAY (PCT [2MM])	MOIST BULK DENSITY (G/CM3)	PERMEA- BILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK- SWELL POTENTIAL	EROSION FACTORS K T	WIND EROD. GROUP	ORGANIC MATTER (PCT)	CORROSIVITY					
											STEEL	CONCRETE				
0-28			2.0-6.0	0.10-0.15	4.5-6.5	-	LOW	.17	2	8	LOW	MODERATE				
28																
FLOODING				HIGH WATER TABLE		CEMENTED PAN		BEDROCK		SUBSIDENCE		HYD	POTENTIAL			
				DEPTH (FT)	KIND	MONTHS	DEPTH (IN)	HARDNESS	DEPTH (IN)	HARDNESS	INIT. TOTAL	GRP	FROST ACTION			
FREQUENCY				DURATION		MONTHS	2.0-3.0 PERCHED		OCT-JUN		-	20-40	HARD	-	C	MODERATE
NONE																

SANITARY FACILITIES		CONSTRUCTION MATERIAL	
SEPTIC TANK ABSORPTION FIELDS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK, SLOPE	ROADFILL	0-25%: POOR-THIN LAYER, AREA RECLAIM 25+%: POOR-THIN LAYER, AREA RECLAIM, SLOPE
SEWAGE LAGOON AREAS	0-7%: SEVERE-DEPTH TO ROCK, SEEPAGE 7+%: SEVERE-DEPTH TO ROCK, SEEPAGE, SLOPE	SAND	UNSUITED
SANITARY LANDFILL (TRENCH)	0-25%: SEVERE-DEPTH TO ROCK, SEEPAGE 25+%: SEVERE-DEPTH TO ROCK, SEEPAGE, SLOPE	GRAVEL	UNSUITED
SANITARY LANDFILL (AREA)	0-15%: SEVERE-SEEPAGE 15+%: SEVERE-SLOPE, SEEPAGE	TOPSOIL	0-15%: POOR-LARGE STONES, SMALL STONES 15+%: POOR-LARGE STONES, SMALL STONES, SLOPE
DAILY COVER FOR LANDFILL	0-12%: POOR-AREA RECLAIM 15+%: POOR-SLOPE, AREA RECLAIM	WATER MANAGEMENT	
		POND RESERVOIR AREA	0-6%: DEPTH TO ROCK, SEEPAGE 6+%: SEEPAGE, DEPTH TO ROCK, SLOPE
BUILDING SITE DEVELOPMENT			
SHALLOW EXCAVATIONS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK, SLOPE	EMBANKMENTS DIKES AND LEVEES	LARGE STONES, THIN LAYER
DWELLINGS WITHOUT BASEMENTS	0-8%: MODERATE-DEPTH TO ROCK 8-15%: MODERATE-DEPTH TO ROCK, SLOPE 15+%: SEVERE-SLOPE	EXCAVATED PONDS AQUIFER FED	NO WATER
DWELLINGS WITH BASEMENTS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK, SLOPE	DRAINAGE	NOT NEEDED
SMALL COMMERCIAL BUILDINGS	0-4%: MODERATE-DEPTH TO ROCK 4-8%: MODERATE-DEPTH TO ROCK, SLOPE 8+%: SEVERE-SLOPE	IRRIGATION	0-6%: ROOTING DEPTH, LARGE STONES 6+%: ROOTING DEPTH, LARGE STONES, SLOPE
LOCAL ROADS AND STREETS	0-8%: MODERATE-DEPTH TO ROCK 8-15%: MODERATE-SLOPE, DEPTH TO ROCK 15+%: SEVERE-SLOPE	TERRACES AND DIVERSIONS	0-12%: DEPTH TO ROCK, LARGE STONES 12+%: DEPTH TO ROCK, LARGE STONES, SLOPE
LAWNS, LANDSCAPING AND FAIRWAYS	0-15%: SEVERE-LARGE STONES, SMALL STONES 15+%: SEVERE-LARGE STONES, SMALL STONES, SLOPE	GRASSED WATERWAYS	0-8%: LARGE STONES, DEPTH TO ROCK 8+%: SLOPE, LARGE STONES, DEPTH TO ROCK

REGIONAL INTERPRETATIONS	
PASTURE AND MAYLAND	2-12%: GROUP 9 12-18%: GROUP 10 18+%: GROUP 11

RECREATIONAL DEVELOPMENT			
CAMP AREAS	0-8%: MODERATE-LARGE STONES, SMALL STONES 8-15%: MODERATE-SLOPE, LARGE STONES, SMALL STONES 15+%: SEVERE-SLOPE	PLAYGROUNDS	0-6%: SEVERE-SMALL STONES 6+%: SEVERE-SLOPE, SMALL STONES
PICNIC AREAS	0-8%: MODERATE-LARGE STONES, SMALL STONES 8-15%: MODERATE-SLOPE, LARGE STONES, SMALL STONES 15+%: SEVERE-SLOPE	PATHS AND TRAILS	0-15%: MODERATE-SMALL STONES 15-25%: MODERATE-SLOPE, SMALL STONES 25+%: SEVERE-SLOPE

[illegible]

WOODLAND SUITABILITY									
CLASS- DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS				POTENTIAL PRODUCTIVITY			
		EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINOTH. HAZARD	PLANT COMPET.	COMMON TREES	SITE INDX	TREES TO PLANT
0-18%	30	SLIGHT	SLIGHT	SLIGHT	SLIGHT	SLIGHT	RED PINE	55	RED PINE
18+%	3R	MODERATE	MODERATE	SLIGHT	SLIGHT		EASTERN WHITE PINE	50	JACK PINE
							JACK PINE	60	
							QUAKING ASPEN	65	
							PAPER BIRCH	60	

CLASS-DETERMINING PHASE			WINDBREAKS (A)		SPECIES		SPECIES	
	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	NONE							

CLASS- DETERMINING PHASE	WILDLIFE HABITAT SUITABILITY											
	POTENTIAL FOR HABITAT ELEMENTS							POTENTIAL AS HABITAT FOR:				
	GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWO TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	OPENLD	WOODLD	WETLAND	RANGEL
ALL	POOR	POOR	FAIR	FAIR	FAIR	-	V. POOR	V. POOR	POOR	FAIR	V. POOR	-

[illegible]

MO195

SOIL SURVEY INTERPRETATIONS

MLPA(5): 29. 90
REV. AEJ:AMH. 9-75
LITHIC CYSTOCHEPES. LOAMY. MIXED. FRIGID

INSULA SERIES

THE INSULA SERIES CONSISTS OF WELL DRAINED SOILS FORMED IN GLACIAL TILL OVERLYING BEDROCK ON UPLANDS. THE SURFACE LAYER IS GRAY GRAVELLY SANDY LOAM 3 INCHES THICK UNDERLYING ORGANIC LITTER. THE UPPER SUBSOIL IS DARK YELLOWISH-BROWN AND DARK BROWN GRAVELLY SANDY LOAM 6 INCHES THICK. THE LOWER SUBSOIL IS BROWN AND LIGHT CLIVE BROWN GRAVELLY SANDY LOAM 6 INCHES THICK. THE UNDERLYING MATERIAL IS GRANITE BEDROCK. SLOPES RANGE FROM 2 TO 35 PERCENT. MOST AREAS ARE IN FOREST.

ESTIMATED SOIL PROPERTIES										
DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	PERCENT OF MATERIAL LESS (3 IN) THAN 20 PASSING SIEVE NO. 100					LIQUID LIMIT	PLAS- TICITY INDEX
0-15 15	GR-SL UWB	SM. GM	A-2. A-4. A-1-B	10-30	15-60	40-60	30-70	15-50	<20	MP-4
DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK- SWELL POTENTIAL	CORROSIVITY STEEL	EROSION CONCRETE	WIND EACI285	WIND EROC.	GROUP
0-15 15	2.0-6.0	0.09-0.14	4.5-6.5	-	LOW	LOW	MODERATE	1-17	2	3
FLOODING			HIGH WATER TABLE			CEMENTED PAN		BEDROCK		SUBSIDENCE
FREQUENCY	DURATION	MONTHS	DEPTH (FT)	KIND	MONTHS	DEPTH (IN)	HARDNESS	DEPTH (IN)	HARDNESS	INIT. TOTAL GRP
NONE			26.0			-		2-20	HARD	1-2 MODERATE

SANITARY FACILITIES			SOURCE MATERIAL	
SEPTIC TANK ABSORPTION FIELDS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK.SLOPE	ROADFILL	POOR-THIN LAYER.LARGE STONES.SMALL STONES	
SEWAGE LAGOON AREAS	0-7%: SEVERE-DEPTH TO ROCK 7+%: SEVERE-DEPTH TO ROCK.SLOPE	SAND	UNSUITED	
SANITARY LANDFILL (TRENCH)	0-25%: SEVERE-DEPTH TO ROCK 25+%: SEVERE-DEPTH TO ROCK.SLOPE	GRAVEL	UNSUITED	
SANITARY LANDFILL (AREA)	0-15%: SEVERE-SEEPAGE 15+%: SEVERE-SEEPAGE.SLOPE	TOPSOIL	POOR-LARGE STONES.THIN LAYER.SMALL STONES	
DAILY COVER FOR LANDFILL	0-15%: POOR-THIN LAYER 15+%: POOR-THIN LAYER.SLOPE	POND RESERVOIR AREA	WATER MANAGEMENT	
			DEPTH TO ROCK	
COMMUNITY DEVELOPMENT				
SHALLOW EXCAVATIONS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK.SLOPE	EMBANKMENTS DIKES AND LEVEES	LARGE STONES.THIN LAYER.SEEPAGE	
DWELLINGS WITHOUT BASEMENTS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK.SLOPE	EXCAVATED POND AQUIFER FED	NO WATER	
DWELLINGS WITH BASEMENTS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK.SLOPE	DRAINAGE	NOT NEEDED	
SMALL COMMERCIAL BUILDINGS	0-8%: SEVERE-DEPTH TO ROCK 8+%: SEVERE-DEPTH TO ROCK.SLOPE	IRRIGATION	0-6%: ROOTING DEPTH 6+%: ROOTING DEPTH.SLOPE	
LOCAL ROADS AND STREETS	0-75%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK.SLOPE	TERRACES AND DIVERSIONS	ROOTING DEPTH	
LAWNS. LANDSCAPING AND GOLF FAIRWAYS		GRASSED WATERWAYS	ROOTING DEPTH	

REGIONAL INTERPRETATIONS	
PASTURE AND MAY	2-12%: GROUP 9 12-18%: GROUP 10 18+%: GROUP 11

CAMP AREAS		PLAYGROUNDS	
0-8X: MODERATE-LARGE STONES	0-6X: SEVERE-DEPTH TO ROCK	8-15X: MODERATE-LARGE STONES.SLOPE	6+X: SEVERE-DEPTH TO ROCK.SLOPE
15+X: SEVERE-SLOPE			
PICNIC AREAS		PATHS AND TRAILS	
0-8X: MODERATE-LARGE STONES	0-15X: SLIGHT	8-15X: MODERATE-LARGE STONES.SLOPE	15-25X: MODERATE-SLOPE
15+X: SEVERE-SLOPE			25+X: SEVERE-SLOPE

CLASS- DETERMINING PHASE	CAPABILITY AND PRELIMINARY YIELDS -- CROPS AND FORAGE -- PLANT LEVEL -- HAYSTACKS --									
	CAPA- BILITY	GRASS- LEGUME HAY (TONS)	KENTUCKY BLUEGRASS (AUM)							
	N18R 18R	N18R 18R	N18R 18R	N18R 18R	N18R 18R	N18R 18R	N18R 18R	N18R 18R	N18R 18R	N18R 18R
0-18%	6E	3.0	2.5							
18-35%	7E	-	-							

CLASS- DETERMINING PHASE		ORD SYM	MANAGEMENT PROBLEMS				POTENTIAL PRODUCTIVITY			TREES TO PLANT
			EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	IMPORTANT TREES	SITE INDEX	
0-16%		3D	SLIGHT	SLIGHT	MODERATE	MODERATE	SLIGHT	RED PINE	55	RED PINE
16-+		3D	MODERATE	MODERATE	SEVERE	MODERATE	SLIGHT	EASTERN WHITE PINE	50	JACK PINE
								JACK PINE	60	
								QUAKING ASPEN	65	
								PAPER BIRCH	60	

[illegible][illegible][illegible]

MN0228

SOIL INTERPRETATIONS RECORD

NEWFOUND SERIES

MLRA(S): 89, 90

REV. AEJ,RHM, 11-77

TYPIC FRAGIOCHREPTS, COARSE-LOAMY, MIXED, FRIGID

THE NEWFOUND SERIES CONSISTS OF WELL-DRAINED SOILS FORMED IN GLACIAL TILL ON UPLANDS. THE SUBSURFACE IS GRAYISH-BROWN GRAVELLY SANDY LOAM, 5 INCHES THICK, UNDERLYING 2 1/4 INCHES OF DECOMPOSED PLANT REMAINS. THE SUBSOIL IS YELLOWISH-BROWN, DARK BROWN, LIGHT YELLOWISH-BROWN, AND PALE BROWN GRAVELLY SANDY LOAM, 27 INCHES THICK. THE UNDERLYING MATERIAL IS YELLOWISH-BROWN GRAVELLY SANDY LOAM. SLOPES RANGE FROM 0 TO 20 PERCENT. MOST AREAS ARE IN FOREST.

ESTIMATED SOIL PROPERTIES														
DEPTH (IN.)	USDA TEXTURE			UNIFIED		AASHTO		PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO.				LIQUID LIMIT	PLAS- TICITY INDEX	
								4	10	40	200			
0-16	GR-SL	GR-FSL	GR-SIL	SM	ML, GM	A-2, A-4	5-15	55-85	50-77	30-65	25-55	12-20	NP-4	
16-60	GR-SL	GR-FSL	GR-SIL	SM	ML, GM	A-2, A-4	5-15	55-85	50-77	30-65	25-55	12-20	NP-4	
DEPTH (IN.)	CLAY (PCT)	MOIST BULK DENSITY (G/CM ³)	PERMEA- BILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK- SWELL POTENTIAL	EROSION FACTORS	WIND EROD. GROUP	ORGANIC MATTER (PCT)	CORROSIVITY			
											STEEL	CONCRETE		
0-16	?	?	2.0-6.0	0.10-0.14	4.5-6.0	-	LOW	.15	2	8	?	LOW		
16-60			0.06-0.2	0.05-0.09	4.5-6.0	-	LOW	.15				MODERATE		
FLOODING				HIGH WATER TABLE			CEMENTED PAN		BEDROCK		SUBSIDENCE		HYD	POTENTIAL
				DEPTH (FT)	KIND	MONTHS	DEPTH (IN)	HARDNESS	DEPTH (IN)	HARDNESS	INIT. (IN)	TOTAL (IN)	GRP	FROST ACTION
NONE				26.0			-		260		-		C	MODERATE

SANITARY FACILITIES		CONSTRUCTION MATERIAL	
SEPTIC TANK ABSORPTION FIELDS	0-15%: SEVERE-PERCS SLOWLY 15+%: SEVERE-PERCS SLOWLY,SLOPE	ROADFILL	0-15%: FAIR-LOW STRENGTH 15-20%: FAIR-SLOPE,LOW STRENGTH
SEWAGE LAGOON AREAS	0-2%: SLIGHT 2-7%: MODERATE-SLOPE 7+%: SEVERE-SLOPE	SAND	POOR-EXCESS FINES
SANITARY LANDFILL (TRENCH)	SLIGHT	GRAVEL	POOR-EXCESS FINES
SANITARY LANDFILL (AREA)	0-8%: SLIGHT 8-15%: MODERATE-SLOPE 15+%: SEVERE-SLOPE	TOPSOIL	0-15%: POOR-SMALL STONES 15+%: POOR-SMALL STONES,SLOPE
DAILY COVER FOR LANDFILL	0-8%: FAIR-SMALL STONES 8-15%: FAIR-SMALL STONES,SLOPE 15+%: POOR-SLOPE	WATER MANAGEMENT	
		POND RESERVOIR AREA	2-6%: FAVORABLE 6+%: SLOPE
BUILDING SITE DEVELOPMENT			
SHALLOW EXCAVATIONS	0-8%: SLIGHT 8-15%: MODERATE-SLOPE 15+%: SEVERE-SLOPE	EMBANKMENTS DIKES AND LEVEES	PIPING
DWELLINGS WITHOUT BASEMENTS	0-8%: SLIGHT 8-15%: MODERATE-SLOPE 15+%: SEVERE-SLOPE	EXCAVATED PONDS AQUIFER FED	NO WATER
DWELLINGS WITH BASEMENTS	0-8%: SLIGHT 8-15%: MODERATE-SLOPE 15+%: SEVERE-SLOPE	DRAINAGE	NOT NEEDED
SMALL COMMERCIAL BUILDINGS	0-4%: SLIGHT 4-8%: MODERATE-SLOPE 8+%: SEVERE-SLOPE	IRRIGATION	ROOTING DEPTH,DROUGHTY,PERCS SLOWLY
LOCAL ROADS AND STREETS	0-8%: MODERATE-FROST ACTION,LOW STRENGTH 8-15%: MODERATE-SLOPE,FROST ACTION, LOW STRENGTH 15+%: SEVERE-SLOPE	TERRACES AND DIVERSIONS	0-12%: ROOTING DEPTH,PERCS SLOWLY 12+%: SLOPE,ROOTING DEPTH,PERCS SLOWLY
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	0-15%: SEVERE-SMALL STONES 15+%: SEVERE-SMALL STONES,SLOPE	GRASSED WATERWAYS	0-8%: DROUGHTY,ROOTING DEPTH 8+%: DROUGHTY,SLOPE,ROOTING DEPTH

REGIONAL INTERPRETATIONS	
PASTURE AND MAYLAND	2-12%: GROUP 9 12+%: GROUP 10

DEC 28 1977

RECREATIONAL DEVELOPMENT			
CAMP AREAS	0-8%: MODERATE-SMALL STONES, PERCS SLOWLY 8-15%: MODERATE-SLOPE, SMALL STONES, PERCS SLOWLY 15+%: SEVERE-SLOPE	PLAYGROUNDS	0-6%: SEVERE-SMALL STONES 6+%: SEVERE-SLOPE, SMALL STONES
PICNIC AREAS	0-8%: MODERATE-SMALL STONES 8-15%: MODERATE-SLOPE, SMALL STONES 15+%: SEVERE-SLOPE	PATHS AND TRAILS	0-15%: MODERATE-SMALL STONES 15-20%: MODERATE-SLOPE, SMALL STONES

[illegible]

		WOODLAND SUITABILITY					POTENTIAL PRODUCTIVITY		
CLASS- DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS					COMMON TREES	SITE INDEX	TREES TO PLANT
		EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.			
0-12%	2D	SLIGHT	SLIGHT	MODERATE	MODERATE	MODERATE	RED PINE	60	RED PINE
12+%	2D	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE	EASTERN WHITE PINE	60	WHITE SPRUCE
							JACK PINE	64	
							WHITE SPRUCE	59	
							QUAKING ASPEN	75	

CLASS-DETERMINING PHASE	WINDBREAKS			
	SPECIES	HT	SPECIES	HT
NONE				

CLASS- DETERMINING PHASE	WILDLIFE HABITAT SUITABILITY										POTENTIAL AS HABITAT FOR:			
	POTENTIAL FOR HABITAT ELEMENTS													
	GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	OPENLD WILDLF	WOODLD WILDLF	WETLAND WILDLF	RANGELD WILDLF		
ALL	POOR	POOR	FAIR	FAIR	FAIR	-	V. POOR	V. POOR	POOR	FAIR	V. POOR	-		

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)						
COMMON PLANT NAME	PLANT SYMBOL (N. SPN.)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE				
POTENTIAL PRODUCTION (LBS./AC. DRY WT.):						
FAVORABLE YEARS						
NORMAL YEARS						
UNFAVORABLE YEARS						

22

MN0202

SOIL INTERPRETATIONS RECORD

QUETICQ SERIES

MLRA(S): 89, 90
 REV. AEJ:RMH, 6-79
 LITHIC UDORTHENTS, LOAMY, MIXED, ACID, FRIGID

THE QUETICQ SERIES CONSISTS OF SOMEWHAT EXCESSIVELY DRAINED SOILS FORMED IN GLACIAL MATERIAL OVERLYING BEDROCK ON UPLANDS. THE SURFACE LAYER IS DARK BROWN AND STRONG BROWN LUAM 5 INCHES THICK UNDERLYING FOREST LITTER. THE UNDERLYING MATERIAL IS BEDROCK. SLOPES RANGE FROM 5 TO 35 PERCENT. MOST AREAS ARE IN FOREST.

ESTIMATED SOIL PROPERTIES												
DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT >3 IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO.					LIQUID LIMIT	PLAS- TICITY INDEX	
0-5 S	L UNB	CL, ML	A-4	2-15	75-100	70-95	60-90	55-85		20-30	3-10	
DEPTH (IN.)	CLAY (PCT <2MM)	MOIST DENSITY (G/CM3)	BULK DENSITY (G/CM3)	PERMEA- BILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK- SWELL POTENTIAL	EROSION FACTORS K T	WIND EROD. GROUP I	ORGANIC MATTER (PCT)	CORROSIVITY STEEL CONCRETE
0-5 S				0.6-2.0	0.20-0.22	4.5-5.5	-	LOW	32	1	8	LOW MODERATE
FLOODING			HIGH WATER TABLE			CEMENTED PAN		BEDROCK		SUBSIDENCE		HYD POTENTIAL
FREQUENCY	DURATION	MONTHS	DEPTH (FT)	KIND	MONTHS	DEPTH (IN)	HARDNESS	DEPTH (IN)	HARDNESS	INIT. (IN)	TOTAL (IN)	FROST ACTION
NONE			>6.0			-		4-8	HARD	-		0 LOW

SANITARY FACILITIES				CONSTRUCTION MATERIAL			
SEPTIC TANK ABSORPTION FIELDS	5-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK, SLOPE		ROADFILL	5-25%: POOR-AREA RECLAIM 25+%: POOR-AREA RECLAIM, SLOPE			
SEWAGE LAGOON AREAS	5-7%: SEVERE-DEPTH TO ROCK 7+%: SEVERE-DEPTH TO ROCK, SLOPE		SAND	IMPROBABLE-EXCESS FINES			
SANITARY LANDFILL (TRENCH)	5-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK, SLOPE		GRAVEL	IMPROBABLE-EXCESS FINES			
SANITARY LANDFILL (AREA)	5-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK, SLOPE		TOPSOIL	5-15%: POOR-AREA RECLAIM, SMALL STONES 15+%: POOR-AREA RECLAIM, SMALL STONES, SLOPE			
DAILY COVER FOR LANDFILL	5-15%: POOR-AREA RECLAIM 15+%: POOR-AREA RECLAIM, SLOPE		POND RESERVOIR AREA	WATER MANAGEMENT			
				5-8%: SEVERE-DEPTH TO ROCK 8+%: SEVERE-DEPTH TO ROCK, SLOPE			
BUILDING SITE DEVELOPMENT							
SHALLOW EXCAVATIONS	5-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK, SLOPE		EMBANKMENTS DIKES AND LEVEES	SLIGHT			
DWELLINGS WITHOUT BASEMENTS	5-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-SLOPE, DEPTH TO ROCK		EXCAVATED PONDS AQUIFER FED	SEVERE-NO WATER			
DWELLINGS WITH BASEMENTS	5-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK, SLOPE		DRAINAGE	DEEP TO WATER			
SMALL COMMERCIAL BUILDINGS	5-8%: SEVERE-DEPTH TO ROCK 8+%: SEVERE-SLOPE, DEPTH TO ROCK		IRRIGATION	DEPTH TO ROCK, SLOPE			
LOCAL ROADS AND STREETS	5-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK, SLOPE		TERRACES AND DIVERSIONS	5-8%: DEPTH TO ROCK 8+%: SLOPE, DEPTH TO ROCK			
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	5-15%: SEVERE-THIN LAYER 15+%: SEVERE-SLOPE, THIN LAYER		GRASSED WATERWAYS	5-8%: DEPTH TO ROCK 8+%: SLOPE, DEPTH TO ROCK			

REGIONAL INTERPRETATIONS	
PASTURE AND HAY	GROUP 11

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RECREATIONAL DEVELOPMENT

RECREATIONAL DEVELOPMENT			
CAMP AREAS	5-15%: SEVERE-DEPTH TO ROCK 15+X: SEVERE-SLOPE,DEPTH TO ROCK	PLAYGROUNDS	5-6X: SEVERE-SMALL STONES,DEPTH TO ROCK 6+X: SEVERE-SLOPE,SMALL STONES,DEPTH TO ROCK
PICNIC AREAS	5-15%: SEVERE-DEPTH TO ROCK 15+X: SEVERE-SLOPE,DEPTH TO ROCK	PATHS AND TRAILS	5-15%: SLIGHT 15-25%: MODERATE-SLOPE 25+X: SEVERE-SLOPE

CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

[illegible]

WOODLAND SUITABILITY

CLASS- DETERMINING PHASE	ORD SYN	MANAGEMENT PROBLEMS					POTENTIAL PRODUCTIVITY		TREES TO PLANT
		EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINOTH. HAZARD	PLANT COMPET.	COMMON TREES	SITE INDEX	
ALL	50	SEVERE	SEVERE	MODERATE	SEVERE	SLIGHT	EASTERN WHITE PINE	<40	JACK PINE
							RED PINE	<40	
							JACK PINE	<40	
							QUAKING ASPEN	<40	
							PAPER BIRCH	<40	

WINDBREAKS (A)

CLASS-DETERMIN'G PHASE	SPECIES		WINDBREAKS (A)		SPECIES		SPECIES	
	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
NONE								

WILDLIFE HABITAT SUITABILITY

CLASS- DETERMINING PHASE	WILDLIFE HABITAT SUITABILITY										POTENTIAL AS HABITAT FOR:			
	POTENTIAL FOR HABITAT ELEMENTS													
	GRAIN & SEED	GRASS & LEGUME	WILD HERB	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	OPENLD WILDLF	WOODLD WILDLF	WETLAND WILDLF	RANGELND WILDLF		
ALL	V. POOR	POOR	POOR	POOR	POOR	-	V. POOR	V. POOR	POOR	POOR	V. POOR	-		

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)					
COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE			
POTENTIAL PRODUCTION (LBS./AC. DRY WT.):					
FAVORABLE YEARS					
NORMAL YEARS					
UNFAVORABLE YEARS					

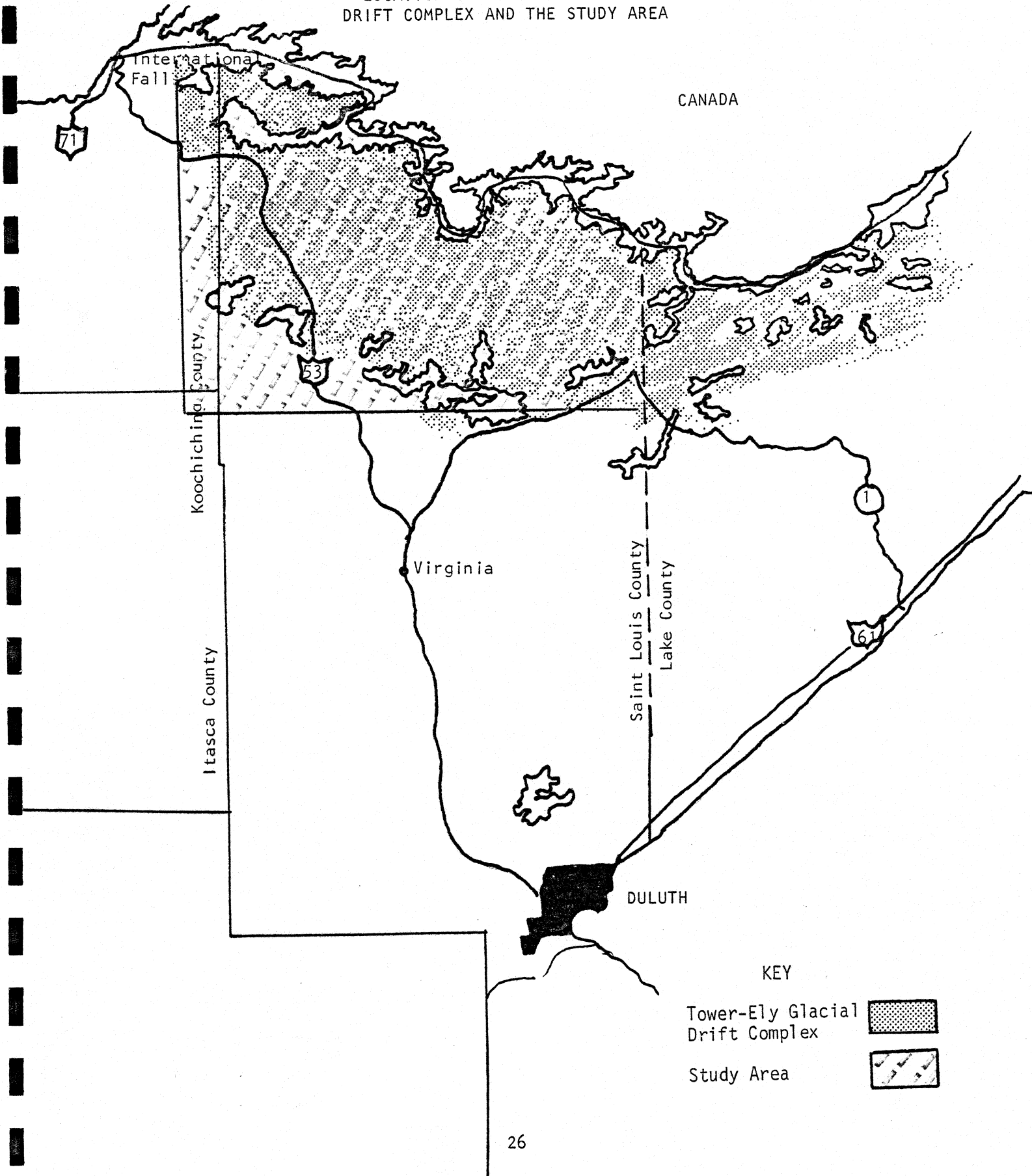
FOOTNOTES

signifies bedrock. The second letter refers to the texture of material above five feet. In the study area an L or S stands for loam or silty. The third letter refers to the degree of drainage, with the W indicating well drained. The fourth letter represents the color of the surface soil, with the L designating a light colored soil. These landscape units are collected as large groupings such as the Tower-Ely and are referred to as geomorphic units. They illustrate the broad physiographic features and provide identification of the materials on which the soils have developed. Exhibit 1 is reproduced from the International Falls Field Sheet, although portions of the study area also fall in the Hibbing and Two Harbors Field Sheets, these have not yet been released to the public. Exhibit 1 serves to represent these sheets and shows the pervasiveness of the Tower-Ely complex within the area. The dominance of the Tower-Ely Glacial Drift (19) in the study area is illustrated in Exhibit 5. Exhibit 4 is a descriptor from the Minnesota Soil Atlas Miscellaneous Report describing the Tower-Ely complex with specific references to the Hibbing Field Sheet. The RLWL landscape unit is demonstrated to have seven major soil types from Table 9 in the description of the landscape unit in this report. These major soil types are the Mesaba, Insula, Newfound, and Quetico, comprising 70 percent of the unit, and the Conic, Barto, and Toivola soils, comprising 30 percent of the unit.

All of the seven major soils in the series produce severe limitations to various forms of development. Selected characteristics of these soils are illustrated in Table 10 in Exhibit 4. County ordinances state acceptable permeability to be .1 to 60 minutes per inch for septic systems. A conversion to inches per hour gives a fastest allowable rate of 600 inches per hour to a slowest allowable rate of 1 inch per hour. The ranges of permeability displayed in Table 10 of Exhibit 4 suggest that three of the soil types may be beyond the acceptable rate. However, it is the combination of slow permeability and nearness to bedrock that cause the severe limitations to development. University of Minnesota Extension Folder 261, Revised

EXHIBIT 5

LOCATION OF TOWER-ELY GLACIAL
DRIFT COMPLEX AND THE STUDY AREA



1977, states, "If you encounter the water table or an impervious layer (rock or clay) at 3 feet or less, the area is not suitable for a standard subsurface soil treatment field." As can be seen, five of the soils have bedrock within 5 to 30 inches of the surface, thus severely limiting septic tank and filter fields. Six have limitations for shallow excavations with the seventh having severe limitations only in slopes over 15 percent. The limitations for dwelling units without basements and for uses of the soil for the construction of local roads and streets are again severe to slight. The slopes in the study area range from 0 to 60 percent. The soils and their underlying bedrock are generally significant constraints to the development of subdivisions and dwelling units within the study area.

The Final Environmental Statement for Voyageurs National Park classifies the soils of the park into two major groups and states relative to the soil adaptability for development "Two major constraints to development exist. Neither soil association is even marginally suitable for septic systems. Construction on poorly drained soils is not desirable."²

Groundwater availability in the study area also serves as a constraint to future development. The groundwater in the Rainy River Basin of the study area is obtained from the glacial drift except where the drift is thin or lacking in permeable material. Exhibit 6 is a map and summary of groundwater conditions within the Rainy River Basin. The publication Groundwater Resources in Minnesota states "in general, the potential for obtaining additional water from the bedrock is poor because of a random occurrence and low instance of bedrock fractures."³ As can be seen from

²Page 50 of the Final Environmental Impact Statement for Voyageurs National Park, by the U.S. Department of the Interior.

³Page 16 of the Groundwater Resources in Minnesota, by the Minnesota Department of Natural Resources, Division of Waters.

GROUNDWATER CONDITIONS IN THE STUDY AREA FROM GROUNDWATER RESOURCES IN MINNESOTA

Table 2.—Summary of ground-water conditions in the Rainy River basin

	Aquifer	Occurrence and lithology	Thickness, in feet	Yield to individual wells, in gallons per minute	Water quality	Present and potential development	Problems
Glacial drift	Surficial outwash	Beach ridges--linear deposits of fine to coarse sand and gravel.	Most less than 10. Up to 90 on "Beltrami Island."	Usually less than 10. Several hundred possible on "Beltrami Island."	Dissolved-solids concentration and total hardness less than 200 mg/l. High iron and manganese.	Slightly developed, undeveloped parts will support additional development, especially "Beltrami Island."	Wells in beach ridges may go dry in summer. Easily contaminated.
		Outwash and ice contact--mostly highly irregular topography and many lakes, medium to coarse sand and gravel.	Most 10-40. Maximum 120.	Usually less than 50. Several hundred possible in some areas.	Dissolved-solids concentration and total hardness less than 200 mg/l. High iron and manganese.	Slightly developed, most around lakes will support considerable additional development.	Easily contaminated. Extensive development will lower lake levels and decrease streamflow.
	Buried outwash	Itasca County: Lenses in till, fine to coarse sand and gravel.	Most less than 10. May be several 10's of feet.	Commonly less than 10, 100-300 in some areas.	Dissolved solids usually less than 500 mg/l, maximum 1,000 mg/l, highest near Rainy River; hardness usually greater than 200 mg/l, maximum 600 mg/l. Dissolved solids and hardness least in southern and eastern parts. High iron and manganese.	Slightly developed, most along southern border and Rainy River. Will support additional development at least for domestic supplies.	Requires extensive test drilling to locate large supply. High hydraulic head, if unexpected, complicates well completion; unchecked flowing wells needlessly deplete resource.
		Elsewhere undefined lenses in till	Variable.	Variable.		Slightly developed, will support additional wells.	Delineation requires test drilling.
Bedrock	Cretaceous	Sandstone	Unknown.			Very limited occurrence. Not a reliable source.	
	Precambrian basaltic lava flows	Fractured basalt and interflow sediments.	Thousands.	Unknown in basin.		Unknown in basin.	
	Precambrian iron formation	Magnetite iron lenses, fractured and leached ferruginous chert.	Up to 800.	Unknown in basin.		Unknown in basin.	
	Other Precambrian (Usually not considered as aquifers but listed here, for in some areas it is only possible source of water)	Igneous and metamorphic rocks, granite, gneiss, slate, etc. Water occurs in fractures.	Unknown.	Usually less than 5.	Similar to that in overlying drift. Lower iron and manganese.	Very slightly developed. Unreliable source.	Unpredictable, may require deep well with at best a minimum supply.

EXHIBIT 6

Table 2, reproduced in Exhibit 6, the yield to individual wells, present and potential development, and special problems in the area all suggest possible complications in obtaining groundwater.

The Environmental Impact Statement for Voyageurs states,

Groundwater resources in the park are very limited due to the shallow soils and bedrock conditions. Groundwater yields of less than 10 gallons/minute from glacial drift and less than 5 gallons/minute from fractured bedrock zones may be obtained locally, but the low incidence and random occurrence of suitable sites and the availability of high quality surface water makes the potential for groundwater development low (Minnesota Department of Natural Resources, 1976). Since groundwaters are the preferred source for water supply development, studies will be conducted at primary park developments and wells will be provided wherever safe, adequate groundwater supplies exist.

Results from recent and ongoing water quality monitoring programs (EPA, 1979; Payne, 1979) indicate water quality is generally good throughout the region. Iron and manganese concentrations often exceed currently applicable National Secondary Drinking Water Standards (and corresponding state standards) of 0.3 mg/l and 0.05 mg/l respectively, but no health hazards are involved. Fecal coliform counts exceed the currently applicable (IB) standard of 10 organisms per 100 ml on occasion, especially proximal to developed areas or resorts and private residences with inadequate sewage systems. Since all drinking water comes from the lakes or shallow wells, localized health hazards probably exist. Inspection and periodic monitoring efforts within park boundaries are currently underway to ensure compliance with all state and federal health standards.⁴

⁴Page 55-56 of the Final Environmental Impact Statement for Voyageurs National Park, by the U.S. Department of the Interior.

LEGAL AND POLITICAL CONSTRAINTS

Today, whether in northern Minnesota or in the more dynamic growth areas of California or Texas, developing a subdivision is no longer a matter of merely hiring a surveyor or engineer to produce a plat and then selling off the lots created. There are within any jurisdiction a number of ordinances, laws, administrative rulings, and statutes which govern subdivision platting. There follows a discussion of the appropriate federal, state, and local regulations which affect the platting and subdivision of land.

On the federal level, the Interstate Land Sales Full Disclosure Act, effective in April of 1969, along with several subsequent amendments, the latest of which was in late 1979, would affect potential subdivisions in the study area. This act is implemented through the Office of Interstate Land Sales Registration (OILSR) of the U.S. Department of Housing and Urban Development (HUD). The act applies to lot sale programs within the study area of 25 or more lots, offered pursuant to a common promotional plan where any means or instruments of interstate transportation or communication or mails are used to sell or lease lots.

Although there are some exemptions available which may either provide full or partial exemption from this act, a subdivision of 25 or more lots would come under the scope of the act. Any subdivision of 25 or more lots should be analyzed in terms of registration within this act and determining the act's applicability would require careful study and probably legal counsel. If the subdivision does indeed require registration with OILSR, the developer would be faced with a multitude of requirements and regulations; among them being registration fees, preparation of various legal documents and descriptive documents for submission to HUD, specially prepared prospectuses for possible purchasers, annual reporting obligations and the like. The act and its amendments are a complicated affair, and for subdivisions of more than 25 lots the conforming requirements would be costly and take three to nine months to implement.

The following state statutes and regulations are required or mandate compliance for certain portions or occurrences of subdivision. Chapter 505 of the Minnesota statutes outlines general platting procedures and delegates authority to the counties. All platting specifications and procedures are left up to the local county governing bodies. Chapter 394, "Building and Planning Commission", delegates authority to the county and outlines general procedures that are necessary for platting requirements. Chapter 83 of the statutes, revised in 1978, entitled "Subdivided Lands," outlines registration procedures for subdivided land, defined by the statute as "any land wherever located, improved or unimproved, whether adjacent or not, which is divided or proposed to be divided for the purpose of disposition pursuant to a common promotional scheme or plan of advertising and disposition by a single subdivider or group of subdividers." Minnesota Conservation Regulation 70-77 entitled "State-wide Standards and Criteria for Management of Shoreline Areas", governs when a property is within 1,000 feet of a shoreline or 300 feet of a river and details minimum standards for platting and building. This regulation requires a submission of the proposed plat and review and approval by the Department of Natural Resources.

The following permits and registrations are required for subdivisions if all or portions of the subdivisions fall within the governing regulations because of size or location of the subdivision. An operating permit from the Environmental Quality Board is required if 50 or more lots are platted and if any of these lots abuts water. In this case, the proposed subdivision must be reviewed by the county and an impact statement of negative influence filed with the state Department of Natural Resources. The proposed subdivision is then open to public review for a period of thirty days. This requirement is pursuant to the Minnesota Environmental Policy Act of 1973. Minnesota Statute 105 requires a water appropriation permit for wells and plumbing systems from the state health department if the system services 10,000 gallons a day or 25 people a day. Regulation WPC40 requires a sewage disposal permit

from the Pollution Control Agency of the state of Minnesota for systems which serve 15 dwellings or 5,000 gallons per day. The preparation of a costly and time consuming environmental impact report, for submission to the Department of Natural Resources Division of Waters is required under conservation regulation 70-77 pursuant to issuing an operation permit for any proposed subdivision that will alter "the course, current, or a cross section of public water." Perhaps most applicable to subdivisions platted within the study area would be the requirement under chapter 83 of the 1978 statutes for registration of the subdivision with the Minnesota Security Commission if ten or more lots are platted; review for this registration would take from 60 to 180 days. Conservation regulation 70-77 requires an operating permit from the Division of Waters of the Department of Natural Resources for all proposed lakeshore cluster and condominium developments.

Both counties require certain procedures as set forth in governing ordinances to be followed in the platting of a subdivision. The subdivision platting regulations of Koochiching County, Minnesota, are reproduced in Exhibit 7. As can be seen in articles 3 and 4, there are a number of steps required for the submission of the preliminary plan and approval of the final plat. It requires that four sets of plans and plats be reviewed by the engineer and submitted to the county auditor, who in turn refers the plats to the land commissioner and health officer for review. Within thirty days they report back to the land commissioner. This preliminary plan is only tentative and an approval merely signifies general acceptability of the layout; nevertheless, 25 items are required in the ordinance for the preliminary plat. The final plat must be submitted along with an up-to-date abstract of title or certificate of title under the Torrens registration system. This plat is then reviewed by the auditor, plat commission surveyor, engineer, land commissioner, and county attorney. These reviews are for conformance to the state platting regulations and conformance to the design standards and engineering specifications set forth by the county. Additionally, information on water supply, sewage disposal,

EXHIBIT 7

THE SUBDIVISION PLATTING REGULATIONS OF KOOCHICHING COUNTY, MINNESOTA

SUBDIVISION PLATTING REGULATIONS
KOOCHICHING COUNTY, MINNESOTA

A RESOLUTION ESTABLISHING COMPREHENSIVE PLATTING REGULATIONS FOR THE LAYING OUT OF STREETS, ALLEYS AND OTHER PUBLIC GROUNDS AND THE SUBDIVISION OF LAND; ESTABLISHING THE REQUIREMENTS FOR THE APPROVAL OF SUBDIVISION PLATS WITHIN KOOCHICHING COUNTY, MINNESOTA, OUTSIDE THE INCORPORATED LIMITS OF CITIES AND VILLAGES, AND OUTSIDE AN AREA WITHIN A TWO MILE RADIUS OF THE CITY OF INTERNATIONAL FALLS, IN PURSUANCE OF THE AUTHORITY GRANTED BY STATE LAW.

WHEREAS, The Board of County Commissioners of Koochiching County has entered into a comprehensive planning and zoning program under provisions of Chapter 559, Laws of 1959, as amended by Chapter 692, Laws of 1963, and

WHEREAS, the following regulations have been recommended by the Koochiching County Planning Advisory Commission after a public hearing for the purpose stated below.

NOW, THEREFORE, BE IT RESOLVED, that the following regulations be adopted:

ARTICLE I- GENERAL PROVISIONS

101 Short Title. This resolution shall be known as the "Subdivision Platting Regulations of Koochiching County, Minnesota".

102 Purpose. Each new subdivision becomes a permanent unit in basic physical structure of the County, a unit to which in the future communities will of necessity be forced to adhere. In order that new subdivisions will contribute toward an attractive, orderly, stable and wholesome community environment, adequate public services, and safe streets, all subdivisions hereafter platted within the County shall fully comply with the regulations hereinafter set forth in this resolution.

103 Interpretation. In the interpretation and application, the provisions of this resolution shall be the minimum requirements adopted for the protection of the public health, safety and general welfare.

104 Scope. This resolution shall apply and be binding upon all of the area of Koochiching County, Minnesota, located outside the incorporated limits of cities and villages and outside an area within a two mile radius of the City of International Falls.

Except in the case of resubdivision, this resolution shall not apply to any lot or lots forming a part of a subdivision recorded in the office of the Register of Deeds prior to the effective date of this resolution, nor is it intended by this resolution to repeal, annul or in any way impair or interfere with existing provisions of other laws or resolutions except those specifically repealed by, or in conflict with, this resolution, or with private restrictions placed upon property by deed, covenant, or other private agreement, or with restrictive covenants running with the land. Where this resolution imposes a greater restriction upon the land than is imposed or required by such existing provisions of law, ordinance, contract or deed, the provisions of this resolution shall control.

105 Repeal of Existing Resolutions. All resolutions or parts of resolutions of the County in conflict with the provisions of this resolution are hereby repealed.

ARTICLE II - DEFINITIONS

Unless the context indicates a different meaning, for the purpose of this resolution certain words, phrases and terms shall be construed as follows:

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| 201 | PERSON | Any individual, firm, association, syndicate or partnership, corporation, trust, or any other legal entity. |
| 202 | SUBDIVISION
OF LAND
AND
SUBDIVIDE | <p>The division of a tract of land into two (2) or more lots or parcels for the purpose of transfer of ownership or building development, or, if a new street is involved, any division of a parcel of land; provided that the following shall <u>not</u> be deemed a subdivision:</p> <ul style="list-style-type: none">a. The division of a tract of land into lots or parcels of five (5) acres or more with a minimum width of 165 feet and not involving a new street.b. One (1) division of a tract of land into two (2) lots or parcels in any twelve month period of time provided that the resulting descriptions are approved by the Auditor.c. Transfers of interests in land by will or pursuant to court order. |
| 203 | SUBDIVIDER | The owner, agent, or person having control of such land as the term is used in this resolution. |
| 204 | COMMISSION | The Planning Advisory Commission of Koochiching County, Minnesota. |
| 205 | COUNTY | Koochiching County, Minnesota. |
| 206 | COUNTY
BOARD | The Koochiching County Board of Commissioners. |
| 207 | OFFICIAL
PLAN OR
COUNTY
PLAN | The Plan or plans for the orderly growth of Koochiching County as adopted and amended from time to time by the Planning Advisory Commission and the County Board. |
| 208 | STREET | A public way which affords primary means of access by pedestrians and vehicles to abutting properties, whether designated as a street, avenue, highway, road, boulevard, lane, or however otherwise designated. |
| 209 | THOROUGH-
FARE | A street of considerable length that carries, or that planning evidence indicates will carry, a large volume of traffic. Major and secondary thoroughfares are shown on the General County Plan. |
| 210 | COLLECTOR
STREET OR
ROAD | A street of relatively short length that serves as a connection between a thoroughfare and several minor streets. The term includes the principal entrance streets of a residential development and streets for major circulation within such a development. |
| 211 | MINOR
STREET | A street of relatively short length that provides direct access to a limited number of abutting properties. |
| 212 | CUL-DE-SAC | A permanent street terminating at one end without connecting with another street and designed so that it cannot be further extended without condemnation or taking property not dedicated as a street. |

213	MARGINAL ACCESS STREET	A street or service road parallel to and adjacent to a thoroughfare which provides access from the thoroughfare to abutting properties.
214	ALLEY	A public way used primarily as a service access to the rear or side of a property which abuts on a street.
215	PRIVATE STREET OR RESERVE STRIP	A purported street, way or strip of land reserved for the use of a limited number of persons or purposes as distinguished from a publicly dedicated street.
216	BLOCK	The distance as measured along a street between intersecting streets from center line to center line; and where the context requires, it also means the enclosed area within the perimeter of the streets or property lines enclosing it.
217	PUBLIC WALKWAY	A public way designed for the use of pedestrian traffic.
218	LOT	Any tract, including outlots, within a subdivision marked by the subdivider as a numbered tract to be offered as a unit of land for sale.
219	LOT WIDTH	The dimension of a lot measured on the building set back line.
220	SET BACK	The building set back line or distance as measured from the nearest street, road or water shoreline.
221	DRAINAGE COURSE	A water course or indenture for the drainage of surface waters.
222	SANITARY SEWER	A constructed conduit connected with a sewer system for the carrying of liquids and solids other than storm waters to a sanitary treatment plant.
223	STORM SEWER	A constructed conduit for carrying surface or ground waters to a drainage course.
224	PRELIMINARY PLAN	A drawing of a proposed subdivision or greater area prepared in the manner and containing the data, documents and information required by Article III of this resolution.
225	FINAL PLAT	The drawing of a subdivision prepared in the manner and containing the data, documents, and information required by Article IV of this resolution.
226	ATTORNEY	The County Attorney of Koochiching County, Minnesota, or his authorized representative.
227	AUDITOR	The County Auditor of Koochiching County, Minnesota, or his authorized representative.
228	ENGINEER	The County Highway Engineer of Koochiching County, Minnesota, or his authorized representative.

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| 229 | SURVEYOR | The County Surveyor of Koochiching County, Minnesota, or his authorized representative. |
| 230 | HEALTH OFFICER | The County Health Officer of Koochiching County, Minnesota, or his authorized representative. |
| 231 | LAND COMMISSIONER | The Land Commissioner of Koochiching County, Minnesota, or his authorized representative. |
| 232 | CLUSTER DEVELOPMENT | A subdivision development planned and constructed so as to group housing units into relatively tight patterns while providing a unified network of open space and wooded areas. |
| 233 | GROUP HOUSING | A housing project consisting of a group of five or more buildings constructed on a plot of ground three acres or more in size. |

ARTICLE III - PRELIMINARY PLAN

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| 301 | <u>Procedure for Preliminary Plan.</u> In order to familiarize himself with this resolution and related laws and to avoid costly revisions of plans and plats, the subdivider may have a preliminary discussion with the Engineer. | |
| 301-01 | The subdivider shall submit to the Auditor: | |
| 301-01-01 | Four copies of the preliminary plan. | |
| 301-01-02 | Application for approval of a plat, made in writing by the owner or his authorized agent. The application shall specify the location and size of the tract to be platted, the intent as to the character, type and use of the subdivided property and structures to be developed, the deed restrictions proposed, statement of mineral rights, and the extent and character of improvements to be made by the subdivider. | |
| 301-02 | The Auditor shall, upon receipt of preliminary plan, refer two copies to the Land Commissioner and one copy each to the Engineer and Health Officer. | |
| 301-03 | The Engineer and Health Officer shall within 30 days submit reports to the Commission. | |
| 301-04 | At the first regular meeting following receipt of the above reports and letter, the Commission shall determine whether such plan conforms to design standards set forth in this resolution and conforms to adopted County plans. The Commission may approve a preliminary plan subject to certain revisions. | |
| 301-05 | Approval of a preliminary plan by the Commission is tentative only, involving merely the general acceptability of the layout. Subsequent approval will be required of the engineering proposals outlined in Article IV. | |
| 301-06 | The action taken by the Commission shall be recorded in the proceedings of the Commission and transmitted to the applicant. | |

302 DATA REQUIRED FOR PRELIMINARY PLAN

- 302-01 The scale is one inch equal to 100 feet.
- 302-02 Identification and Description:
- 302-02-01 Proposed name of subdivision, which name shall not duplicate or be alike in pronunciation of the name of any plat theretofore recorded in the County. Short names are preferable.
- 302-02-02 Location by section, town, range, or by other legal description together with small-scale sketch showing location within the section.
- 302-02-03 Names and addresses of the owner, subdivider, surveyor and designer of the plan.
- 302-02-04 Graphic scale.
- 302-02-05 North-Point.
- 302-02-06 Date of preparation.
- 302-03 Existing conditions in the tract and in a reasonable area surrounding the tract.
- 302-03-01 Property lines.
- 302-03-02 Districts proposed for non-residential use.
- 302-03-03 Total acreage of proposed plat.
- 302-03-04 Platted streets, railroad right-of-way and utility easements.
- 302-03-05 Permanent buildings or other structures.
- 302-03-06 Location of existing sewers, water mains, culverts or other underground facilities.
- 302-04 Topography of platted area, showing lakes, water courses, swamp areas, and contours at vertical intervals to adequately portray the land form conditions. Contour lines shall be shown by means of dashed lines on the preliminary plan and where practical shall be numbered to acceptable Federal government datum.
- 302-05 Wood areas in outline only.
- 302-06 Other reasonable information, such as soil tests, if requested by the Engineer or Health Officer in order to make a proper review of the site.
- 302-07 Subdivision Design Features:
- 302-07-01 Layout of proposed streets, showing right-of-way widths and names of streets.
- 302-07-02 Location and widths of proposed pedestrian ways and utility easements.
- 302-07-03 Layout, numbers and minimum dimensions of lots.
- 302-07-04 Areas, other than streets, pedestrian ways and utility easements, intended to be dedicated or reserved for public use, including the size of such area or areas in acres.
- 302-07-05 Minimum front and side-street building set back lines indicating dimensions.

- 302-08 Stage Development: Whenever a portion of a tract is proposed for platting and it is intended or of a size for future enlargements of such platted portion, from time to time, a tentative plan for the future subdivision of the entire tract shall be submitted.

ARTICLE IV - FINAL PLAT

- 401 Procedure for Final Plat. After the approval and endorsement of a preliminary plan, the following procedure shall be followed:
- 401-01 Unless an extension of time is requested by the subdivider and granted by the Commission, the subdivider shall within one year following approval of the preliminary plan, submit to the Auditor:
- Two double mounted photographic card stock, cloth backed prints or material of equal quality, six paper prints and one transparent reproducible copy of the Final Plat, together with an up-to-date Abstract of Title or a Certificate of Title together with a registered Property Certificate. The Final Plat shall be of uniform size 20" in width and 30' in length and shall conform to Minnesota Platting Regulations, Chapter 505, Section 505.08. This Final Plat shall incorporate all changes required by the Commission. Otherwise, it shall conform to the preliminary plan. The Final Plat may constitute only that portion of the preliminary plan which the subdivider proposes to record and develop at the time. The boundary of the land so platted shall be indicated by a heavy, solid, black line. If the Final Plat is not submitted within one year, the approval of the preliminary plan shall be considered void.
- 401-02 An inspection fee of \$25.00 will be charged.
This fee will be used to help defray the expenses of the County in connection with the review of the Final Plat and the inspection of improvements.
- 401-03 The Auditor shall refer two paper prints of the Final Plat to the Plat Commission Surveyor, one to the Engineer, one to the Land Commissioner, and one to the Attorney, together with an up-to-date Abstract of Title or a Certificate of Title together with a Registered Property Certificate.
- 401-04 A report of the Plat Commission Surveyor, Engineer, the Land Commissioner, and the Attorney shall be submitted to the County Board within thirty days after the submission of the Final Plat. The Plat Commission Surveyor shall state whether the Final Plat conforms to the State Platting Regulations and is correctly surveyed. The Engineer shall state whether the Final Plat and the proposed improvements conform to the Engineering standards. The Land Commissioner shall state whether the Final Plat conforms to the preliminary plan approved by the Commission. The Attorney shall state whether the fee simple title to the platted property is in the names of the plattors.
- 401-05 The County Board shall act on the Final Plat within 60 days of the date on which it was submitted to the Auditor. It shall not approve a Final Plat unless it:
- 401-05-01 Conforms to a preliminary plan approved by the Commission.
- 401-05-02 Meets the design standards and engineering specifications set forth in this resolution.
- 401-05-03 Conforms to all Plans as adopted by the Commission and County Board.
- 401-05-04 Meets all requirements and laws of the State of Minnesota.

- 401-06 When the Final Plat is approved by the County Board and certified by the County Auditor, the subdivider shall record it with the Register of Deeds.
- 402 Data Required for Final Plat
- 402-01 If applicable, supplementary engineering data may be required on the following:
- 402-01-01 Water supply
- 402-01-02 Sewage disposal
- 402-01-03 Drainage
- 402-01-04 Flood control
- 402-01-05 Soil and percolation tests
- 402-02 Data required under regulation of state laws including accurate angular and lineal dimensions for all lines, angles and curvatures used to describe boundaries, streets, easements, areas to be reserved for public use, and other legal requirements.
- 402-03 An identification system for all lots and blocks.
- 402-04 The dimensions of all lots and building set back lines.
- 402-05 A diagram, drawn to suitable scale, showing that part of the section subdivision necessary to properly determine the boundaries of the platted area. The diagram shall show all survey corners found or restored and used in making said subdivision. All U. S. Government Survey corners shown on the Final Plat shall be recorded in the office of the Register of Deeds.
- 402-06 Complete curve data, including radii, central angles, tangent bearings, and lengths of all arcs.
- 402-07 Accurate location of all monuments.
- 402-08 Certification by a registered land surveyor to the effect that the plat represents a survey made by him and that monuments and markers shown thereon exist as located and that all dimensional and topographic details are correct.
- 402-09 Notarized certification by owner, and by any mortgage holder of record, of the adoption of the plat and the dedication of streets and other public areas in the form approved by the Attorney.
- 402-10 Form for endorsement.

Approved by the Koochiching County Board of Commissioners, at their regular meeting held this _____ day of _____, 19____.

Board Chairman

CERTIFIED:

County Auditor

MINIMUM LOT SIZE, SETBACK, AND COVERAGE REQUIREMENTS

Zoning District	Lot Width	Per Unit Max. Lot Area	% of Bldg. Cov.	Minimum Side Yd. Each Foot.	Minimum Rear Yd. 4 In Feet
R-1	200	2.5 acres	20	25	50
R-2	100	1 acre	25	10	45
R-3	100	1/2 acre	25	15	40
R-3	100	1/3 acre	30	15	40
R-3	75	1/4 acre	35	10	35
RR-1	200	1 acre	20	10	45
AF-1	300	10 acres	10	50	75

1. Utilizing private water and on-site sewage systems.
2. Utilizing a public sewer system.
3. Utilizing a public water and sewer system.

Set back (minor street)	35 ft. from ROW line	35 ft. from ROW line	35 ft. from ROW line
Set back (major thoroughfare)	110 ft. from centerline	110 ft. from centerline	110 ft. from centerline
(Secondary thoroughfare)	85 ft. from centerline	85 ft. from centerline	85 ft. from centerline
Street Driving Surface Width	26 ft.	26 ft.	26 ft.
Street Pavement	3" stabilized gravel	3" stabilized gravel	3" stabilized gravel
Sanitation	Community or Individual disposal system	Community or Individual disposal system	Community system
Erosion Protection within Construction Limits	Sod or seed	Sod or seed	Sod or seed

Note: All work and improvements of streets to be done in accordance with County Highway Department specifications and shall be subject to the recommendations, supervision and approval of the engineer.

drainage, flood control, soil and percolation is generally required at the discretion of the County Board. Minimum lot size, setback, and coverage requirements under the Koochiching County subdivision ordinance are also set forth in Exhibit 7.

The zoning ordinance for Koochiching County is shown in Exhibit 8. On page 14 of this exhibit, Section 3.42 categorizes the public waters of the county into three groups: the natural environment lakes and streams, the recreational development lakes and streams, and general development lakes and streams. These classifications are being redrafted by the state under a revision of regulation WPC14 and 15 and most of the lakes within the study area will fall within a W4 classification of critical shoreline. On page 8 of Exhibit 8, the ordinance shows the minimum shoreland lot area, lot width, setback, and coverage requirements under the various lake classifications and zoning districts. It can be seen that for W4, critical shoreland, a minimum lot width of 200 feet, a minimum lot area of two acres, and a structure setback from the water of 200 feet will be applicable. The far eastern boundary of the map, on page 11 of the exhibit, shows the general zoning districts for the study area and portions contiguous to Voyageurs National Park.

St. Louis County has a more rigorous set of regulatory requirements than its sister county, Koochiching. The subdivision ordinance, with excerpts reproduced as Exhibit 9, defines a subdivision and the conditions that require platting on page 2, Section 14.03. A plat must be obtained when a) two or more lots of less than five acres are created, b) any land division requires a new road, c) resubdividing a previously approved subdivision. These are fairly comprehensive minimum requirements. A situation not requiring a plat is the creation of only one lot per twelve month period with no new road required. If lots created conform with the zoning requirement and no more than five lots are created from an original parcel or if the lots are five acres or more and all the lots lie along an improved publicly maintained road, then they too would be exempted.

EXHIBIT 8

ZONING ORDINANCE FOR
KOOCHICHING COUNTY, MINNESOTA

KOOCHICHING COUNTY

ZONING ORDINANCE



JULY 1, 1975

**ZONING ORDINANCE FOR KOOCHICHING COUNTY,
MINNESOTA**

AN ORDINANCE ESTABLISHING COMPREHENSIVE ZONING REGULATIONS FOR THE PORTION OF KOOCHICHING COUNTY, MINNESOTA, OUTSIDE THE INCORPORATED LIMITS OF CITIES AND VILLAGES, IN ACCORDANCE WITH THE PROVISIONS OF CHAPTER 394 OF THE MINNESOTA STATUTES, AS AMENDED, AND PURSUANT TO MINNESOTA STATUTES 105.485, AND ALL ACTS AMENDATORY THEREOF, TO PROMOTE THE HEALTH, SAFETY, CONVENIENCE, AND GENERAL WELFARE OF THE INHABITANTS OF KOOCHICHING COUNTY, MINNESOTA BY DIVIDING THE COUNTY INTO ZONES AND REGULATING THEREIN THE USES OF LAND AND THE CONSTRUCTION OF ALL STRUCTURES WITH A VIEW TOWARD ENCOURAGING THE MOST APPROPRIATE USE OF LAND, AND TO RECOGNIZE AND MAINTAIN THE ECONOMIC AND APPROPRIATE USE OF LAND, AND TO RECOGNIZE AND PRESERVE THE ECONOMIC AND NATURAL ENVIRONMENTAL VALUES OF ALL LANDS WITHIN KOOCHICHING COUNTY, MINNESOTA.

ARTICLE 1.0 DEFINITIONS

Sec. 1.01 For the purpose of this ordinance, certain terms and words are hereby defined. The word person includes a firm association, organization, partnership, trust, company, or corporation as well as an individual; the present tense includes the future tense, the singular number shall include the plural and the plural the singular; the word shall is mandatory, and the word may is permissive; the word used or occupied include the words intended, designed or arranged to be used or occupied; the word lot includes the words plot or parcel.

Sec. 1.02 Accessory Structure - A structure on the same lot or contiguous parcel of land under the same ownership with, and or of a nature customarily incidental and subordinate to, the principal use or structure. Among others, farm buildings, garages, sheds, saunas, boathouses, and guest houses sleeping quarters only, shall be considered accessory structures.

Sec. 1.03 Attorney - The County Attorney of Koochiching County, Minnesota, or his authorized representative.

Sec. 1.04 Auditor - The County Auditor of Koochiching County, Minnesota or his authorized representative.

Sec. 1.05 Board of Adjustment - The Board of Adjustment of Koochiching County, Minnesota as created by Article XI of this ordinance.

Sec. 1.06 Boathouse - A structure used for the storage of watercraft and related equipment. Such structure shall not be used for guest or sleeping quarters, saunas, or dwelling purposes.

Sec. 1.07 Building - Any structure used, designed or intended for the protection, shelter, or roofed enclosure of persons, animals, or property.

Sec. 1.08 Building, Height of - The vertical distance measured from the average elevation of the proposed finished grade at the front of the building to the highest point of the roof for flat roofs, to the deck line of mansard roofs, and to the mean height between eaves and ridge for gable, hip and gambrel roofs.

Sec. 1.09 Building Line - A line measured across the width of a

lot at a point where a structure is placed in accordance with the minimum setback requirements of this ordinance.

Sec. 1.10 Cabin-Seasonal or Recreational - A residence, or dwelling structure, occupied only on a part time basis, not to exceed eight (8) consecutive months, and not requiring public services such as school bus transportation or snow plowing of roads by a governmental subdivision.

Sec. 1.11 Camp Ground - Camp ground means any of the following:

a. **Primitive camp grounds.** Primitive camp grounds within the meaning of these regulations are privately or municipally owned sites designated, maintained, intended or used for the purpose of supplying a location for overnight camping where locations are accessible by canoe, boat or by hiking but not by motor vehicles. Such areas open to the public and designated as usable by the public as primitive camp ground areas may be set aside for free or pay camping purposes.

b. **Developed camp grounds and camping resorts.** A developed camp ground or camping resort means any privately or municipally owned parcel or tract of land accessible by automobile or other engine driven vehicle designed, maintained, intended or used for the purpose of supplying accommodations for overnight use by recreational vehicle, open to the public and designated as a developed camp area and set aside for free or paying camping purposes.

c. **Walk-in camp.** A walk-in camp is equivalent to be a developed camp ground or camping resort except that it is not accessible by motor driven recreational vehicle.

Sec. 1.12 Cluster Subdivision - A change from the conventional pattern of subdivision development which groups housing units into relatively tight units while providing a unified network of open space, and incorporating minimum lot area and lot width requirements within such a unified network of open space.

Sec. 1.13 Conditional Use - A use that would not be appropriate generally or without restriction throughout the zone district, but which, if controlled as to number, area, location, or relation to neighborhood, would not be injurious to the public health, safety, welfare, morals, order, comfort, convenience, appearance, prosperity, or general welfare. Such uses may be permitted in listed zone districts upon application to the Planning Commission and subsequent approval by the County Board.

Sec. 1.14 County Board - The County Board of Commissioners of Koochiching County, Minnesota.

Sec. 1.15 Dependent Recreational Vehicle - A recreational vehicle which is dependent upon camp facilities for toilet and lavatory.

Sec. 1.16 Dwelling, Single-family - A detached residence designed for, or occupied by, one (1) family only, including a mobile home that has been placed on a foundation, connected to an approved water supply, electrical supply, and approved sewage disposal system similar to immobile housing.

Sec. 1.17 Dwelling, Two-family - A residence designed for, or occupied by, two families with separate housekeeping and cooking facilities for each. Such dwellings shall be located on a lot which is twice the minimum lot area, and at least 1 1/2 times the minimum lot width required for a single family dwelling within the zone district in which such dwellings are located.

Sec. 1.18 Dwelling, Multiple-family - A residence designed for, or occupied by, three (3) or more families, with separate housekeeping and cooking facilities for each unit. Such dwellings shall be located on a lot which is at least twice the minimum lot area required for a single family dwelling within

the same zone district, or at least 1/2 acre per dwelling unit whichever is greater; and on a lot which is at least twice the minimum lot width required for a single family dwelling within the same zone district.

Sec. 1.19 Essential Services - Services provided by public and private utilities, necessary for the exercise of the principal use or service of the principal structure. These services include underground, surface, or overhead gas, electrical, steam, water, sanitary sewerage, storm water drainage, and communication systems and accessories thereto, such as poles, towers, wires, mains, drains, vaults, culverts, laterals, sewers, pipes, catch basins, water storage tanks, conduits, cables, traffic signals, pumps, lift stations, and hydrants, but not including buildings.

Sec. 1.20 Family - One or more persons occupying a single housekeeping unit and using common cooking facilities, provided that unless all members are related by blood, marriage, or adoption, no such family shall contain over five (5) members.

Sec. 1.21 Home Occupations - A use of non-residential nature conducted entirely within the dwelling or accessory building carried on only by the inhabitants thereof, which use is clearly incidental and secondary to the use of the dwelling for residential purposes. No article may be sold or offered for sale except by members of the immediate family residing therein. Only one (1) unlighted sign, not exceeding four (4) square feet in area, may be displayed, provided that such a device is permitted within the zone district wherein said use is located.

Sec. 1.22 Junk or Salvage Yard - Any place where one (1) or more motor vehicles not containing current license plates, or not in operable condition, are stored in the open; including unused agricultural machinery; and including the salvaging and scavenging of any other goods, articles or merchandise not contained entirely within enclosed buildings, or one such article if screened from view and/or maintained in aesthetic manner.

Sec. 1.23 Hospital - Unless otherwise specified, the term "hospital" shall be deemed to include sanitarium, sanatorium, preventorium, clinic, rest home, nursing home, convalescent home and any other place for the diagnosis, treatment or other care of ailments, and shall be deemed to be limited to places for the diagnosis, treatment or other care of human ailments.

Sec. 1.24 Lot - For zoning purposes, as covered by this ordinance, a lot is a parcel of land of at least sufficient size to meet minimum zoning requirements for use, coverage and area, and to provide such yards and other open spaces as are herein specified. Such Lot shall have frontage on, and access to, an improved public road. In no case of subdivision shall any lot or parcel be created which does not meet the requirements of this ordinance.

Sec. 1.25 Lot Frontage - The front of a lot shall be construed to be the portion of the lot nearest the street, road, or a body of water if the lot abuts water. When the lot abuts a body of water, the shoreline shall be considered front yard.

Sec. 1.26 Lot Width - Shall be the distance between the side lot lines, measured at the building line. In the case of waterfront property, the lot width shall meet the minimum requirements of the zone district at both the normal high water mark and the building line as specified in Article VII of this ordinance.

Sec. 1.27 Lot of Record - A lot which is part of a subdivision recorded in the office of the Register of Deeds for Koochiching County, Minnesota, or a lot or parcel described by metes and

bounds, the description of which has been so recorded.

Sec. 1.28 Mobile Home - A single family dwelling unit suitable for year around occupancy, which, if placed and or occupied outside a mobile home park, shall be placed on a foundation so as to be substantially affixed to the site and connected to a water supply, approved sewage disposal system, and electrical supply similar to immobile housing.

Sec. 1.29 Mobile Home Park - A parcel of land which has been planned and improved for the placement of two or more mobile homes, and licensed by the State of Minnesota, and complies with all applicable requirements of this ordinance and the regulations of the Minnesota Department of Health.

Sec. 1.30 Non-Conforming Use - Any use of land, or use of a structure, established prior to the effective date of this ordinance which does not conform to the use restrictions of the zone district wherein said land use or structure is located.

Sec. 1.31 Normal High Water Mark - A mark delineating the highest water level which has been maintained for a sufficient period of time to leave evidence thereof upon the landscape. The normal high water mark is commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial.

Sec. 1.32 Parking Space, Off-street - An off-street parking space shall comprise not less than 180 square feet of parking area, plus necessary maneuvering space. Space for maneuvering incidental to parking or unparking shall not encroach upon any public right-of-way. Every off-street parking space shall be accessible to a public roadway.

Sec. 1.33 Pipeline - Any line providing goods or services to more than one dwelling or place of business.

Sec. 1.34 Planning Commission - The County Planning Commission of Koochiching County, Minnesota.

Section 1.35 Planning and Zoning Director - The Planning and Zoning Director of Koochiching County, Minnesota, or his authorized representative.

Sec. 1.36 Planned Unit Development - A condominium, group housing or cluster subdivision project, shopping area, or industrial park designed to meet all applicable requirements of this ordinance.

Sec. 1.37 Public Water - A body of water capable of substantial beneficial public use. For the purpose of this ordinance, this shall be construed to mean any lake, pond or flowage of 25 acres or more in size, or any river or stream with a total drainage area of at least two (2) square miles or more, which has the potential to support any type of recreational pursuit or water supply purpose. A body of water created by a private user where there was no previous shoreland as defined herein, for a designated private use authorized by the Minnesota Commissioner of Natural Resources shall be exempt from the provisions of this ordinance as they apply to shoreland management.

Sec. 1.38 Recreational Vehicle - Means any of the following:
a. Travel trailer. A vehicular, portable structure built on a chassis, designated to be used as a temporary dwelling for travel, recreational and vacation uses and permanently identified as a travel trailer by the manufacturer of the trailer.
b. Pick-up coach. A structure designed to be mounted on a truck chassis for use as a temporary dwelling for travel, recreation and vacation.
c. Motor-home. A portable, temporary dwelling to be used for travel, recreation and vacation, constructed as an integral part of a self-propelled vehicle.

d. **Camping trailer.** A canvas or folding structure mounted on wheels and designed for travel, recreation and vacation use.
e. **Tent.** A portable lodge of canvas or strong cloth, stretched and sustained by poles.

Sec. 1.39 Recreational Vehicle Parking Area. A parcel of land in which 2 or more spaces are occupied or intended for occupancy by recreational vehicles for transient dwelling purposes.

Sec. 1.40 Sanitary Station. A facility used for removing and disposing of wastes from recreational vehicle holding tanks.

Sec. 1.41 Self-Contained Recreational Vehicle. A recreational vehicle which can operate independent of connections to sewer, water and electric systems. It contains a water-flushed toilet, lavatory, shower and kitchen sink, all of which are connected to water storage and sewage holding tanks located within the recreational area.

Sec. 1.42 Service Building. A structure housing toilet, lavatory and such other facilities as may be required by this chapter.

Sec. 1.43 Setback. The minimum horizontal distance between a structure and the normal high water mark, road centerline, road right-of-way line, front, side, or rear lot lines.

Sec. 1.44 Shoreland. All lands located within the following distances from the normal high water mark, road centerline, road right-of-way line, front, side, or rear lot lines.

Sec. 1.45 - 1,000 feet from the normal high water mark of a lake, pond or flowage;

Sec. 1.46 - 300 feet from the normal highwater mark of a river or stream or the landward extent of a flood plain designated by ordinance on such a river or stream.

Sec. 1.47 Sign. A sign is any structure or natural object or part thereof or device attached thereto or printed or represented thereon which is intended to attract attention to any object, product, place, activity, person, institution organization, or business, or which shall display or include any letter, word, model, banner, flag, pennant, insignia, device, or representation used as or which is in the nature of an announcement, direction, or advertisement.

Sec. 1.48 Sign, On-Site. A sign relating in its subject matter to the premises on which it is located, or to products, accommodations, services, or activities on the premises.

Sec. 1.49 Sign, Off-Site. A sign other than an on-site sign.

Sec. 1.50 Structure. Anything placed, constructed or erected with a fixed location on the ground, or attached to something having a fixed location on the ground. Among other things, structures include buildings, portable buildings, mobile homes, travel trailers, walls, fences, signs, billboards and poster panels, playing courts (tennis, handball, etc.), swimming pools and patios.

Sec. 1.51 Trailer. A portable vehicle designed and used for temporary sleeping purposes while its occupants are engaged in the pastime of camping.

Sec. 1.52 Unincorporated Area. That area lying outside the incorporated limits of any city or village.

Sec. 1.53 Use. The specific purpose for which land or a building is designed, arranged, intended, or for which it is or may be occupied or maintained. The term "permitted use" or its equivalent shall not be deemed to include any nonconforming

use.

Sec. 1.54 Variance. A variance is an appeal for relief from certain requirements of the zoning ordinance as deemed necessary by the Board of Adjustment when the strict interpretation of the ordinance would create undue hardship because of irregular lot size, topographic or other characteristics of the land. No variance shall have the effect of allowing in any one district uses which are prohibited in that zone district.

Sec. 1.55 Yard. A required open space unoccupied and unobstructed by any structure or portion of a structure, from 30 inches above the ground level of the graded lot upward, provided however, that fences, utility poles, lawn lights, antennae, and related minor equipment may be permitted in any yard, provided that they do not create a traffic safety hazard.

Sec. 1.56 Yard, Front. Yard extending between the side lot lines across the front of a lot at the side nearest the street. In any required front yard, no fence or wall, shall be permitted which materially impedes vision across such yard above the height of 30 inches, and no hedge or other vegetation on corner lots shall be permitted which material impedes vision across such yard.

Sec. 1.57 Yard, Side. A yard extending from the rear line of the required front yard to the rear lot line.

Sec. 1.58 Yard, Rear. A yard extending across the rear of the lot between inner side yard lines.

ARTICLE 2.0 ZONING DISTRICTS

2.10 Establishment of Districts

For the purpose of this Ordinance, the unincorporated areas of Koochiching County are hereby divided into the following types of districts:

R-1 : Residential District
R-2 : Residential District
R-3 : Residential District
RR-1: Residential-Recreation District
AF-1 : Agricultural-Forestry District
C-1 : Commercial District
M-1 : Manufacturing District
M-2 : Manufacturing District
O-1 : Open Space District
O-2 : Open Space District
CA-1 : Critical Areas District
W-1 : Natural Environment Lakes & Streams
W-2 : Recreation Development Lakes & Streams
W-3 : General Development Lakes & Streams
W-4 : Critical Lakes & Streams
PUD : Planned Unit Development District

Sec. 2.11 - Zoning Map and District Boundaries The locations and boundaries of these districts are shown in a single map officially designated "official Zoning Map, Koochiching County, Minnesota, dated February 1, 1974. The County Auditor shall file a certified copy thereof with the Register of Deeds for record. The map and all explanatory matter thereon are hereby made a part of this ordinance. These maps, together with all explanatory matter and regulations thereon, are an integral part of this ordinance. District boundaries are normally lot lines; section and quarter section lines, center lines of streets, highways, railroads, or alleys. Questions regarding exact location of district boundaries shall be decided by the County Zoning Administrator. Decisions may be reviewed on appeal to the Board of Adjustment as provided in Section 8.00 of this ordinance.

The single official copies of the "Official Zoning Map,

Koochiching County, Minnesota, together with a copy of this ordinance shall be kept at the County Zoning Administrator's office and shall be available for public inspection during office hours.

Sec. 2.12 - In order to provide for the wise development and utilization of the shorelands of public waters for the preservation of water quality, natural characteristics, economic values and the general health, safety, and welfare all public waters within the unincorporated area of Koochiching County, Minnesota, have been given a public waters classification by the Minnesota Department of Natural Resources. Use of shorelands within these classes are hereby designated, and regulated within this ordinance, pursuant to the provisions of Minnesota Statutes 105.435, and are shown on the official Zoning Map for Koochiching County, Minnesota, based upon compatibility of the designated type of land use with the public waters classification. Specific regulations concerning shorelands refer to Article 3.40.

Sec. 2.20 - No building or structure, or part thereof, shall hereafter be erected, constructed, reconstructed, moved, or structurally altered and no land shall change in use unless in conformity with all of the regulations herein specified in this ordinance, and all acts amendatory thereof.

Sec. 2.30 - In each zone district, each structure hereafter erected or altered shall be provided with the yards and setbacks specified, shall be on a lot of the area and width specified, and shall not exceed the percent of maximum total building coverage of its lot as specified in this ordinance. No open space, lot, off-street parking or loading space required for a building or structure shall be included as part of a lot. open space, off-street parking or loading space for another building or structure unless the joint space meets all requirements of all buildings or structures for which it serves.

Sec. 2.40 Water Supply - Any public or private supply of water for domestic purposes must conform with Minnesota Department of Health standards for water quality, and-or all ordinances of Koochiching County, Minnesota applicable thereto.

Sec. 2.51 - No rubbish or trash of any sort shall be thrown or discarded in any manner into any public water, or into any watercourse leading to a public water.

Sec. 2.52 - No solid waste disposal site shall be located within the jurisdiction of this ordinance unless approved by the Minnesota Pollution Control Agency, the Planning Commission, and the County Board.

Sec. 2.60 Sewage Disposal - Any premises intended for human occupancy must be provided with an adequate method of sewage disposal to be maintained in accordance with all regulations of the Minnesota Pollution Control Agency, and the regulations of Koochiching County, Minnesota applicable thereto as set forth in the Code Regulating Individual Sewage Disposal Systems, Recommended by the Minnesota Department of Health 1971; the county shall provide for the gradual elimination of sanitary facilities inconsistent with the afore mentioned regulations over a period of time from the date of enactment of the County Ordinance; in the case of non-conforming sanitary systems presenting a public health hazard the system shall be repaired to comply with the code and ordinance within thirty (30) days after inspection and notification by the proper county authority, (applicable May 1 to November 1).

Sec. 2.70 Agricultural Waste Disposal - Any agricultural waste disposal operations located within the jurisdiction of this ordinance shall conform to the standards, criteria, rules and regulations of the Minnesota Pollution Control Agency and-or the regulations of Koochiching County, Minnesota applicable thereto.

Sec. 2.71 Disposal and Refuse of Abandoned Motor Vehicles and Other Scrap Metal All abandoned motor vehicles and other scrap metal shall be collected, reduced, transported and processed in a manner consistent with Minnesota Regulations

SW 75, 76, 77, 78 and 79 and Minnesota Statutes 1971, Chapter 168B.

Sec. 2.75 - Zoning Districts

Sec. 2.76 - R-1 RESIDENTIAL DISTRICT

This district is intended to promote low density development on large lots in areas not requiring public water and sewer services. It further provides for year round, seasonal agriculture and forest related development throughout the country.

(a) Permitted Uses

(1) One and two family year-round and seasonal dwellings including mobile homes.

(2) Farmland and livestock

(3) Forest production

(4) Private garages

(5) Essential services and utilities intended to serve the principal permitted use

(6) Signs subject to Article 4.0

(7) Customary accessory uses provided such uses are clearly incidental to the principal use.

(b) Uses Authorized by Conditional Permit

(1) Public and semi-public uses including but not limited to the following: public and private schools, churches, public parks, and recreation areas, hospitals, rest homes and homes for the aged, fire and police stations, historic sites, sewage disposal plants, garbage incinerators and maintenance repair or storage buildings.

(2) Telephone, telegraph and power transmission towers, poles and lines, including transformers, substations, relay and repeater stations, equipment, housing and other necessary appurtenant equipment and structures.

(3) Home occupations or professional offices provided no such use occupies more than 25 per cent of the total floor area of the dwelling, not more than one nonresident person is employed on the premises, and such use will not include an operational activity that would create a nuisance to be otherwise incompatible with the surrounding residential area.

Sec. 2.77 - R-2 RESIDENTIAL DISTRICT

This district provides for one and two family residences without livestock and at a smaller lot size than the R-1 District.

(a) Permitted Uses

(1) All R-1 uses except livestock

(b) Uses authorized by Conditional Permit

(1) All agricultural uses

(3) Mobile home parks

(4) Pipelines

(5) Public and semi-public uses including but not limited to the following: public and private schools, churches, public parks, and recreation areas, hospitals, rest homes and homes for the aged, fire and police stations, historic sites, sewage disposal plants, garbage incinerators and maintenance repair or storage buildings.

(6) Telephone, telegraph and power transmission towers, poles and lines, including transformers, substations, relay and repeater stations, equipment housing and other necessary appurtenant equipment and structures.

(7) Home occupations or professional offices provided no such use occupies more than 25 per cent of the total floor area of the dwelling, not more than one nonresident person is employed on the premises, and such use will not include an operational activity that would create a nuisance to be otherwise incompatible with the surrounding residential area.

Sec. 2.78 - R-3 RESIDENTIAL DISTRICT

This district provides for more intense use of land with smaller required lot sizes, multi-family dwellings permitted and allowances for hook ups to public water and sewer services.

The district is generally contained on the edges of an urban area.

- (a) Permitted Uses
 - (1) All R-2 except forest production uses
 - (2) Multi-family dwellings
- (b) Uses Authorized by Conditional Permit
 - (1) Mobile home parks
 - (2) Pipelines
 - (3) Public and semi-public uses including but not limited to the following: public and private schools, churches, public parks, and recreation areas, hospitals, rest homes and homes for the aged, fire and police stations, historic sites, sewage disposal plants, garbage incinerators and maintenance, repair or storage buildings.

(4) Telephone, telegraph and power transmission towers, poles and lines, including transformers, substations, relay and repeater stations, equipment housing and other necessary appurtenant equipment and structures.

(5) Home occupations or professional offices provided no such use occupies more than 25 per cent of the total floor area of the dwelling, not more than one nonresident person is employed on the premises, and such use will not include an operational activity that would create a nuisance to be otherwise incompatible with the surrounding residential area.

(6) Forest management programs which are designed to reestablish, maintain or enhance forest cover within the district.

Sec. 2.79 - RR-1 RESIDENTIAL—RECREATION DISTRICT

This district is intended to provide for seasonal and year round residential development and essential recreation-oriented services in areas of high recreational value where soil conditions and other physical features will support such development without depleting or destroying natural resources. It recognizes forest cover as being a dynamic living resource requiring proper management for its continuance and that carefully planned and executed management practices are not incompatible with residential-recreation uses.

- (a) Permitted Uses
 - (1) One-family and two-family seasonal and year round dwellings.
 - (2) Private garages and carports
 - (3) Horticulture and gardening
 - (4) Essential services and utilities to serve the principal permitted use
 - (5) Signs subject to the provisions of Article 4.00.
 - (6) Customary accessory uses provided such uses are clearly incidental to the principal permitted use.
- (b) Uses Authorized by Conditional Permit

(1) A single mobile home provided the lot area and setback requirements of this district are met and the owner provides an accessory building or garage for storage purposes.

(2) Mobile home parks and trailer parks subject to the provisions of Section 4.54.

(3) Telephone, telegraph and power transmission towers, poles and lines including transformers, substations, relay and repeater stations, equipment, housing and other necessary appurtenant equipment and structures.

(4) Recreational service-oriented uses such as resorts and motels, restaurants and cocktail lounges, marinas, land and

water air bases, gas stations, sport shops and bait sales, repair shops, and other recreational services which in the opinion of the County Planning Commission are of the same general character or clearly incidental to a permitted use or use authorized by conditional permit.

(5) Forest management programs which are designed to reestablish, maintain or enhance forest cover within the district.

Sec. 2.80 - AF-1 AGRICULTURE- FORESTRY DISTRICT

This district is dedicated to the continuation of forest programs, agricultural pursuits and related uses in those areas best suited for such activities. It is intended to encourage agriculture and forest management programs and also to recognize the value of the forest as a recreational resource by permitting as a conditional use certain recreational activities which when adequately developed, are not incompatible to the forest.

- (a) Permitted Uses
 - (1) One and two-family farm residences and farming activities.
 - (2) Production of forest crops, including tree plantations, portable sawmills, debarking operations, and chipping facilities.
 - (3) Harvesting of wild crops such as marsh hay, ferns, moss, berries, tree fruits and tree seeds.
 - (4) Hiking trails, wildlife refuges, and snowmobiling trails and game management habitat areas.
 - (5) Signs, subject to the provisions of Article 4.00
 - (6) Essential services and utilities to serve the principal permitted uses.
- (b) Uses Authorized by Conditional Permit
 - (1) Public and private parks, playgrounds and winter sports areas.
 - (2) Dams, plants for production of electric power and flowage areas.
 - (3) Mobile home and trailer parks
 - (4) Forest-connected industries such as pulp and paper production plants, and permanent sawmills.
 - (5) Riding stables
 - (6) Farm-oriented recreational and winter sports activities, and game fur farms; the principal use shall be farming activities.
 - (7) Year-round residences for caretakers of recreational areas.
 - (8) Telephone, telegraph and power transmission towers, poles and lines including transformers, substations, relay and repeater stations, equipment housings and other necessary appurtenant equipment and structures, radio and television stations and transmission towers, fire towers and microwave radio relay towers.
 - (9) Garbage and refuse disposal sites
 - (10) Airports
 - (11) Pipelines

(12) Quarries, mines and gravel pits, subject to the provisions of Section 4.52.

(13) Home occupations.

Sec. 2.81 - C-1 COMMERCIAL DISTRICT

This district is intended to provide for the orderly and attractive grouping at appropriate locations, of retail stores, shops, offices and similar commercial establishments.

(a) Permitted Uses

Facilities such as, but not limited to the following:

(1) Retail stores and shops offering convenience goods and services.

(2) Business and professional offices and studies.

(3) Banks and savings and loan offices.

(4) Public and semi-public buildings and institutions.

(5) Commercial entertainment facilities.

(6) Laundromats

(7) Restaurants

(8) Taverns

(9) Medical and dental clinics

(10) Auto service stations and maintenance facilities

(11) Public and private marinas.

(12) Recreation service oriented facilities as stated in the RR-1 District.

(13) Motels and tourist homes

(14) Rooming and boarding houses.

(15) Signs subject to the provisions of Article 4.00.

(16) Essential services and utilities to serve the principal permitted uses.

(b) Uses Authorized by Conditional Permit

(1) Public and semi-public conditional uses as stated in the R-1 District.

(2) New and used car sales establishments.

(3) Wholesaling establishments

(4) Transportation terminals

(5) Farm implement sales firms

(6) Outdoor theaters

(7) Miniature golf, go-karts, and amusement parks.

(8) Drive-in establishments offering in-car service to customers.

Sec. 2.82 - M-1 MANUFACTURING DISTRICT

This district provides for limited industrial uses, wholesale warehousing, general storage, transportation, terminal and repair shops. These uses would not, by actual physical or operational characteristics be detrimental to surrounding areas by reason of smoke, noise, dust, odor, traffic or similar

factors relating to public health, welfare, and safety.

(a) Permitted Uses+

(1) Manufacturing, assembly, fabricating, and processing, plants and similar type industrial operations consistent with the purposes of this district.

(2) General warehousing

(3) Accessory uses clearly incidental to a permitted use.

(b) Uses Authorized by Conditional Permit

(1) Salvage yards

(2) Quarrying, mining and processing of products from these activities.

(3) Sanitary land fills and the like.

+Any use determined to be objectionable by the Count Planning Commission and with County Board approval, on the basis of pollution, noise, dust, smoke, vibration, odor, flashing lights, or danger of explosion may be permitted only upon the issuance of a conditional use permit setting for dimensional and site requirements, performance standards, aesthetic controls, and pollution standards for that particular use.

Sec. 2.83 - M-2 MANUFACTURING DISTRICT

This district provides for all major industrial uses not covered in the M-1 District.

(A) Permitted Uses+

(1) Manufacturing, assembly, fabricating, and processing plants and similar type industrial operations consistent with the purposes of this district.

(2) General warehousing

(3) Accessory uses clearly incidental to a permitted use.

(b) Uses Authorized by Conditional Permit

(1) Salvage yards

(2) Quarrying, mining, gravel pits and processing of products from these activities, subject to the provisions of Sec. 2.52.

(3) Sanitary land fills and related activities.

Sec. 2.84 - O-1 OPEN SPACE DISTRICT

This district is intended to prevent destruction of natural or manmade resources; maintain large tracts of permanent open spaces, provides for the continuation of forest management and production programs, and fosters certain seasonal residential uses, and other activities which are not incompatible with the public welfare.

(a) Permitted Uses+

(1) Seasonal dwellings not requiring school or other related public services.

(2) Forest management programs

(3) Soil and water conservation programs

(4) Wildlife preserves

(5) Grazing

(b) Uses Authorized by Conditional Permit

(1) Public and private parks

(2) Dams, plants for the production of electric power and flowage areas.

+Any use determined to be objectionable by the County Planning Commission and with County Board approval on the basis of pollution, noise, dust, smoke, vibration, odor, flashing lights, or danger of explosion may be permitted only upon the issuance of a conditional use permit setting for dimensional and site requirements, performance standards, aesthetic controls, and pollution standards for that particular use.

(4) Accessory structures

(5) Orchards and wild crop harvestings

(6) Telephone, telegraph and power transmission towers, poles and lines including transformer, substations, relay and repeater stations, equipment housings and other necessary appurtenant equipment and structures, radio and television stations and transmission towers, fire towers, and microwave radio relay towers.

(7) Signs, subject to the provisions of Section 4.00.

No use shall involve dumping or filling of mineral soil or peat removal or any other use that would disturb the natural fauna, flora, water courses, water regimen, or topography.

Sec. 2.85 - O-2 OPEN SPACE DISTRICT

This district is intended to be used to prevent destruction of natural or man-made resources and to protect water courses including the shorelands of navigable waters, and areas which are not adequately drained, or which are subject to periodic flooding, where developments would result in hazards to health or safety; would deplete or destroy resources; or be otherwise incompatible with the public welfare.

(a) Permitted Uses

(1) Soil and water conservation programs.

(2) Forest management programs

(3) Wildlife preserves

(b) Uses Authorized by Conditional Permit

(1) Public and private parks

(2) Grazing where such activities will not be in conflict with the stated purposes of this district.

(3) Orchards and wild crop harvestings.

No use shall involve dumping or filling of mineral soil or peat removal that would disturb the natural fauna, flora, water courses, water regimen, or topography.

Sec. 2.86 - CA-1 CRITICAL AREAS DISTRICT

This district provides for special emphasis on maintenance and enhancement of forests, wildlife, aesthetics, air, lands and

waters along major land and water corridors of travel used by the touring public in reaching nationally significant attractions located in or in close proximity to Koochiching County.

It recognizes that both the attraction and the basic economy of Koochiching County is predicated on healthy, growing forests. It stipulates that the indigenous, wildlife, clean air, productive land and clear waters of this county are the results of forests scientifically managed to maintain them in a growing and healthy state. It supports proven management techniques necessary to perpetuate the forest resource of Koochiching County.

The intent of this District is to provide zones representative of this County's basic resources, economy and life style through which the touring public may pass and to prevent detracting by incompatible structures and designs or proliferation of commercial ventures.

This district allows, as a conditional use, cluster developments of sufficient size and distribution to provide adequate goods and services for the touring public facilities as are needed to secure the health, safety and welfare of those in, or passing through, this district. Such uses shall be limited overall by the ability of the lands and waters to support such uses without serious deterioration of the basic attraction itself.

All new construction and remodeling or rehabilitation of existing construction shall conform to standards for this District, at that time in existence, as duly adopted by the Planning Commission and approved by the County Board of Commissioners.

(a) Permitted Uses

(1) One and two family farm residences and farming activities.

(2) Production of forest crops, including tree plantations.

(3) Portable sawmills, debarking operations and chipping facilities when beyond view from the surface normally traveled by the touring public at the season of year in which the chipping operation takes place.

(4) Portable and temporary chipping units whose principal function is to reduce tops, limbs and other vegetative material in route-side and powerline maintenance programs or in site preparation for planted, sucker or seeded forest cover screens.

(5) Harvesting of wild game in accordance with State regulations.

(6) Harvesting of wild crops such as marsh hay, ferns, moss, berries, tree fruits and tree seeds.

(7) Game Management habitat areas.

(b) Uses Authorized by Conditional Permit

(1) Planned commercial cluster developments providing needed goods and services.

(2) Public and private parks.

(3) Accessory structures.

(4) Telephone, telegraph and power transmissions towers, poles and lines including transformers, substations and repeater stations, equipment housing and other necessary appurtenant equipment and structures, radio and television transmission towers, fire towers and microwave radio relay

towers.

(5) Signs, subject to the provisions of Section 4.00

(6) Hiking trails, wildlife refuges, snowmobile trails.

Sec. 2.37 - PUD: Planned Unit Development District

The PUD District is intended to provide for large-scale residential or residential-recreational development. This district shall have no definite boundaries until such are approved by the County Board on the recommendation of the County Planning Commission. Plans for the proposed development shall be submitted in duplicate, and shall show the location, size, and proposed use of all structures and land included in the areas involved. The plans may provide for a combination of single and multi-family development as well as related commercial uses, provided that the plans indicate that:

(1) A single area of at least five acres is involved.

(2) Each residential building and lot in the District will conform to the R-2 District requirements and each commercial building and lot will conform to the C-1 District requirements.

(3) Adequate streets and sidewalks as determined to serve the needs of the area involved will be provided.

(4) Adequate access to public streets and proper internal circulation will be provided.

(5) Adequate sewer and water facilities will be provided.

(6) The development will constitute a reasonable extension of the living areas in the county and will be compatible with surrounding land uses.

✓ Sec. 2.38 - Shoreland Protection Districts (Overlay District)

This district provides for the protection of waters and shorelands, and for safe and orderly shoreland development in Koochiching County. The intent is to further the maintenance of safe and healthful conditions; prevent and control water pollution; protection of spawning grounds, fish and aquatic life; control buildings sites, placement of structures and uses, and to preserve shorecover and natural beauty. The district includes all lands in the unincorporated areas of the county within the following distance from the normal high-water elevation of navigable water: 1,000 feet from a lake, pond, or flowage, and 300 feet from a river or stream or to the landward side of a flood plain whichever distance is greater.

(a) Permitted Uses

(1) Any use permitted in the underlying districts, subject to the shoreland provisions of this ordinance.

(2) Any accessory use permitted in the underlying districts, subject to the shoreland provisions of this ordinance.

(b) Uses Authorized by Conditional Permit

(1) Any conditional use authorized in the underlying districts, subject to the shoreland provisions of this ordinance.

Sec. 2.39a -

MINIMUM SHORELAND LOT AREA Width and Setback Requirements

Lake Classification	Lot Width	Lot Area	Structure Setback
Natural Environment W-1	200 feet	2 acres	200 - feet
Recreational Development W-2	150 feet	1 acre	100 - feet
General Development W-3	100 feet	1/2 acre	75 feet
Critical Shoreland W-4	200 feet	2 acres	200 feet

SEC. 2.39b

MINIMUM LOT SIZE, SETBACK, AND COVERAGE REQUIREMENTS

Zoning District	Lot Width	Per Unit Lot Area	Max. % of Hdg. Cov. Each Pt.	Minimum Side Yd. 1st Feet	Minimum Rear Yd. 4th Feet
R-1	200	2.5 acres	20	25	50
R-2	100	1 acre	25	10	45
R-3	100	1/2 acre	25	15	40
R-4	100	1/4 acre	20	15	40
R-5	75	1/4 acre	35	10	35
RR-1	200	1 acre	20	10	45
AP-1	200	10 acres	10	50	75
C-1	200	1 acre	50	10	35
M-1	200	1 acre	50	20	40
M-2	200	2 acres	50	20	50
O-1	200	5 acres	20	25	50
O-2					
CA-1	300	10 acres	10	50	75

1 Utilizing private water and on-site sewage systems.

2 Utilizing a public sewer system.

3 Utilizing a public water and sewer system.

For Highway, front, and rear yard setbacks, see Article 3.20.

ARTICLE 3.0 REGULATIONS

Sec. 3.10 Application of Regulations

The use of any land or water; the size, shape, and placement of lots; the use, size, height, type, and location of structures thereon; and the provision for open spaces shall be in compliance with the regulations set forth on the "Official Zoning Map, Koochiching County, Minnesota" and in the text of this ordinance.

Sec. 3.20 Standard District Regulations

Sec. 3.21 Setback Requirements on Highways and Roads

a) All state and U.S. numbered highways are hereby designated Class A highways. The setback line for Class A highways and for any other roads designated as major roads on official maps in effect in the county shall be 130 feet from the centerline of the highway or 66 feet from the right-of-way line whichever is greater.

b) All country trunk highways not otherwise designated as Class A highways are hereby designated Class B highways. The setback for Class B highways and for roads designated as arterial roads on official maps in effect in the county shall be 75 feet from the centerline of such highway or 42 feet from the right-of-way line whichever is greater.

c) All town roads not otherwise designated Class A or Class B highways are hereby designated Class C highways. The setback for Class C highways and for streets other than major and arterial roads designated as such on official maps in effect in the county shall be 63 feet from the centerline of the highway or 30 feet from the right-of-way line, whichever is greater.

d) A setback equal to the average setback of existing principal buildings located within 500 feet of a proposed building site and on the same side of the street, shall be permitted where five of these buildings do not conform with the appropriate setback line.

e) After the effective date of this ordinance, minor, readily removable structures such as open fences or signs permitted by this ordinance may be placed within setback lines. Public utility equipment without permanent foundations is also permitted. When deemed necessary by the County Planning Commission in connection with development such as highway improvement programs, property owners and public utilities may be required to remove, at their own expense and without

right-of-compensation, any such structures erected within setback lines.

Sec. 3.22 Visual Clearance at Intersections

In each quadrant of every street intersection there shall be designated a visual clearance triangle bounded by the street centerline and a line connecting them 300 feet from a Class A highway intersection, 250 feet from a Class B highway, and 200 feet from a Class C highway intersection.

If two highways of a different class intersect, the largest distance shall apply to both centerlines. Within this triangle, no object over 2 1/2 feet in height, above these streets shall be allowed if it obstructs the view across the triangle. Posts or open fences are excluded from this provision. Tree trunks shall be exempt where they are unbranched to a height of 10 feet and located a minimum of 30 feet apart.

Sec. 3.23 - Access Driveways

Access driveways to highways from abutting properties shall comply with the following requirements:

Class of Highway	Minimum Distance of Highway Frontage Between Access Driveways or Separate Land Uses	Minimum Distance Access Driveways May Be Located to the Right-of-way of an Intersection Hwy.
Class A Highways		
Federal Aid Primary Hwys.	400 feet	300 feet
Fed. Aid Secondary Hwys.	300 feet	250 feet
Class B Highways	300 feet	150 feet
Class C Highways	75 feet	75 feet

When there is more than one lot abutting on Class A and Class B highways between access driveways, a service road of not less than 50 feet right-of-way shall be provided across the entire frontage of each lot unless a temporary access permit has been granted with the approval of the agency having jurisdiction over the highway. Use of access is limited to the use authorized in the temporary access permit. This permit would be revokable when a frontage road is provided.

The maximum number and width of access driveways to highways and service roads shall be as follows:

Type of Access Driveway	Maximum Number of Access Driveways	Maximum Width of Access Driveway
Commercial and Industrial Land Uses	2	35 feet
Other Land Uses	1	24 feet

Where cross-overs in median stripes have been provided, access driveways shall be directly opposite these cross-overs.

Sec. 3.24 - Excessive Height Permitted

Heights of the following structures may exceed ordinance limits for the district in which it is to be located with the approval of the County Planning Commission; cooling towers, penthouses, stacks, lookout towers, silos, windmills, water towers, spires, radio and television aerials, masts, antennae and necessary mechanical appurtenances.

Sec. 3.25 - Lot Sizes

a) After adoption of this ordinance, no lot area shall be so reduced that the dimensional and yard requirements required by this ordinance cannot be met. Lots existing and of record prior to adoption of this ordinance, but of substandard size, may be devoted to uses permitted in the district in which located.

b) If two or more substandard lots with continuous frontage

have the same ownership as of the effective date of this ordinance, the lots involved shall be considered to be an individual parcel for the purposes of this ordinance.

c) Lots created after adoption of this ordinance and which are not served by public sewer systems shall meet minimum area requirements of the Koochiching County Sanitary Code and the Koochiching County Subdivision Control Ordinance.

Sec. 3.26 ACCESSORY Uses and Structures

a) Any permanent, roofed structure serving as an accessory use, if attached to the principal building, shall be considered a part of the principal building. If such structure is a building and is not attached to the principal building, it shall conform to the setback, and other dimensional requirements of the district within which it is located.

Sec. 3.27 - Drainage, Sanitation and Water Supply

a) No principal building shall be erected, structurally altered, or relocated on land which is not adequately drained at all times by reasons of adverse soil conditions, steep slopes, shallow impermeable bedrock, periodic flooding, or where the lowest floor level is less than 4 feet above the highest ground-water level.

b) No principal building intended for human use or occupancy shall be erected, structurally altered, or relocated on a lot, unless provision is made for safe and adequate facilities for water supply and disposal of sewage in accordance with the regulations of the Koochiching County Sanitary Code and in conformance with minimum standards of the Minnesota Department of Health.

c) The County Zoning Administrator shall not hereafter authorize a building to be erected, structurally altered, or relocated which has a private waste disposal system unless the plans for the system have been reviewed in accordance with the provisions of the Koochiching County Sanitary Code, and a sanitary permit has been issued.

Private sewage disposal systems for dwelling units shall meet the location requirements of the Koochiching County Sanitary Code.

d) Where connection is not to be made to a public water system, no residential use shall be permitted unless provision is made for a safe and adequate supply of drinking water located on the premises, a permit for which has been obtained in accordance with the provisions of the Koochiching County Sanitary Code.

e) Planned unit developments shall be served by sewage facilities which meet the requirements of the Koochiching County Sanitary Code and the applicable minimum standards of the Minnesota Department of Health and the Pollution Control Agency.

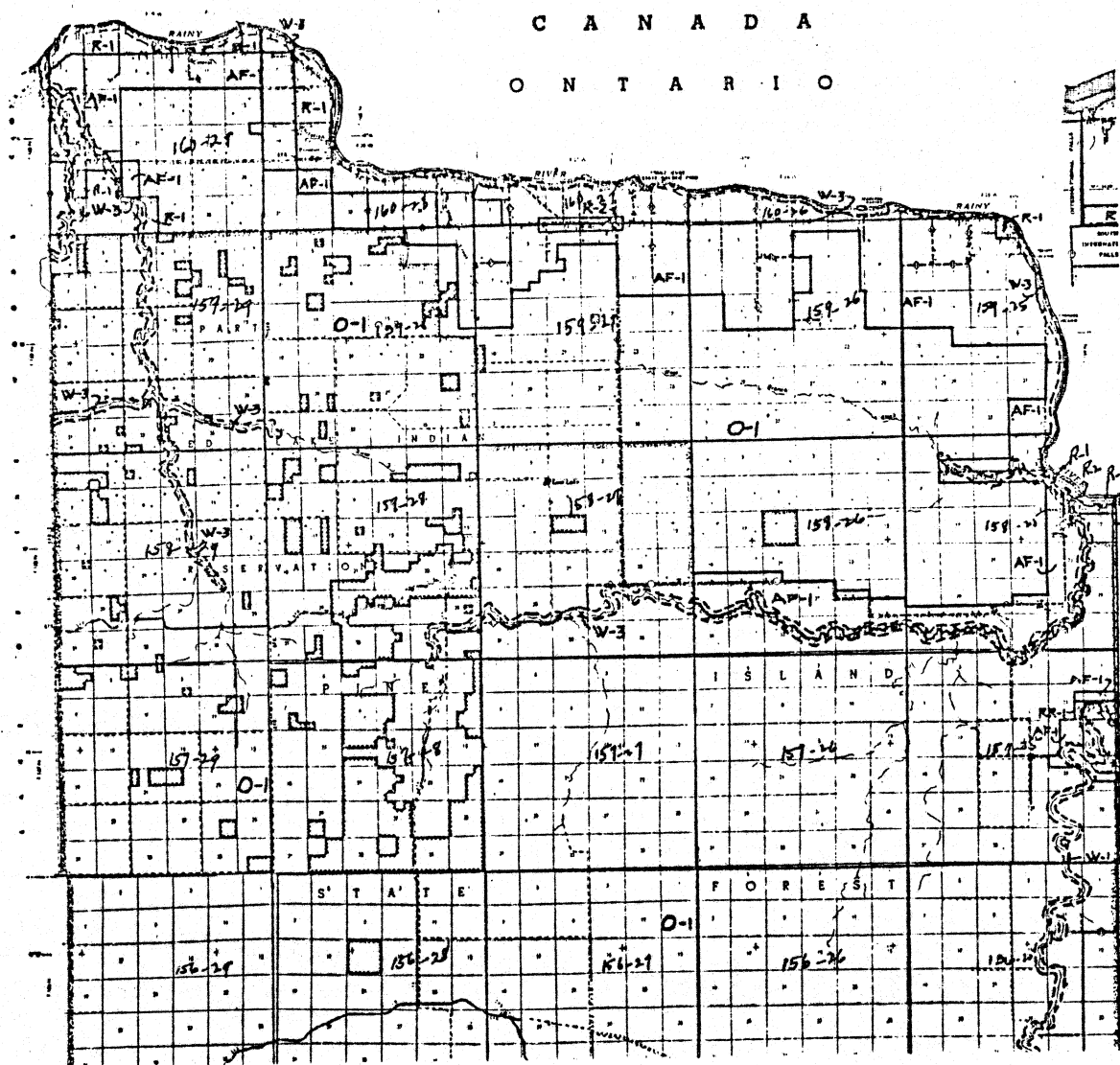
Sec. 3.30 - Supplementary Regulations

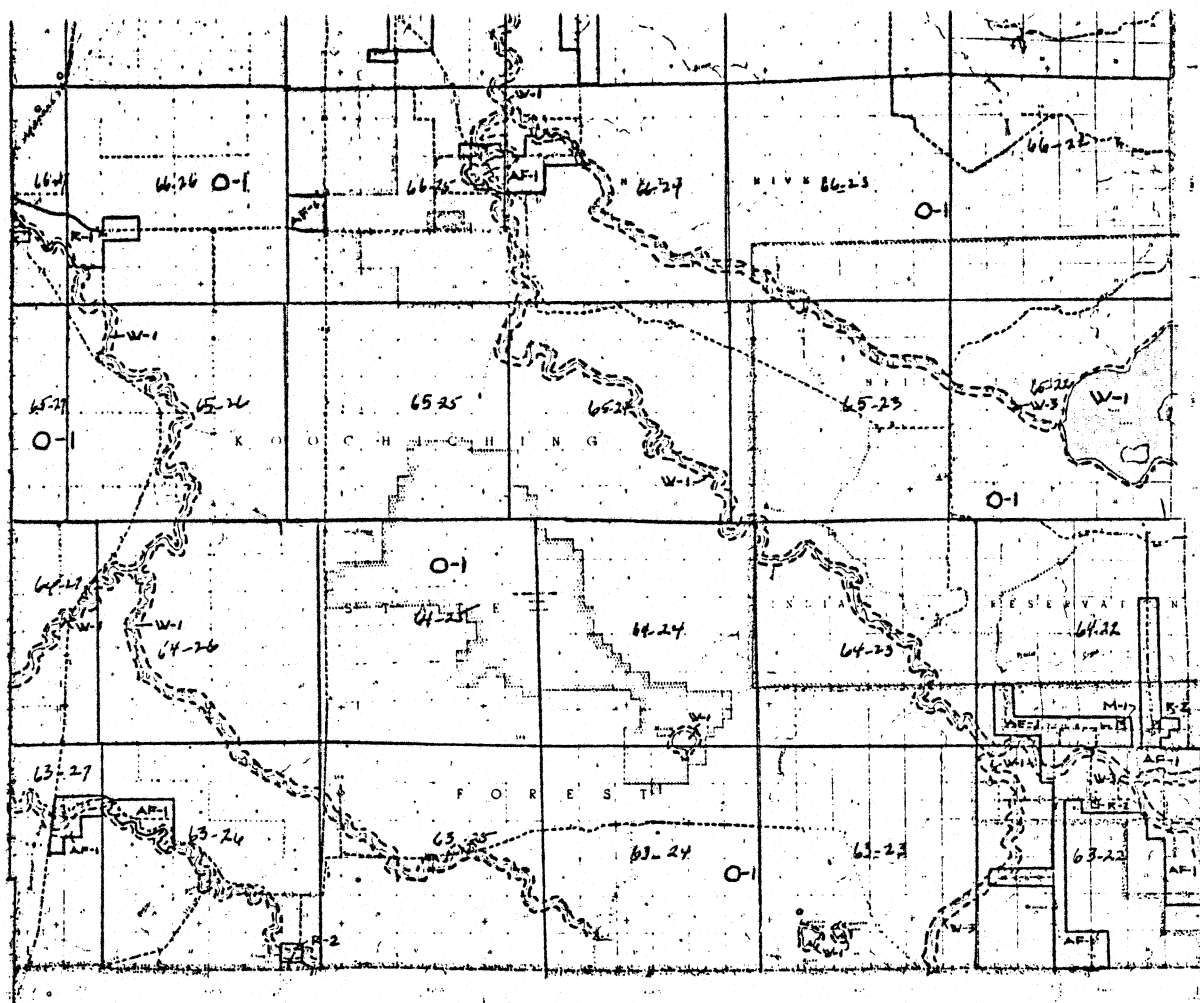
(1) Airport Safety Zones

Except for field crops and fences under five feet high, the maximum height of any object located within 500 feet of either side of the centerline of a landing strip, and extended to a distance of 2 miles from the end of the runway shall be no higher than 1-40 of the distance of the object to the landing strip.

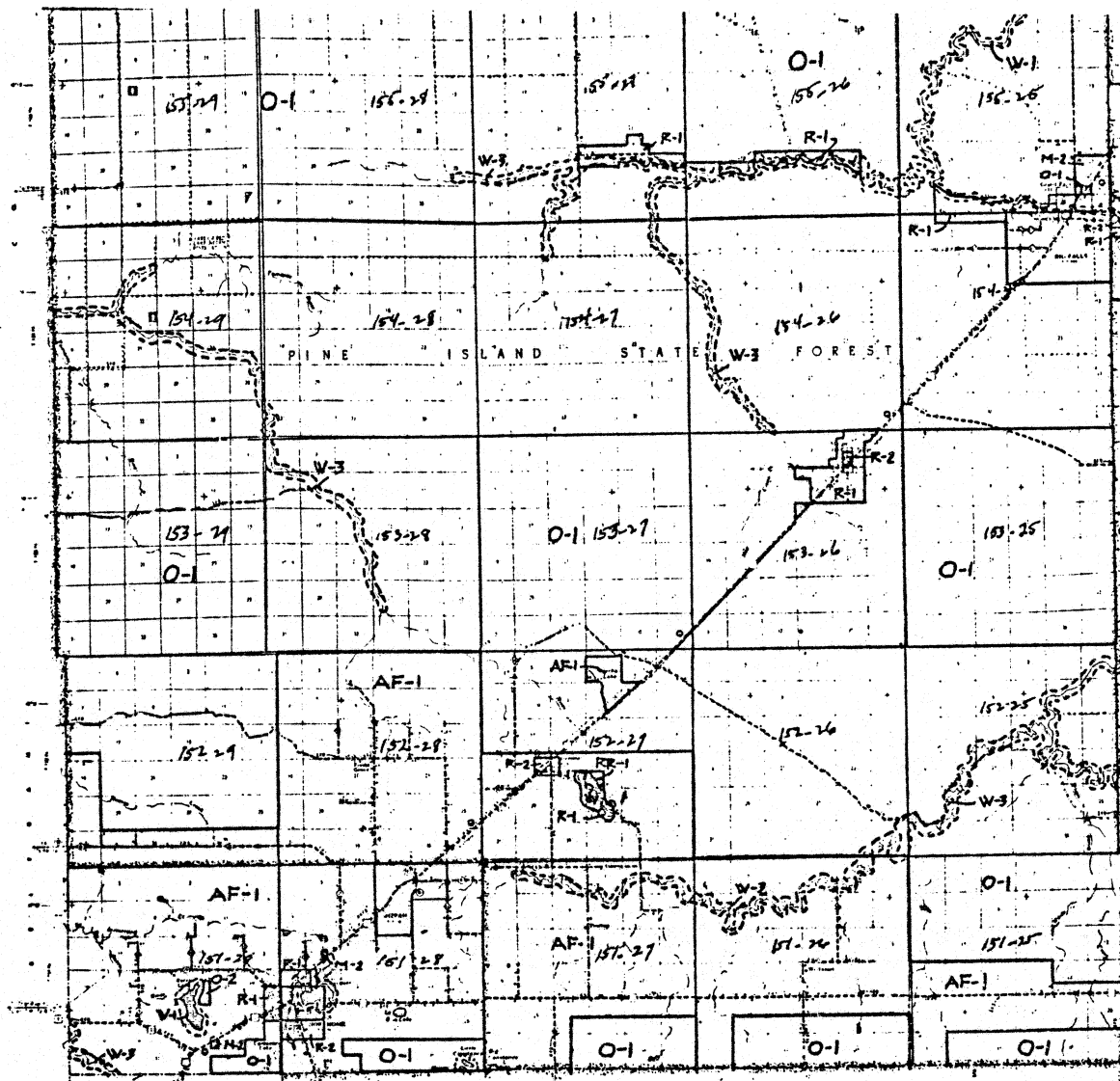
(2) Off-street Loading and Parking

Loading - Space for off-street loading and unloading of vehicles





R-1	LOW DENSITY RES. AGRICULTURE	AF-1	AGRICULTURE FORESTRY
R-2	MEDIUM DENSITY RES.	M-1	LIGHT INDUSTRY
RR-1	RESIDENTIAL RECREATION	M-2	HEAVY INDUSTRY
W-1	NATURAL ENVIRONMENT	CA-1	CRITICAL AREAS
W-3	GENERAL DEVELOPMENT	PUD	PLANNED UNIT DEVELOPMENT
C-1	COMMERCIAL	O-1	OPEN SPACE



shall be provided for every building used or designed for commercial, industrial, manufacturing or warehousing purposes. One (1) such space shall be provided for every ten thousand (10,000) square feet of floor area or fraction thereof, and such spaces shall be a minimum of ten (10) feet in width, thirty-five (35) feet in length and fourteen (14) feet in height.

Parking - Off-street automobile parking or storage space shall be provided on every lot on which any new structures are hereafter established. Such space shall be provided with vehicular access to a street or alley and shall be deemed to be required open space associated with the permitted use and shall not thereafter be reduced or encroached upon in any manner. When a structure is enlarged, the required off-street parking space shall be provided for the enlarged portion. If a use is changed to a different use requiring more space, the additional amount of parking area shall be provided. In addition, the following minimum standards shall apply:

Sec. 3.31 - Parking Space, Off-street: An off-street parking space shall comprise not less than 180 square feet of parking area, plus necessary maneuvering space. Space for maneuvering incidental to parking or unparking shall not encroach upon any public right-of-way. Every off-street parking space shall be accessible to a public roadway.

Sec. 3.32 - Residential Dwelling: One (1) parking space for each room or unit.

Sec. 3.33 - Tourist accommodations: One (1) parking space for each room or unit.

Sec. 3.34 - Theatre, stadium, auditorium, church, or other places of public assembly: one (1) parking space for each five (5) seats, based on maximum seating capacity.

Sec. 3.35 - Stores and other retail business establishments: one (1) parking space for each one hundred (100) square feet of total floor area. (Square footage is to be based on all but retail storage).

Sec. 3.36 - Office buildings: one (1) parking space for each two hundred (200) square feet of office floor area.

Sec. 3.37 - Industrial, manufacturing or wholesale establishments: one (1) parking space for each three (3) workers, based on peak employment.

Sec. 3.38 - Restaurants, supper clubs, taverns and bars. One (1) parking space for each five (5) seats, based on maximum seating capacity.

Sec. 3.39 - Off-street parking areas, whether public or private, for more than five (5) vehicles shall be effectively screened by a fence, wall, or evergreen plant material, if visible from a residential or public zone district. All public or private parking areas shall be separated from the right-of-way of any public road or street by means of a sod strip not less than three (3) feet in width between the right-of-way line and the parking area.

Sec. 3.40 - Shoreland Regulations as Provided by Law from the Department of Natural Resources Shoreland Management Minimum Shoreland Standards.

Sec. 3.41 - Designation of Types of Land Use

In order to guide the wise development and utilization of shorelands (1,000 feet from lakes, ponds, and flowage; and 300 feet on each side of rivers and streams) of public waters for the preservation of water quality, natural characteristics, economic values and the general health, safety and welfare, all public waters in the unincorporated areas of Koochiching County, Minnesota have been given a public waters

classification, and uses of shorelands in these classes are hereby designated by land use districts, based on the compatibility of the designated type of land use with the public waters classification.

Sec. 3.42 - Public Waters Classification System

The public waters of Koochiching County, Minnesota, have been classified by the Commissioner of Conservation as follows:

(1) Natural Environment Lakes and Streams: Nett, Pocquette, Franklin, Rat Root, Myrtle, Moose, Seretha, Clear, Dark, Teufer, Cameron, Little Constance, Battle, Beaver Dam Creek, Little Black River, Elm Creek, Hoover Creek, Trout Creek, Valley River, Watrous Creek, and Big Constance Lake. Portions of Big Fork and Littlefork rivers in open space.

(2) Recreational Development Lakes and Streams: Moose

(3) General Development Lakes and Streams: Bartlett, Rainy, and Kabetogama.

Sec. 3.43 - Agricultural Waste Disposal

Any agricultural waste disposal operations in shoreland areas must conform to the standards, criteria, rules and regulations of the Minnesota Pollution Control Agency.

Sec. 3.50 - Shoreland Zoning Provisions

Sec. 3.51 - Lot Size

3.11 For lots newly platted or created by metes and bounds description:

(a) For Natural Environment Lakes and Streams, the minimum lot size shall be 80,000 square feet (approximately 2 acres) and at least 200 feet in width at the water line for lots abutting a public water.

(b) For Recreational Development Lakes, the minimum lot size shall be 40,000 square feet (approximately 1 acre) and at least 150 feet in width at the building line and at least 150 feet in width at the water line for lots abutting a public water.

(c) For General Development Lakes and Streams, the minimum lot size shall be 20,000 square feet and at least 100 feet in width at the building line and at least 100 feet in width at the water line lots abutting a public water.

Sec. 3.52

Furthermore, in addition to Section 3.11, no lot size shall be increased so that the total area of all structures proposed on a lot will be greater than 30 percent of the lot area.

Sec. 3.53 - Substandard Lots

(a) Lots of record in the County Register of Deeds office prior to date of enactment of this ordinance which do not meet the requirements of Section 3.11 may be allowed as building sites provided: such use is permitted in the zoning district, the lot is in separate ownership from abutting lands, and all sanitary and dimensional requirements of the county ordinance are complied with insofar as practical.

(b) The minimum size and length of water frontage shall be:

(1) For Natural Environment Lakes and Streams: at least 60,000 square feet in size and 150 feet in width at the water line for lots abutting a public water.

(2) For Recreational Development Lakes: at least 30,000 square feet in size and 100 feet in width at the building line and 100 feet in width at the water line for lots abutting a public water.

(3) For General Development Lakes and Streams: at least 20,000 square feet in size and 75 feet in width at the water line for lots abutting a public water.

Sec. 3.60 - Placement of Structures on Lots

Sec. 3.61 - Setbacks

All structures, except boat houses, piers and docks shall be setback the following horizontal distances:

- (a) On Natural Environment Lakes, at least 200 feet from the normal high water mark.
- (b) On Recreational Development Lakes, at least 100 feet from the normal high water mark.
- (c) On General Development Lakes, at least 75 feet from the normal high water mark.
- (d) Outside of a floodway as defined in M.S. 5104.02.

Sec. 3.62 - High Water Elevation

In addition to the setback requirements of Section 3.11:

(a) For lakes, ponds or flowages: No structure, except boat houses, piers, and docks shall be placed at an elevation such that the lowest floor, including basement floors, is less than three feet above the highest known water level. In those instances where sufficient data on known high water levels are not available, the elevation of the line of permanent shoreland vegetation shall be used as the estimated high water elevation. When fill is required to meet this elevation, the fill shall be allowed to stabilize, and construction shall not begin until the property has been inspected by the Zoning Administrator.

(b) For Rivers or Streams: Placement of structures shall be in conformance with any applicable local flood plain ordinances. Where no ordinances exist, the elevation of structures shall be determined after an evaluation of available flood information.

Sec. 3.63 - Erosion and Sedimentation Control

No structure shall be placed in any area which will require grading and/or filling which will result in impairment of public waters by reason of erosion and sedimentation, violate provisions of Statewide Standards and Criteria for Management of Flood Plain Areas of Minnesota, or result in impairment of fish and aquatic life. (See Section 3.72)

Sec. 3.64 - Location of structures in relation to side lot lines and roads:

(a) There shall be at least a 10 foot sideyard between any structure and side lot lines.

Sec. 3.65

Boat houses shall be permitted to be located up to the normal high water mark subject to the issuances of a conditional use permit by the County Planning Commission, provided they shall not be used for habitation and they shall not contain sanitary facilities.

Sec. 3.66

Variances to the setback requirements of Section 3.61 and 3.64 may be granted under the following circumstances by the County Board of Adjustment, if not within a floodway:

(a) In areas where development exists on both sides of a proposed building site, water and road setbacks may be varied

to conform to the existing established setbacks, or

(b) In areas of unusual topography or substantial elevation above the lake level, the water setback may be varied to allow a riparian owner reasonable use and enjoyment of his property, or

(c) Where homes incorporate a method of sewage disposal other than soil absorption, water setbacks specified in Section 3.61 may be reduced by one-third (1-3).

Sec. 3.67

Locations of signs and structural appurtenances thereto: All commercial advertising signs shall be of a size, shape and location so as not to be unduly prominent in their surroundings. The regulations of signs hereunder are in addition to the provisions of M.S. 1969 c. 173 and regulations promulgated pursuant thereto.

(a) Signs intended to be read from the water shall be set back to the established structure setback from the normal high water elevation shall be attached to a building and shall not exceed 30 square feet in gross area.

(b) All signs, except the following when they are not more than six (6) square feet in area, shall require a permit to be erected:

- (1) Signs advertising a customary home occupation,
- (2) Temporary signs advertising the sale, rent or lease of property,
- (3) Recreational directory signs.

(c) Prohibited signs are:

- (1) Those which interfere with visibility of drivers or obstruct traffic signs.
- (2) Those which are illuminated by a flashing light or by any light directed toward a neighboring residence or toward the water, except emergency or warning signs.
- (3) Those which are composed of any conspicuous animated part.
- (4) Those which are mounted on a dock or float.

Sec. 3.70 - Shoreland Alterations

Sec. 3.71

The removal of natural vegetation shall be restricted to prevent erosion into public waters, to consume nutrients in the soil, and to preserve shoreland aesthetics. Removal shall be restricted within a strip paralleling the lakeshore and extending inland at specified distances from the normal high water mark. This specified distance will depend upon lake class:

- (a) Natural Environment Lakes and Streams: 100 feet from the normal high water mark.
- (b) Recreational Development Lakes: 50 feet from the normal high water mark.
- (c) General Development Lakes and Streams: 35 feet from the normal high water mark.
- (d) To allow a view corridor to the water, 25 percent of the length of this strip may be clear cut to the depth of the strip. In

the remaining 75 percent of this strip, cutting shall leave sufficient cover to screen cars, dwellings, and other structures, except boat houses, piers, docks and marinas, from view from the lake.

(e) Section 3.71 shall not apply to permitted uses which normally require the removal of the natural vegetation.

Sec. 3.72

Grading and filling in shoreland areas or any alterations of the natural topography where the slope of the land is toward a public water or a watercourse leading to a public water must be authorized by a conditional use permit obtained from the County Planning Commission. The permit may be granted subject to the conditions that:

- (a) The smallest amount of bare ground is exposed for as short a time as feasible,
- (b) Temporary ground cover, such as mulch, is used and permanent ground cover, such as sod, is planted,
- (c) Methods to prevent erosion and trap sediment are employed, and,
- (d) Fill is stabilized to accepted engineering standards.

ARTICLE 4.00 SIGNS AND SPECIAL USES

Sec. 4.11 - Permit Required

Except as otherwise specifically authorized, no sign shall be located, erected, moved, reconstructed, extended, enlarged, or structurally altered within Koochiching County until a permit has been issued by the County Zoning Administrator. No permit shall be issued for a sign not in conformity with the size, type, number, location and use regulations affecting each zoning district.

Sec. 4.12 - Exceptions

A permit shall not be required for the following classes of signs:

- (a) Class A signs: Official traffic control signs, and informational notice erected by federal, state, or local units of government.
- (b) Class B signs: On-premise real estate signs, residential identification, warning and similar signs not greater than 6 square feet in area.

Sec. 4.13 - Prohibited Characteristics of Signs

- (a) No sign shall resemble, imitate, or approximate the shape, size, form or color of railroad or traffic signs, signals or devices.
- (b) No sign shall be so located as to interfere with the visibility or effectiveness of any official traffic sign or signal, or with driver vision at any access point or intersection.
- (c) No sign shall be erected, relocated, or maintained so as to prevent free ingress or egress from any door, window, or fire escape, and no sign shall be attached to a standpipe or fire escape.
- (d) No sign shall contain any rotating or moving parts, or be illuminated by flashing light.
- (e) No sign shall exceed the maximum height limitation of the

district in which it is located.

(f) No sign shall be located on a lot so as to reduce the required dimensional setback and side yard requirements of the district in which it is located.

Sec. 4.20 Classification of Signs Requiring Permit

Sec. 4.21 - Class C Signs:

On premise signs which advertise a business activity or service performed on the property.

(a) Type 1: Signs advertising a permitted home occupation or professional office. Such signs shall not exceed 6 square feet in area, and if illuminated shall be indirectly lighted. No more than one such sign for each use located on the premises shall be permitted.

(b) Type 2: Signs or bulletin boards for public, charitable, or religious institutions. Such signs shall not exceed 12 square feet in area, and no more than one such sign for each highway upon which the property faces shall be permitted. Such signs may be placed at the right-of-way of the highway.

(c) Type 3: Signs advertising a business activity or a service available in a commercial or industrial area. Such signs shall not exceed 80 square feet in area when non-lighted, and if illuminated shall not exceed 40 square feet in area. Not more than one such sign for each story may be attached to a building facade, and no sign may project more than 6 feet beyond a building when attached thereto, or be higher than 4 feet above the top roof line. Free standing signs shall not exceed 20 feet in height from the ground.

(d) Type 4: Signs advertising the sale of farm products produced on the premises. Such signs shall not exceed 24 square feet in area, and no more than 3 non-lighted signs advertising produce may be erected within 100 feet of the stand.

(e) Type 5: Signs advertising a resort or recreational business activity or product available. Such signs shall not exceed 20 square feet in area and no more than one such sign for each highway upon which the property faces shall be permitted.

Sec. 4.22 - Class D Signs:

Signs or billboards which advertise a general brand of product, an area of interest, a business activity or a service available which is not in direct relation to the use of the premises on which it is located. Such signs shall not exceed 300 square feet in area. Free standing signs shall be erected outside a line parallel to and 50 feet from the highway right-of-way, shall not exceed 20 feet in height above the ground or be located within 300 feet of an existing residence.

Sec. 4.23 - Class E Signs:

Off premise directory signs in the specific interest of the traveling public which advertise a business activity, an area of interest or a service available at a specific location within 12 air miles of the premises on which it is located.

(a) Type 1: Recreational directory signs indicating the direction to a cottage, resort, residence or similar use. Such signs shall not exceed 4 square feet in area. When a common posting is provided all such signs shall be attached thereto. Recreational directory signs may be placed at the right-of-way line of the highway provided they are not within 300 feet of an existing residence. Information on such signs may be of reflective material.

(b) Type 2: Signs advertising a business or activity conducted

EXHIBIT 9

SUBDIVISION REGULATIONS, ORDINANCE 33,
ST. LOUIS COUNTY, MINNESOTA

ORDINANCE NUMBER 33

SUBDIVISION REGULATIONS

of

ST. LOUIS COUNTY, MINNESOTA

For additional information contact:

Planning and Zoning Department
Fifth Floor
Court House
Duluth, MN 55802 (Phone 218-723-3441)

Planning and Zoning Department
Room 1
Court House
Virginia, MN 55792 (Phone 218-749-7103)

ST. LOUIS COUNTY SUBDIVISION REGULATIONS

Article I - General Provisions

Section 11 - Title:

This Ordinance shall be known as The Subdivision Regulations of St. Louis County and will be referred to herein as "this Ordinance".

Section 12 - Authority:

This Ordinance has been adopted in accordance with Minnesota statutes, Chapters 394 and 505.

Section 13 - Purpose:

13.01 The intent of these regulations is as follows:

- a. To protect and provide for the public health, safety and general welfare.
- b. To coordinate land subdivision with County and other government land use plans and regulations.
- c. To insure proper legal descriptions and monumenting of subdivided land.
- d. To provide for protection from environmental degradation of the County.
- e. To provide for adequate light, air, and privacy, to secure safety from fire, flood, and other danger, and to prevent overcrowding of the land and undue congestion of population.
- f. To prevent unnecessary public expenditures by discouraging urban sprawl and encouraging use of existing facilities and coordinating new facilities with existing facilities.
- g. To encourage developers to use creative approaches to land development in a manner that protects the environment and prevents adverse physical, social and economic impacts upon the neighborhood, Town and County.

Section 14 - Scope

14.01 This Ordinance shall apply to and be binding upon all the area of St. Louis County outside the incorporated limits of municipalities, excepting this Ordinance shall not apply when:

- a. Subdivisions are proposed within two miles of the corporate limits of a city that has extended such subdivision controls according to Section 462.358, Minnesota statutes. The County and Towns have an interest and responsibility in protecting the public's health, safety and welfare within a city's extraterritorial subdivision jurisdiction. Therefore, the Board may develop measures that encourage coordination of subdivision proposals in such instances.
- b. Urban towns that adopted subdivision resolutions according to Section 505.03, Minnesota statutes.

14.02 This Ordinance shall not apply to any lot or lots forming a part of a subdivision recorded in the Office of the County Recorder prior to the effective date of this Ordinance or to any preliminary plats which have had a public hearing before the Commission, nor is it intended by this Ordinance to repeal, annul or in any way impair or interfere with existing provisions of other laws or ordinances except those specifically repealed by, or in conflict, with this Ordinance, or with private restrictions placed upon property by deed, covenant, or other private agreement, or with restrictive covenants running with the land. Where this Ordinance imposes a greater restriction upon the land than is imposed or required by such existing provisions of law, ordinance, contract or deed, the provisions of this Ordinance shall prevail. This provision does not apply to resubdivision.

14.03 A person shall apply for subdivision plat approval when:

- a. Two or more lots of less than five acres are created.
- b. Any land division requiring a new road.
- c. Resubdivision of a previously approved subdivision.

A person does not have to apply for subdivision plat approval when:

- a. Transfers of interest in land by will or pursuant to court order.
- b. The creation of one lot per twelve month period provided no new road is required, provided all lots created conform with the requirements of the Zoning Ordinance, and provided no more than five lots (starting from the owner who commenced with the divisions) are created in this manner from the original parcel.
- c. The creation of lots of five acres or more with a minimum lot width of 300 feet provided all lots created conform with the Zoning and Sanitary Ordinances and all such lots are along an improved publicly maintained road.

Section 15 - Minimum Requirements:

The requirements listed in this Ordinance shall be construed as minimum requirements and the County Board shall have the authority to impose additional reasonable standards to protect the public's health, safety and general welfare.

Section 16 - Regulation Waivers:

Where the Commission finds that, due to the special circumstances of a particular proposal, the provision of certain required improvements is not requisite in the interest of the public health, safety and general welfare or is inappropriate because of inadequacy or a lack of connecting facilities adjacent or in proximity to the proposed subdivision, it may waive such requirements subject to appropriate conditions, provided that such waiver will not have the effect of nullifying the intent and purpose of the Comprehensive Plan, the Zoning Ordinance, or this Ordinance.

In granting waivers, the Commission may require such conditions as will, in its judgement, secure substantially the objectives of the standards or requirements so waived. A waiver may only be approved if both of the standards listed below can be met.

- a. That there are special circumstances or conditions affecting said property such that the strict application of the provisions of this Ordinance would deprive that applicant of the reasonable use of his land or have an adverse impact upon the environment.
- b. That the granting of the waiver will not be detrimental to the public welfare or injurious to other property in the vicinity of the property being developed or for future residents of proposed subdivision.

Section 17 - Public Hearings and Notification:

- 17.01 Public hearings are required for all subdivision proposals. Property owners within one-half mile of a proposed subdivision shall be notified of the hearing. The County shall make a reasonable effort to notify property owners.
- 17.02 The Board hereby designates the Commission as the body responsible at the County level to hold public hearings for all subdivisions. Public hearings shall be held at the preliminary plat stage.

Article II - Definitions

21.01 For the purpose of this Ordinance, certain terms and words are hereby defined. The word person includes a firm, association, organization, partnership, trust, company, or corporation, as well as an individual; the present tense includes the future tense, the singular number shall include the plural and the plural the singular; the word shall is mandatory, and the word may is permissive; the words used or occupied include the words intended, designed or arranged to be used or occupied.

21.02 Other words or terms as used in this Ordinance have meanings given them in this section as follows:

Access: A way of approaching or entering property without trespassing upon another person's property.

Alley: A way used primarily as a service or secondary access to the rear or side of a property which abuts on a street.

Angle of repose for saturated soil conditions: The angle of maximum slope at which the soil is stable.

Attorney: The St. Louis County Attorney or authorized representative.

Auditor: The County Auditor of St. Louis County or authorized representative.

Block: An area of land within a subdivision which is usually bounded by roads or other permanent barriers including water courses, permanent open spaces and railroad tracks.

Board: The St. Louis County Board of Commissioners.

Commission: The St. Louis County Planning Commission

Comprehensive Plan: A document or series of documents adopted by the Board or Town setting forth policies for the future development of the County, portions of the County or Towns.

Concept Plan: A drawing to rough scale showing a developer's initial ideas regarding a proposed subdivision.

Corner lot: A lot located at the intersection of two or more streets having an angle of intersection of not less than 70 degrees.

County: St. Louis County, Minnesota.

Covenant Deed Restriction: A private legal restriction on the use of land contained in the deed to the property or otherwise formally recorded.

Critical erosion areas: Areas subject to accelerated erosion, especially those contributing to the siltation of wet lands and the sediment load of streams.

Cul-De-Sac: A local street with only one outlet and having an appropriate turn-around for the safe and convenient reversal of traffic movement.

Debris basin: A barrier or dam built across a water course to retain rock, sand gravel, silt or other material.

Dedicate: The voluntary giving of private property for some public or community use by the developer.

Developer: Any person proposing to subdivide property.

Director: The Director of the St. Louis County Planning and Zoning Department or designated representative.

District: Either the North or the South St. Louis County Soil and Water Conservation District.

Driveway: A way not designed or intended to serve as a road; rather a driveway provides access for not more than two dwellings or other principle uses to a road at a density not higher than two dwellings per quarter quarter section or government lot.

Easement: A nonpossessing interest held by one person, group, or government in land of another person whereby the first person, group or government is accorded partial use of such land for specific purposes. Easements fall into three broad classifications: surface easements, subsurface easements, and overhead easements.

Engineer: The County Highway Engineer of St. Louis County or authorized representative.

Environmental Review: Procedures required in the preparation of Environmental Assessment or Environmental Impact statements as set forth by the Minnesota Environmental Quality Board and/or St. Louis County.

Erosion: The wearing away of land surfaces by the action of wind, water, gravity, or any combination thereof.

Final Plat: A drawing, in final form, showing a proposed subdivision containing all information and detail required by state statutes and by this Ordinance to be presented to the Board for approval and which, if approved, may be duly filed with the County Recorder.

Flexible zoning devices: Regulations where development is guided through use of density controls rather than traditional zoning lot area requirements.

Flood Plain: The area adjoining a watercourse which has been or hereafter may be covered by flood waters.

Frontage: That portion of a lot nearest the road or a body of water if the lot has water frontage. For the purpose of determining yard requirements on corner lots and through lots, all portions of a lot adjacent to streets shall be considered frontage.

Grade/Slope: The slope of a surface, such as a lot or road with the vertical rise or fall expressed as a percentage of horizontal distance, e.g., a 3% upgrade means a rise of three feet per one hundred feet of horizontal distance.

Grading: Any stripping, cutting, filling, stockpiling, or any combination thereof which shall include the land in its cut or filled condition.

Health Officer: The County Health officer of St. Louis County or authorized representative.

Improvement - Community: Any sanitary sewer, storm sewer, drainage ditch, watermain, roadway, parkway, bridge, sidewalk, pedestrian way, planting strip, or other facility for which the community rather than private individuals may ultimately assume the responsibility for maintenance and operation.

Land disturbing activity: Any construction, excavation, clearing, grading, transporting or other disruption of the soil that may cause or contribute to sedimentation.

Lot: A tract, plot or portion of a subdivision or other parcel of land intended as a unit for the purpose, whether immediate or future, of transfer of ownership or for building purpose. A lot may be created as a part of a subdivision, metes and bounds description, or other device used for description.

Lot, Corner: A lot abutting upon two intersecting streets.

Lot of Record: A lot which is part of a subdivision recorded in the Office of the County Recorder or Registrar of Titles of St. Louis County, Minnesota, or a lot or parcel described by metes and bounds, the description of which has been lawfully created and recorded prior to the date of enactment of this Ordinance or amendments thereto provided that a lot on tax forfeited lands which has been leased out by the County prior to the date of enactment of this Ordinance shall be considered a lot of record even though that lot has not been individually recorded in the Office of the County Recorder or Registrar of Titles.

Lot, Through: A lot having frontage on two non-intersecting streets.

Lot Width: The distance between the side lot lines measured at the building line.

Open Space: An area under community but not necessarily government ownership, which can be used for recreational or aesthetic purposes. Parking lots, roads, residential, commercial and accessory buildings shall not be considered Open Space. Structures intended for recreational purposes may be considered Open Space.

Parcel: The original property that existed prior to creation of lots.

Planned Unit Development: A type of land development utilizing common open space and density controls rather than the conventional lot development. All planned unit developments shall meet the standards set forth in the Zoning Ordinance.

Preliminary Plat: A drawing and related written materials, documents and information required by the Commission in order to adequately review a proposed development.

Private Road or Reserve Strip: A drive, road, way, or strip of land reserved for the use of a limited number of persons or purposes.

Public Walkway: A way designated for use of pedestrian traffic.

Registered Land Surveyor: A surveyor currently registered to practice surveying in the State of Minnesota under Minnesota Statute 326.10.

Resubdivision: Any rearrangement of lot lines in a previously approved subdivision.

Right-of-way: A strip of land occupied or intended to be occupied by a street, crosswalk, railroad, electric transmission line, oil or gas pipeline, watermain, sanitary or storm sewer or for similar public purpose.

Road: A public or private way which affords primary means of access by pedestrians and vehicles to adjacent properties whether designated as a drive, easement, street, avenue, highway, road, boulevard, cartway, or however otherwise designated.

Road, Arterial: A road of considerable continuity, which is used primarily for heavy through traffic between major traffic generation areas.

Road, Forest: A local road where projected traffic volumes are such that the standards set forth for local roads are not necessary to protect the public's health, safety and welfare. Generally forest roads shall be limited to areas of seasonal development or where development is such low density that traffic generation potential does not warrant a wider driving surface.

Road, Local: A minor road which is used primarily for access to abutting properties and is not intended for through traffic.

Road, Major Collector: All roads classified as a major or minor collector by the St. Louis County Highway Department, Minnesota Department of Transportation or an adopted comprehensive plan.

Road, Neighborhood Collector: A road within a subdivision that serves or has the potential of serving as a connection between roads within the subdivision or adjacent lands to other collector or arterial roads.

Sediment: Solid particulate matter, both mineral and organic, that has been moved from its site of origin or is in suspension in water, or is being transported by air, water, gravity, or ice.

Sediment pool: The reservoir space allotted to the accumulation of sediment.

Soil: All unconsolidated mineral and organic material of whatever origin that overlies bedrock and which can be readily excavated.

Subdivision: Land divided or redivided into two or more lots for purpose of sale or long term lease when person leasing the land is permitted to construct a building for residential, commercial or industrial purposes.

Subdivision Design Review Committee: A subcommittee made up of Planning Commission members responsible when designated by the Commission to review concept plans and other subdivision related matters as designated by the Commission.

Surveyor: The County Surveyor of St. Louis County or designated representative.

Temporary protection: Stabilization of erosive or sediment-producing areas by mulching or by installing temporary structures.

Town Planning Commission: The body designated by the Town Board in those Towns with their own planning and zoning authority that has the responsibility to approve subdivisions.

Vegetative protection: Stabilization of erosive or sediment-producing areas by covering soil with:

1. Permanent seeding, producing long-term vegetative cover,
2. Short-term seeding producing temporary vegetative cover, or
3. Sodding, producing areas covered with a turf of perennial sod-forming grass.

Walk and Bikeway: A way designated for use by pedestrians or bicycles.

Watercourse: Any natural or artificial waterway, stream, river, creek, ditch, channel, canal, conduit, culvert, drain, gully, ravine or wash in which water flows in a definite direction or course, either continuously or intermittently, and which has a definite channel, bed and banks, and shall include any area adjacent thereto subject to inundation by overflow or flood water.

Zoning Ordinance: The Zoning Ordinance in effect where subdivision is located.

Article III - Review Procedures

Section 31 - General Provisions

- 31.01 Approval Procedure: All subdivisions shall follow a three step approval process: Concept Plan, Preliminary Plat and Final Plat.
- 31.02 Official Submission Date:
- a. Concept Plan: A complete Concept Plan may be submitted at any time and acted upon within: 15 days.
 - b. Preliminary Plats: A complete preliminary plat application shall be submitted at least 45 days prior to the Planning Commission meeting at which the applicant desires to have the application heard.
 - c. Final Plats: A complete final plat application shall be submitted at least 75 days prior to the County Board meeting at which the application is to be heard.
- 31.03 Coordination with Minnesota Environmental Quality Board Requirements: No subdivision may proceed beyond the Concept Plan stage when it has been determined that an Environmental Review is required in accordance with State regulations. The subdivision may proceed after completion of the Environmental Review and it shall reflect the results of the review. Determination of the need for an Environmental Review shall be made at the Concept Plan phase. (See appendix for items falling under Environmental Review.)
- 31.04 Coordination of flexible zoning devices with Subdivision Plat approval. (See appropriate provisions in Zoning Ordinance.)
- a. Only one application shall be required when a subdivider utilizes flexible zoning devices such as Planned Unit Developments.
 - b. The application and approval process shall conform with the intent of both regulations and be formulated so that such applications be approved in an efficient and orderly manner.
 - c. This provision shall not be in effect within towns that have their own zoning authority unless that town develops a means to coordinate flexible zoning with subdivision plat approval.
- 31.05 Moratoriums: The Board on a majority vote may by resolution approve a moratorium on subdivision platting whenever a comprehensive plan is actively being prepared for an area. The following shall apply for moratoriums:
- a. The Commission shall hold a public hearing on proposed moratoriums prior to Board action.
 - b. The moratorium shall be for a specific period of time not to exceed six months, unless an extension is approved.

- c. The Board after a public hearing may extend the moratorium for an additional six months beyond the original six month period, provided that significant progress is being made in plan preparation and implementation. No additional extensions shall be approved by the Board.

31.06 Length of Approval: Unless the Director grants an extension, approvals of Concept Plans and preliminary plats are valid for one year from time of approval.

31.07 Appeal of Decisions:

- a. If the developer disagrees with the Concept Plan comments, the developer may proceed with the preliminary plat without incorporating the comments. The developer should explain in the preliminary plat application the reasons for not incorporating the comments.
- b. Decisions made by the Commission may be appealed to the Board. Notice of the intent to appeal shall be submitted to the Director within 30 days of the Commission's decision.
- c. Decisions and interpretations made by the Director may be appealed to the Commission.

31.08 Alterations in Subdivision Design:

- a. Unless an appeal is made and granted there shall be no change in the final plat submitted to the Board from the intent of the Commission's approved preliminary plat.
- b. Once a final plat is recorded there shall be no changes in a subdivision that will result in an increase in number of lots, reduction of common areas, relocation or new construction of roads, or alteration in deed restrictions specifically required by the Board as a condition of plat approval, unless a rearrangement is approved by the County.

Section 32 - Concept Plan Requirements

32.01 Discussion of Requirements: Prior to submission of a Concept Plan, the developer should discuss with the Director the requirements for plat approval. In addition, when the proposed subdivision is located in a Town that is not under County zoning requirements, the developer shall discuss with the appropriate Town official the applicable zoning requirements.

32.02 Concept Plan Application Contents:

- a. Applications for a Concept Plan shall be on an application form approved by the Commission and shall include the following:

1. Name, address, and phone number of the property owner, the developer and, if available, the registered land surveyor, and the developer's attorney, and subdivision designer.
 2. Existing zoning, and if land is not under County zoning, a listing of applicable lot dimension requirements.
 3. Listing of all existing and proposed restrictive covenants and easements if known by the developer.
 4. Total approximate acreage of parcel.
 5. Listing of proposed uses within the subdivision and intended road classifications.
 6. General soils information from the Soil Conservation Service or, if available, percolation test rate results and other developed soils information.
 7. Other reasonable and pertinent information as may be required by the Director.
- b. A map of the proposal drawn to a rough scale of not less than 1:200 shall be submitted with the application form and such map shall contain the following:
1. Legal description.
 2. Name of proposed subdivision.
 3. Graphic scale.
 4. Date of preparation.
 5. North arrow.
 6. Number, location and approximate acreage of lots.
 7. Water courses and significant natural features.
 8. Location of proposed street rights-of-way.
 9. Approximate location of existing structures on property.
 10. Location of any areas intended to be set aside for public or community purposes.
 11. Topography showing contours at 10 foot intervals.
 12. Adjacent lands owned by the applicant.
 13. Location of percolation test holes, if available.

14. Other reasonable and pertinent information as may be required by the Director.

32.03 Concept Plan Review

- a. The Director shall submit Concept Plan copies to the following agencies:
 1. County Health Department
 2. County Highway Department
 3. Town where subdivision is located
- b. The Director shall have 15 working days to review a Concept Plan and return comments to the developer. The Highway and Health Departments shall send to the Director any comments they may decide to make within 10 working days of receiving a Concept Plan.
- c. The Director may require a revised Concept Plan if during review numerous revisions are required.
- d. The Director shall forward a copy of the final Concept Plan and appropriate comments to the Town where proposal is located.

Section 33 - Preliminary Plat Requirements

- 33.01 Applications shall be on a form developed by the Commission and fifteen copies shall be submitted.

33.02 The following information shall be submitted in written form:

- a. Names, addresses and phone numbers of the property owner, developer, designer, registered land surveyor and attorney.
- b. Preliminary title opinion that contains an explanation of existing and proposed deed restrictions, easements, as well as details on all ownership interests and liens upon proposed and/or existing: roads (including explanation of access to property if not by publicly maintained road), right of ways, public walkways, parks and open space, and other proposed community and public areas.
- c. General soils information from the Soil Conservation Service or, if available, percolation test results or any other specific soils information.
- d. Statement on method of sanitary waste disposal and water system to be used.
- e. Explanation of proposed or prohibited uses within the subdivision as proposed by the developer.

- f. When required by the Commission, an erosion control plan that addresses erosion control during and after construction.
- g. When required by the Commission, a plan for vegetative preservation and landscaping.
- h. Name, address and location of fire department responsible for providing protection.
- i. Explanation of proposed road maintenance responsibility.
- j. Explanation of any future subdivision or staged development plans.
- k. Other information as may be required by the Director or Commission.

33.03 The following information shall be on a map(s) drawn to a scale of not less than 1:100.

- a. Proposed name of subdivision which shall not duplicate or be similar in pronunciation or spelling to the name of any plat heretofore recorded in the County.
- b. Legal description of parcel.
- c. Individual approximate lot dimensions and acreage.
- d. Approximate location, right-of-way, curve radii, radius and length of cul-de-sacs, street grades where grade exceeds 8%, angle of intersections of all existing and proposed streets.
- e. Graphic scale and north point.
- f. Index map drawn to suitable scale showing that part of the section in a manner that properly determines the location of the subdivision.
- g. Date of preparation.
- h. Street profiles (may be on separate map) where proposed street grades exceed 8% when required by the Director.
- i. Topographic data showing contour intervals of ten feet.
- j. Lot layout, block and lot numbers, and areas set aside for public and community purposes.
- k. Major drainageways.
- l. Soils map showing soil types, rock outcrops, water courses, marshes, and wooded area. U.S.G.S. topographic maps and

information from the Soil Conservation Service may be used unless the developer has access to more detailed information.

m. Other information as required by the Director or Commission.

33.04 Field markings of subdivision. The developer shall place in the field posts, stakes or flags showing the approximate outer boundaries of the subdivision.

33.05 Preliminary Plat Review Process.

- a. The following shall receive a copy of the Preliminary Plat: County Health, Surveyor, and Highway Departments, Township where plat is located, Townships or cities within two miles of proposed subdivision, fire department, school district, Minnesota Department of Transportation when proposal is adjacent to a State highway, Minnesota Department of Natural Resources when proposal may not conform with Shoreland Regulations or involves a Planned Unit Development.
- b. Those receiving a copy of the Preliminary Plat should make recommendations to the Director within the review period.
- c. Adjacent property owners shall be notified of the proposed subdivision and public hearing at least ten days prior to the hearing.
- d. The subdivision shall be considered at a public hearing scheduled for the first regularly scheduled Commission meeting after the expiration of the 45 day review period.
- e. The Commission after the conclusion of the public hearing shall make a determination regarding the proposal. The Commission may take any one of the following actions:
 1. Reopen the public hearing requiring the developer or Director obtain additional information.
 2. Recommend approval of the subdivision with conditions.
 3. Recommend denial of the subdivision on specific grounds.
 4. Recommend approval of the proposal as submitted.

33.06 Effect of Approval. Approval of the preliminary plat is an acceptance of the general layout and indicates that the developer may proceed toward fulfilling the necessary steps for final plat approval in accordance with the terms of approval. Such approval does not constitute final acceptance of the subdivision.

Section 34 - Final Plat Requirements

34.01 Revised Preliminary Plat: The Director may require the developer to submit a revised preliminary plat based on the Commission's

approval if such a copy is needed to insure that the intent of the Planning Commission approval is being followed. If the Director and developer disagree as to the intent of the Commission's approval the developer or Director may submit the revised copy to the Commission for final determination of intent.

- 34.02 Application for final plat approval shall be on forms approved by the Commission and shall conform with all previous approvals.
- 34.03 Prior to preparation of the plat for recording the developer shall submit five copies of the following:
- a. Preliminary title opinion detailing all existing mortgages, liens and easements that affect the property together with an updated abstract of title or a certificate of title together with a registered property certificate.
 - b. Articles of Incorporation of any required homeowners association.
 - c. Plan for maintenance of improvements prior to government maintenance of such community improvements.
 - d. Copy of any required deed restrictions, easements or purchase agreement requirements.
 - e. Letters of approval of access to private, town, county, state or federal highways from pertinent land owners or agency.
 - f. Name, address and phone numbers of developer, property owner, registered land surveyor, and attorney.
 - g. Statement on method developer will utilize to satisfy improvement requirements.
 - h. The registered land surveyor placing and establishing the corners and/or monuments shall file a certificate to that effect for each section corner, quarter section corner, meander corner or witness corner in the office of the surveyor on a form provided by the surveyor's office.
- 34.04 Five paper prints shall be submitted along with the written statements. The paper prints shall be drawn to scale of not less than 1:100. The prints shall contain the following information:
- a. Data required by Minnesota Platting Statutes.
 - b. A diagram, drawn to suitable scale, showing that part of the section subdivision necessary to properly determine the boundaries of the platted area. The diagram shall show all survey corners found or restored and used in making said subdivision.

It shall be mandatory that all section and/or quarter section corners necessarily used to create boundary lines for a subdivision plat be permanently marked and properly perpetuated. It shall also be mandatory that all meander corners and/or witness corners also be permanently marked and properly perpetuated.

- c. Notarized certification by all owners and by any mortgage holder on record and the dedication of streets and other public or common areas in the form approved by the attorney.
- d. All lot corners shall be marked by either iron pipe or iron rods minimum of $\frac{1}{4}$ inch diameter; where rock exists a chisled "x" or drilled plug may be used.

34.05 Final plat review procedure:

- a. The paper prints and written statements shall comply with the intent of preliminary plat approval. Applications shall be submitted within one year of appropriate approvals unless extension is approved by the Director.
- b. The Director shall submit a copy of the print and appropriate information to the Surveyor, Attorney, Highway Department and Town.
- c. Those receiving the final application shall report back to the Director within 60 days. Comments for each agency shall involve the following concerns:
 - (1) Surveyor shall review conformance with Minnesota Platting Regulations and advise the attorney on survey matters affecting title.
 - (2) Attorney shall review the application to determine if the platted property is in the simple ownership of the developer and all legal documents required by the Commission are adequate to meet the intent of Commission approval.
 - (3) The Highway Engineer shall review the proposed road system and make on-site inspections of completed roads to determine conformance with County and Town approvals. The Engineer shall review and approve any bonds or cashier's checks to determine adequacy.
 - (4) The Director shall review the application to determine conformance with Commission approval.
 - (5) The Town shall review the application to determine conformance with Commission adopted Town requirements.

- d. If during the 60 day review period it is determined that improvements or alterations in the application are necessary the developer shall make such changes. The developer has one year to make such changes and failure to do so within this period shall result in nullification of all previous County approvals. The Director shall have authority to extend the one year period if significant progress is being made by the developer to make necessary corrections in the application.
 - (1) Once the application has been corrected the developer shall reapply for final plat approval and the appropriate agencies shall have 60 days to review the application.
- e. Upon approval of all appropriate reviewing authorities the final plat shall be submitted for the County Board approval no later than 75 days after submission of the final plat application by the developer.
- f. Upon approval by the Board the developer shall submit to the Director three hardshell and one reproducible mylar print or other permanent prints suitable for recording and meeting the requirements set forth in State statute and County policy.
- g. The Director shall submit the plat and fee for recording in accordance with State statute and County policy. Recorder shall not accept any plat not presented for recording by the Director.

Section 35 - Alternate Subdivision Plat Review Procedure

35.01 The following procedure shall be used with any Town that has its own zoning authority.

- a. Prior to submission of the Concept Plan the developer shall discuss with the Town the zoning requirements for the area contemplated for development. The developer shall include the zoning requirements when application for Concept Plan approval is made.
- b. After review of the Concept Plan by the County the developer shall apply for approval from the Town Planning Commission. This approval shall be considered preliminary Town approval.
- c. No application to the County for preliminary plat approval shall be accepted unless Town Planning Commission approval has been given. All applications to the County shall include a statement from the Town demonstrating Town Planning Commission approval. The application shall reflect any conditions of Town approval.

- d. The Commission in reviewing the preliminary plat shall consider Town conditions of approval and the requirements stated in these resolutions. If Commission preliminary approval differs from Town approval the Town Planning Commission may either accept the County recommendations or request a conference with the County Planning Commission to compromise the differing requirements.
- e. Upon reaching an agreement on preliminary approval the Town Planning Commission shall consider final plat approval.
- f. The developer may submit to the County application for final plat approval in accordance with these regulations after Town final approval has been given.
- g. The chairman and secretary of the Town Planning Commission shall sign the plat for recording.

Article IV - Design and Improvement Requirements

Section 41 - Survey

The survey of all plats shall be done in accordance with Minnesota Statutes and policies of the Surveyor.

Section 42 - Lots

- 42.01 Lot arrangement shall be done in a manner that meets the requirements of this Ordinance and the Zoning Ordinance.
- 42.02 Side lot lines shall be near at right angles to street lines as possible.
- 42.03 Dimensions of corner lots shall be of sufficient size to allow for erection of buildings observing the minimum frontyard setback from both streets.
- 42.04 Double frontage lots shall be avoided except where necessary to provide separation of residential development from arterials or major collectors or to overcome specific problems due to orientation of topographic requirements.
- 42.05 Limited access to certain roads. Lots shall not derive access exclusively from an arterial or major collector roads. Where driveway access from an arterial or major collector cannot be avoided, the Commission may require that such lots be served by a combined access drive.
- 42.06 Large lots: In water and sewer service areas where proposed lots are double the minimum lot area requirements, the Commission may require buildings placed so as to permit further lot division.
- 42.07 Outlots shall be set aside solely for nonbuilding purposes and no St. Louis County Land Use Permits shall be issued for structures on outlots. Outlots may be eliminated through resubdivision approved by the County.

Section 43 - Blocks

- 43.01 In residential areas, blocks shall generally not be less than six hundred (600) nor more than fourteen hundred (1,400) feet in length measured along the greatest dimension of the enclosed block area, unless minor variations are necessitated by topography or conformance with adjoining plat. Wherever practicable, blocks along arterials and major collectors shall be not less than one thousand feet in length.
- 43.02 Blocks for commercial and industrial areas may vary from the elements of design contained in this section if the nature of the use requires other treatment. In such cases, off-street parking for employees and customers shall be provided along

with safe and convenient limited access to the street system. Space for off-street loading shall also be provided with similar access. Extension of streets, railroad access right-of-way, and utilities shall be provided as necessary.

- 43.03 For blocks over eight hundred (800) feet in length, the Commission may require one or more public walkways within an easement not less than ten (10) feet in width to extend entirely across the block and at locations deemed necessary at intervals not closer than four hundred (400) feet.
- 43.04 Blocks shall be wide enough to allow two tiers of lots except adjoining a lake, stream, railroad or thoroughfare or where one tier of lots may be necessary because of topographic conditions.

Section 44 - Roads

- 44.01 Access roads leading to a subdivision shall be adequate to handle increased traffic resulting from the proposed subdivision. In those cases where the County or Town determines access roads are not adequate the Commission may require a development be done in stages to allow time to make necessary changes in the access road. The developer shall discuss with the appropriate government possible financial contributions that can be made to assist the government in making necessary improvements. If a government agency does not maintain an access road, specific mechanisms for such maintenance must be approved by the Commission and appropriate Town Board. If an access road is maintained by local government but is not adequate the developer in lieu of a staged development may submit a plan for private maintenance. This plan must be approved by the local government. Should a developer choose not to maintain the access road and no effort is made by the local government to plan improvements to the access road within a reasonable period the Commission may not require a staged development.
- 44.02 Road names shall be sufficiently different in sound and in spelling from other names in the local jurisdiction (or within 10 miles, whichever distance is greater). A road which is planned as a continuation of an existing road shall bear the same name.
- 44.03 Road signs shall be established and paid for by the developer in accordance to State, County or Town standards.
- 44.04 All roads shall be dedicated to the public. Private roads shall only be permitted upon a waiver granted by the Commission and approved by the Board.
 - a. Any private road approved by the Board shall be constructed in accordance with the standards set forth in this Ordinance unless additional waivers are approved.
 - b. No private road shall be approved unless specific mechanisms for road maintenance have been approved by the Board and Town.

- c. The County shall have the authority to approve a private road for a designated period of time prior to the County or Town agreeing to maintain the road.
- 44.05 Roads shall be logically related to the natural topography so as to provide usable lots and specified grades, and to minimize erosion.
- 44.06 The arrangement of roads shall provide for the continuation of roads between adjacent properties if necessary for convenient movement of traffic.
- 44.07 Through traffic on local roads shall be discouraged through layout of such roads.
- 44.08 Half or partial roads will not be permitted within a proposed subdivision when a proposed subdivision is adjacent to a platted half street. The Commission may require the completion of such a street within the proposed subdivision.
- 44.09 Dead-end roads shall be prohibited, except when designed as cul-de-sac roads or as stubs to permit future road extension into adjoining tracts; such stubs shall have a 70 foot radius turn-around.
 - a. When a temporary cul-de-sac is removed as a result of an extension of the former stub road, the land formerly part of the cul-de-sac and not needed for right-of-way shall revert to adjacent property owners.
- 44.10 Cul-de-sac roads shall generally be no longer than 800 feet and shall not serve more than 10 lots. Finished turn-around radius shall not be less than seventy (70) feet.
- 44.11 Road access shall be given to all lots in the subdivision and to adjacent parcels unless topography clearly indicates that such connection is not feasible. Roads shall be improved to the standards set forth in this Ordinance except access intended solely for adjacent unsubdivided parcels do not have to be improved unless so required by the Commission.
- 44.12 Existing private roadways may not necessarily be located to form the most appropriate road system within the proposed subdivision and, therefore, the Commission may require alternate routes and alteration in design in accordance with road requirements set forth in this Ordinance. If the Commission permits continuation of the existing roadway such roadway shall be dedicated to the public unless a waiver is approved by the Commission.
- 44.13 The developer of a proposed subdivision may be required to construct to the nearest publicly maintained road an access road within any dedicated but not constructed right-of-way that abuts the land being proposed for development. The Commission shall

require such construction when it would result in a roadway system that advances the public's safety and general welfare and when future residents of the proposed subdivision would primarily benefit from such construction.

- 44.14 The following road design standards are hereby established and all proposed subdivisions shall implement them unless waivers are approved:

A. Minimum Right-of-Way:

Arterial	200 feet
Major Collector	150 feet
Neighborhood Collector	80 feet
Local and Forest Roads	66 feet
Cul-de-Sac Radius	70 feet

B. Minimum Driving Surface:

All roads except Forest Roads	26 feet
Forest Roads	20 feet

- C. Minimum surface slope from shoulder to center line: $\frac{1}{4}$ inch per foot.
- D. Shoulders and backslopes shall be constructed to a three to one (3:1) ratio. The ditch depth where topography permits shall be a minimum of two feet below the shoulder point.
- E. The Engineer shall approve the road base. The driving surface shall consist of a minimum of six inches Class V gravel. Forest Roads shall have a minimum of four inches of gravel on a stable base. The Engineer on all roads may recommend and the Commission require alternate driving surface requirements due to topographic conditions or projected traffic volumes.
- F. Culverts across roadways shall be a minimum of 15 inches in diameter. The developer shall place all culverts required by the Engineer and such culverts shall be so designed to handle existing and proposed drainage patterns.
- G. Horizontal Curves. Where a deflection angle of more than five (5) degrees in the alignment of a street occurs a curve of reasonably long radius shall be introduced, to-wit: on streets sixty-six (66) feet or more in width, the center line radius of curvature shall be not less than three hundred (300) feet.
- H. Vertical Curves. All changes in grade shall be connected by vertical curves of minimum length in feet equal to fifteen times the algebraic difference in rates of grade for

thoroughfares and one-half this minimum length for other streets. Profiles of all streets showing natural and finished grades drawn to a scale of not less than one inch equals one hundred (100) feet horizontal, and one inch equals twenty (20) feet vertical, may be required by the Engineer if topographic conditions warrant. A 300 foot minimum sight distance shall be provided.

- I. Maximum road grade shall be 10 percent. The Engineer may require road profiles when grades exceed 8 percent.
- J. Roads shall be laid out so as to intersect at right angles. The developer may apply for a waiver when such an intersection is not feasible, but in no case shall an intersection of two roads be at less than 70 degrees.
- K. Intersections shall be designed with a flat grade.
- L. Bridges of primary benefit to the developer shall be constructed at the full expense of the developer according to County and State standards.
- M. Nothing in this Ordinance shall prohibit a Town from establishing more restrictive road standards on those roads which are intended to be a Town maintenance responsibility. When a Town has less restrictive road standards the developer may apply for waivers to construct the planned roads to such standards.

Section 45 - Easements

- 45.01 Utility easements shall be addressed on an individual basis by the developer with the affected utility. It shall be the policy of the Commission that sewer, water, and gas utilities be placed in the road right-of-way while electric utility easements may either be within the road right-of-way or along the adjoining backs of lots. The Commission may require the developer to present evidence that the proper utilities have been consulted. Minimum utility easement width shall be fifteen feet when such easements are not within the road right-of-way.
- 45.02 Walk and bikeway easements may be required by the Commission to facilitate access between lots and provide access to schools, parks, commercial centers and other community activities. These accesses shall be a minimum of ten feet wide.
- 45.03 Water access easements shall be provided on shoreland plats so all lot owners within the plat have access. This access may be under common ownership and does not have to be dedicated to the public. The access shall have a minimum frontage of fifty feet with actual width and area dependent upon potential use of the access as determined by the Commission.

Section 46 - Energy Conservation Guidelines

- 46.01 It is the policy of St. Louis County to encourage development that promotes energy conservation. The following guidelines should be considered by the developer when proposing a subdivision:
- A. Streets and lots should be situated so dwellings may maximize exposure to the south or southeast. Generally, this will result in homes on a long east-west axis with a maximum degree variation of 10 degrees to northwest and 25 degrees to southwest.
 - B. Utilize hills and evergreen trees on north and northwest for wind screening.
 - C. Utilize deciduous trees on south and east for shading.
 - D. The use of cluster subdivisions should be considered.
 - E. Easements assuring light for solar energy for each lot.
 - F. Walk and bikeways to neighborhood commercial and community facilities could be considered or a location set aside for such commercial activity.
 - G. Paving should be minimized adjacent to buildings.

Section 47 - Recreation and Public Lands

- 47.01 Lands designated on a County or Town plan for public purposes and located within a proposed subdivision shall be set aside by the developer for 18 months after final plat recording to permit the appropriate government an opportunity to purchase the land. If no attempt to purchase the property is made within 18 months or the government agency determines there is no longer any need for such land, the developer may subdivide the lots in accordance with the preliminary plan approved by the Commission.
- 47.02 Property owners recreation needs shall be addressed by any developer who divides forty acres or more as a major subdivision by the creation of common recreation areas in accordance with the following table and requirements:

<u>Development Density Based on Average Dwelling Units per 40 Gross Acres</u>	<u>Percentage of Total Land in Subdivision to be Reserved for Recreational Purposes</u>
*10 dwellings per 40 acres or less	0%
*10.1 - 20 dwellings per 40 acres	5%
20.1 dwellings per 40 acres or more	10%

*If additional development is being considered or there is potential for additional development on more than 60 acres, the next highest percentage requirement shall apply.

- A. Subdivisions with lake frontage are exempt from this provision provided all lots proposed have water frontage.
 - B. Wetlands, ponds and land with slopes in excess of 15% may be used for recreational areas only upon specific approval by the Commission, and not more than 50% of the recreational area may include such land. In addition, all recreational areas shall be readily accessible by all subdivision residents.
- 47.03 Cash in lieu of dedication. Whenever the Commission determines that an area's recreation would best be served by improving an existing or planned central recreation facility, a cash payment may be made in place of reserving land within the subdivision.
- A. The Board by resolution shall determine the level of payment on a per lot created basis.
 - B. All payments received from the developer shall be set aside in a special account that can solely be used for recreational needs of residents of the area in which the subdivision is located.
- 47.04 Effectuation. Sections 7.02 and 7.03 shall take effect upon resolution by the appropriate Town Board or County Board within unorganized Towns.

Section 48 - Preservation of Natural Features and Amenities.

- 48.01 Existing features which would add value to residential, commercial and industrial developments or to the community, such as trees, watercourses and falls, beaches, historic spots and similar irreplaceable assets, shall be preserved in the design of the subdivision.

Section 49 - Health, Safety and Resource Preservation Standards.

- 49.01 Land Suitability: All lots created under this Ordinance which are intended for public, residential, commercial or industrial purposes shall have a suitable site for the intended use, and no lot that for reason of flooding, inadequate drainage, adverse soil or rock formation, unfavorable topography, inadequate water supply or sewage disposal capabilities, or any feature likely to be harmful to the public's health, safety or general welfare shall be created by the Board.
- 49.02 Drainage: Land subject to ponding, poor permeability or containing existing drainageways shall be subject to the following requirements:
- A. Where a subdivision is traversed by an undesignated, unnamed watercourse, drainageway, channel or stream, there shall be provided a storm water easement or drainage right-of-way conforming to the natural course of said watercourse of a

width that will be adequate for the purpose. Wherever possible, it is desirable that the drainage be maintained by an open channel with landscaped banks and adequate width for maximum flow.

- B. Drainageways not included in an easement may be reserved as a common open space area.
- C. If a developer requests and Commission agrees, the developer, as an alternative to 9.02 A and B, may prepare a plan for the problem area. This plan shall be approved by the Commission and shall include adequate engineering data, as well as a timetable for completing the plan.

49.03 Erosion Control Guidelines. No land disturbing activity in conjunction with platting shall be undertaken except in accordance with the following guidelines:

- A. No slope may be graded greater than the angle of repose for saturated soil conditions, unless the soil material on such slope is retained by some adequate erosion controlling structure or other stabilizing measures including, but not limited to, drains, rip rap, sod, walls, etc., as approved by the Director. In any event, soil material left exposed shall be provided with a ground cover sufficient to restrain erosion within 20 working days of completion of any phase of soil disturbing activity.
- B. Whenever land-disturbing activity is undertaken on a tract comprising more than one contiguous acre, a ground cover sufficient to restrain erosion must be planted or otherwise provided within 20 working days on that portion of the tract upon which further active construction is not being undertaken, provided that this subsection shall not apply to cleared land forming the basin of a reservoir later to be inundated.
- C. The subdivision plan shall be fitted to the topography and soils so as to create the lowest erosion potential.
- D. Natural vegetation shall be generally retained and protected and when such vegetation is not retained or sufficient to restrain erosion, revegetation shall be established.
- E. Only the smallest practicable area of land shall be exposed at any one time during development.
- F. Sediment basins (debris basins, desilting basins, or silt traps) shall be installed and maintained to remove sediment from run-off waters from land undergoing development.
- G. Provisions shall be made to effectively accommodate the increased run-off caused by changed soil and surface conditions during and after development.

- H. The permanent final vegetation and structures shall be installed as soon as practicable in the development.

49.04 Erosion Control Plan

In areas subject to high erosion the Commission may require a specific erosion control plan and implementation of the plan. The plan shall include the following:

- A. Existing physical features including but not limited to existing water courses, lakes, structures, road and vegetative cover of the site and on land adjacent to the site.
- B. Existing contours with intervals as required for preliminary plat application.
- C. Proposed improvements of the site, including present development and future use, if known, and proposed changes to the land surface and vegetative cover.
- D. Cross-section diagrams of areas of cuts and fills.
- E. A storm water removal system, including culverts, piping, ditches, sediment basins, diversions or other devices, any non-vegetative protection or support including paving, rip-rap, walls or other structures or surfaces, and any vegetative measures in connection with, or as part of, the proposed work.
- F. Facilities for erosion control during and after construction.

49.05 Sanitary Waste Disposal Performance Standards.

- A. When required by the Director or the Health Department, the developer shall perform percolation tests or furnish soils data as required by and complying with the standards of the Health Department. The test standards listed below shall be used unless specifically altered by the Director.
 - 1. Test holes to a three foot depth shall be provided every three lots or where soil characteristics change. Percolation tests may be required if specified by the Director or the Health Department.
 - 2. Six foot test hole every twelve lots at lowest point (minimum - two per subdivision).
 - 3. Test holes shall be left open but suitably covered to prevent accidents and the Director or Health Department notified in writing that the holes are available for inspection. Inspection shall be made within ten (10) working days after notification after which the holes shall be filled by the developer.

B. All lots created shall conform to the following performance standards which are based on the existence of the following limiting factors on each lot:

1. Individual lot water supply.
2. Percolation rate greater than 60 minutes per inch or less than .1 minutes per inch.
3. Water table within five feet of surface.
4. Slope in excess of 20%.
5. Bedrock generally within three feet of surface.

Whenever one or more of the listed limited factors exist on a lot such lots shall have the following minimum lot sizes. Zoning and other conditions may require more stringent requirements than resulting from these standards:

1. Minimum lot area of one acre with a minimum lot width of 150 feet if one limiting factor present.
2. Minimum lot area of two acres with a minimum lot width of 200 feet if two limiting factors are present.
3. Minimum lot area of 4.5 acres with a minimum lot width of 300 feet if three limiting factors are present.

C. The existence of four limiting factors may result in denial of the proposal.

D. Whenever a Town has adopted more restrictive sanitary regulations, those requirements shall be in effect. The developer shall make all necessary tests in this section and the results forwarded to the Director, appropriate Town Sanitarian and County Health Department.

49.06 Water and Sewer Systems

- A. Proposed subdivisions located within the service area of or within a reasonable distance of a public water or sewer system shall at the time of the preliminary application consult with the appropriate utility regarding extension of services to and construction of such services with the subdivision. Both water or sewer systems shall be constructed to the requirements of the appropriate utility and to appropriate State or Federal standards. The system shall be constructed at the expense of the developer.
- B. When proposed by the developer or when required by the County, a common water or sewer system shall be constructed by the developer. Such systems shall meet all pertinent County,

State or Federal requirements. A public utility, sanitary district or homeowners association shall be organized for the purpose of operation and maintenance of such common systems and appropriate legal covenants recorded.

- C. Individual on-site water supply or sewage treatment systems shall meet all pertinent County or State requirements.

Article V - Assurance of Performance and Completion.

Section 51 - Improvements, Bond and Cashier's Checks, Acceptance of Dedication Offers.

51.01 Completion of Improvements. Before the plat is signed by the Chairman of the County Board, all developers shall complete, in accordance with the Planning Commission's decision and to the satisfaction of appropriate government agencies, all improvements as required in this Ordinance and as approved by the Planning Commission, and to dedicate to the public, free and clear of all liens and encumbrances on the property and public improvements required to be so dedicated.

51.02 Performance Bond and Cashier's Checks.

- a. The Planning Commission may, at its discretion, waive the requirement that the developer complete and dedicate all public improvements prior to the signing of the subdivision plat, and that, as an alternative, the developer post a bond or cashier's check at the time of application for final subdivision approval in an amount estimated by the appropriate government as sufficient to secure the satisfactory construction, installation, and dedication of the incompleeted portion of required improvements. The performance bond shall also secure all lot improvements on the individual lots of the subdivision as required in these regulations. Such performance bond shall comply with all statutory requirements and shall be satisfactory to the County Attorney as to form, sufficiency, and manner of execution as set forth in these regulations. The period within which required improvements must be completed shall be specified by the Board in the resolution approving the final subdivision plat and shall be incorporated in the bond and shall not in any event exceed one year from date of final approval. An extension may be granted for one additional year by the Board if the bond or cashier's check is adequate to meet the costs of improvements.
- b. The amount of the bond and cashier's check shall be reviewed by the Director who shall have the authority to adjust the bond totals if the amount is not reflective of projected costs.
- c. If improvements have not been installed within the terms of such performance bonds or cashier's check, the local or County government may bring actions for recovering or forfeiture of the bond.

51.03 Release of Performance Bond or Cashier's Check.

- a. Upon completion of all required improvements, the developer shall notify the Director in writing. The Director shall, within a responsible period of time, arrange for inspection

of improvements. The Director shall notify the appropriate Town upon receiving the notification. The Town shall have 10 days to make any inspection of its own. If all improvements are satisfactorily completed, the performance bond or cashier's checks shall be released.

- 51.04 Acceptance of Dedication Offers. Acceptance of formal offers of dedication of streets, public areas, easements, and parks shall be by resolution or other appropriate action of the local governing body. The approval by the Planning Commission of a subdivision plat shall not be deemed to constitute or imply the acceptance by any government of any street, easement, or park shown on said plat. The Planning Commission or County Board may require said plat to be endorsed with appropriate notes to this effect.

Section 52 - Maintenance of Improvements

- 52.01 The developer at the time of preliminary plat submission shall provide a plan for maintenance of improvements until the appropriate government agrees to accept the improvements for maintenance. The plan shall be approved by the Planning Commission and the Attorney.
- 52.02 The developer shall be responsible for maintenance of improvements either through a homeowners' association or through other arrangements approved by the Attorney.

Section 53 - Deed and Purchase Agreement

- 53.01 Specific deed restrictions or informational statements on purchase agreements may be required by the Commission in order to protect lot purchasers and area residents from environmental and economic hardships. All such restrictions and statements shall be approved by the Attorney.
- A. Upon initial sale of each lot a copy of the purchase agreement shall be sent to the Director.
- B. The purchase price and other confidential data, except purchaser's name and address, may be excluded from submission.

Section 54 - Homeowners' Association

- 54.01 Homeowners' association shall be organized by the developer for any subdivision containing common areas such as recreation areas or private roads unless another mechanism for maintenance is approved by the Board. This association shall be responsible for maintenance and administration of common areas. All associations shall meet the following requirements:
- A. Articles of Association shall be reviewed by the Attorney and recorded.

B. The documents setting forth the duties, responsibilities and liabilities of the association shall be reviewed and approved by the Director and Attorney. All associations shall meet the following minimum standards:

- (1) Membership shall be mandatory for all property owners.
- (2) The association shall be responsible for all taxes, assessments, insurance improvements and maintenance of common property.
- (3) The association shall have suitable means to raise funds to administer duties of the association.
- (4) Provisions for an annual independent audit of the association.
- (5) Access through common areas by emergency vehicles while in pursuit of duties shall be permitted.
- (6) The developer shall submit to each lot purchaser, in nontechnical terms, information regarding association management, assessment and other programs. This information should cover the following: organizational structure of the association, membership and voting rights of homeowners and developer, requirements of dissolution, the formula for the maximum amount of assessments, and methods of enforcement, use of user fees, nature of common property, services provided by the association, architectural and building maintenance requirements.

The ordinance requires a three step review procedure prior to acceptance of the final plat: a concept plan, a preliminary plat, and a final plat. All subdivisions must be submitted to the Minnesota Environmental Quality Board for review at the concept plan stage. Section 32 of the ordinance provides a list of 14 elements necessary for the review, while Section 33 details the preliminary plat requirements and delineates another 13 informational items needed. This preliminary plat is then reviewed by the county health officer, the surveyor, the highway departments and the township where the plat is located. The township fire department and school district also review the plat and if the plat is adjacent to a state highway, the Minnesota Department of Transportation would also be a reviewing party. The Minnesota Department of Natural Resources would also be a reviewer if there is a question of the conformity with the shoreland regulations or if a planned unit development is involved. Likewise, the final plat receives close scrutiny as detailed in Section 34.05 of the ordinance. Article IV of the ordinance details the design and improvement requirements for a subdivision submitted for approval within the county. Section 47 details the dedication of open area or cash in lieu of dedications that are necessary for subdivisions if they meet various strictures levied by the ordinances. Probably one of the most stringent features of the ordinance is Section 49.05B on page 28 of the ordinance, which lists five limiting factors. As each limiting factor is found to exist in the lands to be subdivided, the minimum lot area has to be increased. For example, given a typical lot in the St. Louis County area which would not have an individual lot water supply, with bedrock generally within three feet of the surface and a slope in excess of 20 percent; then the subdivision would be required to have minimum lot areas of 4.5 acres with a minimum lot width of 300 feet because three of these limiting factors were present. If four limiting factors are present, the ordinance states in 49.05 (c), "the existence of four limiting factors may result in denial of the proposal."

Exhibit 10 is the zoning ordinance for St. Louis County. Minimum requirements in terms of lot area, setbacks, lot widths and the like are detailed in the first portion of this ordinance. Other portions of the ordinance of interest are Section B, page 73, which details a whole host of requirements in the event that shoreland alterations are necessary. This would necessitate a conditional use permit from the county. If the plat is for a planned unit development such as a condominium or the like, Section C details a list of requirements that must be met. A Planned Unit Development (PUD) is defined as a housing project consisting of five or more structures located on a single parcel of land that has not been subdivided. Item d (vii) of the ordinances states that cluster PUDs will provide central sewage to each cluster, or to the entire development, which will meet the standards and criteria of the Minnesota Pollution Control Agency or the St. Louis County Health Department, or both.

As demonstrated previously, soil conditions in the subject area are marginal and in many cases limit the use of a septic system or waste disposal. An alternative to the conventional sewage system is the mound system. This system consists of constructing a small hill or mound of dirt to serve as a dispersent or filter field. While making some unbuildable sites buildable, it is costly and generally runs between \$3,000 to \$6,000 versus \$2,000 or \$2,500 for a conventional septic system. This type of system must conform to the Pollution Control Agency rules shown in Exhibit 11 which state under 6 MCAR, paragraph 4.8040-3, Bedrock proximity, that "In no case shall filter material of the soil treatment system be placed closer than three feet to creviced bedrock...." In many cases, this would also preclude the use of the mound system within the study area.

Minnesota state and county regulations are becoming more stringent, their enforcement is noticeably more strict in recent years than in the past period. This is evidenced in St. Louis county by the number of variances to the various ordinance requirements granted and denied as compared to previous years in

EXHIBIT 10

ZONING ORDINANCE
ST. LOUIS COUNTY, MINNESOTA

ORDINANCE NUMBER 24

THE ZONING ORDINANCE
FOR ST. LOUIS COUNTY, MINNESOTA

MINIMUM REQUIREMENTS

General Category	Zone District	Lot Area	Lot Width	Maximum Lot Coverage	Road Setbacks				Lot Line Setbacks						Height Require- ments (1)
					Principal & Major Arterials	Major Collectors	Minor Collectors & Local Roads	Right-of- Way	Side Yard	Rear Yard	Shoreline	Principal	Accessory	Principal	
Forestry- Management	FM	35 Ac.	600'	5%	110'	85'	68'	35'	100'	100'	100'	100'	100'	100'	35'
Forestry Agricultural	FA	17 Ac.	600'	5%	110'	85'	68'	35'	100'	100'	100'	100'	100'	100'	35'
Agricultural	A-1	9 Ac.	600'	5%	110'	85'	68'	35'	100'	100'	100'	100'	100'	100'	35'
Agricultural Rural Residential	AR	4.5 Ac.	300'	10%	110'	85'	68'	35'	50'	50'	50'	50'	50'	50'	35'
Residential	R-1	2.5 Ac.	200'	20%	110'	85'	68'	35'	25'	10'	50'	10'	50'	50'	35'
Residential	R-2	1.0 Ac.	100'	25%	110'	85'	68'	35'	20'	10'	45'	10'	45'	45'	35'
Residential Private sewer and water	R-3 ⁽²⁾	1/2 Ac.	100'	35%	110'	85'	68'	35'	10'	5'	40'	5'	40'	40'	35'
Public sewer		1/3 Ac.	100'	35%	110'	85'	68'	35'	10'	5'	40'	5'	40'	40'	35'
Public water and sewer		1/4 Ac.	75'	35%	110'	85'	68'	35'	10'	5'	40'	5'	40'	40'	35'
Commercial	C ⁽⁴⁾	1/2 Ac.	100'	75% ⁽³⁾	110'	85'	68'	35'	5'	5'	20'	20'	20'	20'	35'
Manufacturing (Light Indus- trial)	M-1 ⁽⁵⁾	2 Ac.	200'	75% ⁽³⁾	110'	85'	68'	35'	25'	25'	50'	50'	50'	50'	35'

(60)

MINIMUM REQUIREMENTS

General Category	Zone District	Lot Area	Lot Width	Maximum Lot Coverage	Road Setbacks				Lot Line Setbacks						Height Requirements
					Principal & Major Arterials	Major Collectors	Minor Collectors & Local Roads	Right-of-way	Side Yard Setbacks	Rear Yard Setbacks	Shoreline Setbacks				
Manufacturing (Heavy Industrial)	M-2 ⁽⁶⁾	4.5 Ac.	300'	75% ⁽³⁾	110'	85'	68'	35'	25'	25'	50'	50'	50'	50'	35'
Open Space	O	2.5 Ac.	200'	5%	110'	85'	68'	35'	50'	50'	50'	50'	50'	50'	35'
Open Space	Q-1	9 Ac.	600'	2%	110'	85'	68'	35'	100'	100'	100'	100'	100'	100'	--
Natural Environment-Lakes and Streams	W-1 ⁽⁷⁾	2 Ac.	200'	10%	110'	85'	68'	35'	20'	10'	50'	10'	200'	200'	35'
Recreational Development Lakes and Streams	W-2 ⁽⁸⁾	1 Ac.	150'	25%	110'	85'	68'	35'	20'	10'	45'	10'	100'	100'	35'
General Development Lakes and Streams	W-3 ⁽⁹⁾	1/2 Ac.	100'	35%	110'	85'	68'	35'	15'	10'	40'	10'	75'	75'	35'

- 1) Height Limitation applies to residential dwelling units only. Height is measured from first floor level to highest point of roof.
- 2) R-3 Residential contains an alley setback in addition to listed setbacks. Alley setbacks = 5 ft. from alley right of way.
- 3) Includes all structures, plus all parking areas, loading areas, and similarly altered ground surfaces.
- 4) Commercial District contains specific criteria for setbacks in addition to those listed above (Refer to Sec. 10(c)(4))
- 5) M-1 District contains specific criteria for setbacks in addition to those listed above (Refer to Sec. 11(c)(4))
- 6) M-2 District contains specific criteria for setbacks in addition to those listed above (Refer to Sec. 12(d)(4))
- 7) W-1 District contains specific criteria for setbacks in addition to those listed above (Refer to Sec. 15(c)(4))
- 8) W-2 District contains specific criteria for setbacks in addition to those listed above (Refer to Sec. 15(c)(4))
- 9) W-3 District contains specific criteria for setbacks in addition to those listed above (Refer to Sec. 17(c)(4))

SEC. 19

Additional Standards Applicable to All Districts and Uses.

- A. The classification of roads conforms to Federal, State and County Highway Department classifications and terminology. Classifications of roads or sections of roads are subject to change from time to time as the result of changes in traffic patterns. The classification system applicable to this Ordinance is available for inspection in the Planning and Zoning Offices.
- B. The minimum lot width, lot area, and setback requirements established herein shall be maintained for the placement of all structures, except as provided in Sec. 19, D, of this Article. Greater lot area per unit may be required if necessary to provide for proper sewage disposal. Any addition attached to a dwelling, or primary structure, shall comply with all minimum setback requirements of the zone district for a dwelling, or primary structure, and the fee charged shall be the same as the fee for a dwelling or primary structure. Any structure in any zone district may have an extended roof line which encroaches upon the minimum side and rear yard setbacks, provided such encroachment shall not extend more than three (3) feet into the required setback distance.
- C. In no case of subdivision shall any lot or parcel be created which does not meet the requirements of this Ordinance.
- D. Regardless of the minimum standards set forth in Sections 3 through 17 of this Article, within any zone district a principal structure shall be permitted to be set back from the rear yard or shoreline a distance equal to the average rear yard or shoreline setback of certain nearby principal structures, plus the greater of ten feet (10') or twenty percent (20%) of the average. To determine the allowable setback for a principal structure for a given lot in a given zone district, the following method shall be used:
 - (1) On each side of the given lot, determine a distance equal to twice the normally required minimum lot width for the given zone district;
 - (2) Measure the rear yard or shoreline setback of each principal structure located within the distances determined in (1) above;
 - (3) Should a lot be encountered within the distances determined in (1) above which does not have a principal structure thereon, the lot shall be considered to have one principal structure thereon and the measured setback shall be assumed to be equal to the normally required minimum setback for the given zone district;
 - (4) Total the measured setbacks and divide by the number of setbacks measured;
 - (5) To the average obtained in (4) above, add 20% of the average or 10 feet, whichever is greater.

E. Each lot on which a structure is to be erected, altered in its exterior dimensions, or moved, shall have frontage on and access to an improved public road, except as follows:

- (1) Such lots to be used for a seasonal or recreational cabin may have alternate means of access, which shall be either a private road, easement of record, or by public water.
- (2) Such lots to be used for other single family residential structures may have permits issued for such use only after lot owner has met the following criteria:
 - (a) The lot owner shall provide to the Director a copy of an easement of record across all lands between the lot in question and an improved public road, which easement shall be in perpetuity and transferable to the successors, heirs and assigns of the lot owner, and which easement shall provide to the lot owner the right of ingress and egress between the lot in question and an improved public road.
 - (b) The lot owner shall sign before a notary public an affidavit, to be supplied by the Director, agreeing to the following:
 - (i) The lot owner shall agree to maintain a private access to the lot, within the easement, at his or her own expense.
 - (ii) The lot owner shall agree to not demand or require any governmental unit to provide a public road or cartway to the lot, nor to have the private access maintained at government expense.
 - (iii) The lot owner shall agree to not demand or require public services such as school bus service, fire protection, and police protection to any point closer to his lot than the intersection of the private access easement and the improved public road to which it connects.

F. For any use, whether permitted or conditional, where an Environmental Assessment, Environmental Assessment Worksheet, or Environmental Impact Statement is required and where St. Louis County is designated as lead agency the proposer shall be required to supply all information requested by the County to complete said documents. Failure to comply with this requirement will invalidate any permit issued and will subject violator to prosecution under Article XI, Sec. 4, C., and Sec. 5.

SEC. 20

Additional Standards Applicable to Certain Districts or Uses.

A. Two family dwellings (duplex) shall be located on a lot which is at least one and one-half ($1\frac{1}{2}$) times the minimum lot area and at least one and one-half ($1\frac{1}{2}$) times the minimum lot width required for a single family dwelling within the zone district in which said dwelling is located.

- B. Multiple-family dwellings shall be located on a lot which is at least twice the minimum lot area required for a single family dwelling in the same zone district or one-half ($\frac{1}{2}$) acre per unit, whichever is greater, and on a lot which is at least twice the minimum lot width required for a single family dwelling in the same zone district.
- C. Solid waste collection stations and public utility structures necessary for the distribution of local utilities, such as small distribution and repeater stations and other equipment buildings which are normally uninhabited, shall be permitted in all zone districts on lots as small as $\frac{1}{2}$ acre provided:
 - (1) That all setbacks normally required for principal structures in the zone district can be met.
 - (2) That there be created on the lot one 10' x 18' parking space for accommodation of service vehicles.
- D. Seasonal cabins on County lease land in the FM and FA zone districts shall be permitted on lots as small as two and one-half ($2\frac{1}{2}$) acres.
- E. In the case of Waterfront zone districts, each lot shall meet the minimum lot width requirements at both the normal high water mark and the building line.
- F. All structures located within W-1, W-2, and W-3 zone districts with the exception of boathouses, piers and docks, shall be placed at an elevation such that the lowest floor, including basement floors, is not less than three (3) feet above the highest known water level.
- G. The County Board has determined that there is a public interest served and a public benefit derived from government road construction and maintenance projects; that time consuming procedures for obtaining permits for extraction and processing of borrow for such public projects causes project delays and increased costs which are contrary to the public interest; and that the general public benefit to be achieved from the opportunity to swiftly establish borrow pit operations in conjunction with government road projects outweighs the need for detailed public hearing review of aesthetic, safety and pollution considerations, provided that standard permits for such borrow pit operations are excluded from certain zone districts of urban density or which have fragile environmental characteristics, and provided sufficient safeguards are attached to the issuance of such standard permits in other districts to minimize potential problems. Therefore, "borrow pits", and "borrow pits and related facilities, including but not limited to crushing, screening, and batching operations", shall be permitted uses in the Forestry Management, Forestry-Agricultural, Agricultural, Agricultural-Rural Residential, Light Industrial, Heavy Industrial, and Open Space zone districts, with the following exceptions:
 - (1) Where there exists one or more residences within 660 feet of the site of a proposed pit, the proposed pit operation use shall be a Conditional Use unless the applicant provides the Director with a signed statement from the owner or occupant of each such dwelling unit to the effect that each owner or occupant concurs with the issuance of a permit for the proposed pit operation. Such statement shall be on a form prepared and supplied by the Director.

B. Shoreland Alterations

1. Grading and filling in shoreland areas or any alteration of the natural topography where the slope of the land is toward a public water, or watercourse leading to a public water, shall be permitted only after a Conditional Use Permit has been approved by the Planning Commission, subject to the following criteria and conditions:
 - (a) Natural vegetation in shoreland areas shall be preserved insofar as practical and reasonable to retard surface runoff and soil erosion, to utilize excess nutrients in the soil, to alleviate pollution problems, and where appropriate to provide sufficient cover to screen cars, dwellings, and other structures from view from the lake.
 - (b) The smallest amount of bare ground shall be exposed as possible, for as short a period of time as possible.
 - (c) Permanent ground cover such as sod shall be established.
 - (d) Accepted methods to prevent or limit erosion and trap sediment shall be employed.
 - (e) Fill material shall be stabilized according to accepted engineering or soil erosion standards.
 - (f) The Planning Commission may require a soil erosion control plan be obtained from the Federal Soil Conservation Service when necessary. It shall be the responsibility of the applicant to provide such plan according to the direction of the Planning Commission.
 - (g) The applicant shall submit with the application a detailed site and grading plan, drawn to scale, showing the proposed project site and surrounding area from an aerial view, and showing all relevant topography, elevations and cross sections of the area to be excavated or filled, and any other information the Planning Commission may require.
 - (h) Any work which will alter the bed of a public water by changing or diminishing the course, current or cross-section must be approved by the Minnesota Commissioner of Natural Resources before the work may be initiated. No Conditional Use Permit application shall be recommended for approval to the County Board until the applicant has received such approval where required.
 - (1) Work requiring such approval includes construction of channels and ditches, lagooning, dredging of lake bottom for the removal of muck, silt or weeds, and filling in the lakebed including low-lying marsh areas.
 - (11) Work requiring such approval also includes excavations on shorelands where the intended purpose is connection to a public water, such as boat slips, canals, lagoons and harbors.

C. Planned Unit Development (P.U.D.)

1. For any housing project consisting of five or more structures to be erected on a single tract or parcel of land not subdivided into

the customary streets and lots, including a mobile home park or resort, or where existing or proposed street and lot layout of a condominium or cluster subdivision make it impracticable to apply the requirements of this Ordinance to individual structures or lots in such a development, an application for a Planned Unit Development permit shall be made to the Planning Commission, which shall apply following criteria in making its decision:

- (a) The tract shall contain at least 3 acres.
- (b) The Planning Commission shall insure that the use of the structures will be only for the uses stated in the application, and related accessory uses.
- (c) The Planning Commission shall insure provision of off-street parking as specified in this Ordinance.
- (d) The Planning Commission may allow a density of up to twice the normal density (up to $\frac{1}{2}$ the total lot area, road frontage, and shoreline frontage per dwelling unit) allowable within the zone district. In order for a housing P.U.D. to qualify for consideration for higher density, it shall meet the following design standards.
 - (i) the development shall consist of a cluster or several clusters of closely grouped dwelling units
 - (ii) the minimum size development which may be considered for higher density shall be ten (10) units
 - (iii) fifty percent (50%) of all land area in a cluster subdivision shall be in the common ownership of a property owners' association consisting of all owners of the lots or dwelling units within the subdivision.
 - (iv) fifty percent (50%) of the land area in any housing P.U.D. which is not a subdivision shall be dedicated as undeveloped open space or as a recreational area, for use by the residents within the development
 - (v) a complete development plan for use of the common property in any cluster subdivision, or of the dedicated open or recreation area in any other type of housing P.U.D., shall be provided with the application
 - (vi) no commercial use shall be made of the common or dedicated property
 - (vii) cluster P.U.D.'s shall be required to provide central sewage to each cluster, or to the entire development, which shall meet the standards and criteria of the Minnesota Pollution Control Agency or the St. Louis County Health Department, or both
 - (viii) in shoreland areas fifty percent (50%) of the shoreland shall be preserved in its natural state
 - (ix) in cluster subdivisions in shoreland areas all of the shoreline shall be common land
 - (x) in shoreland areas active water oriented facilities such as boat docks, swimming areas, etc. shall be grouped. No cluster shall have more than one (1) of each type of such water oriented facilities. The minimum size cluster with its own shore facilities shall be ten (10) dwelling units.
 - (xi) In shoreland areas, the Planning Commission shall allow higher than normal density only where the higher level of development is consistent with the physical capabilities of the lake to adequately serve the public use.

- (e) All preliminary plans for cluster or condominium subdivisions abutting a public water shall be approved by the Commissioner of Natural Resources before receiving a favorable recommendation from the Planning Commission.
- (2) For any shopping center on a single parcel or tract of land consisting of a grouping of two or more commercial establishments under separate ownership, or under common ownership but leased, rented or managed by two or more separate operators, an application for a Planned Unit Development shall be submitted to the Planning Commission which shall apply the following criteria in making its decision:
- (a) The tract or parcel contains not less than five (5) acres.
 - (b) The land is in a commercial zone district, or has received a Highway Commercial or Neighborhood Commercial use permit.
 - (c) The proposed center is located so that reasonably direct traffic access is supplied from the thoroughfares and where traffic congestion will not likely be created by the proposed center on adjoining roads or streets.
 - (d) The Plan provides for a grouping of buildings of harmonious design, together with adequately arranged traffic and parking facilities according to the provisions of this Ordinance.
 - (e) The plan provides for adequate landscaping of grounds both for aesthetic purposes and for control of drainage so that it shall not adversely affect neighboring properties.
- (3) For any industrial park on a single parcel or tract of land consisting of two or more industrial uses under separate ownership, or under common ownership but leased, rented or managed by two or more separate operators, or for any subdivision used or designed to be used as an industrial park, an application for a Planned Unit Development permit shall be submitted to the Planning Commission which shall apply the following criteria in making its decision:
- (a) The tract to be developed shall contain not less than twenty (20) acres.
 - (b) The plan shall provide for a grouping of buildings of harmonious design having properly arranged traffic ways, parking and loading facilities, adequate landscaping of grounds both for aesthetic purposes and for control of drainage so that it shall not have any significant adverse effect on the neighboring properties.
 - (c) The proposed project shall have direct access to at least one (1) Principal or Minor Arterial, or Major Collector having a year round nine (9) ton per axle capacity.
 - (d) The tract shall lie within an Industrial zone district.
 - (e) All uses proposed shall be listed as permitted or conditional uses within the zone district wherein the tract lies.
- D. For subdivisions intended for year around homes, with lots which are not served by improved public roads as defined herein, the Planning Commission shall apply the following conditions:

- (a) At the time of establishment of the subdivision there shall also be established, through articles of incorporation, bylaws, and any other necessary legal documents, a property owners' association consisting of all of the owners of lots within the subdivision. Such documents shall provide for common ownership of the road system within the subdivision by all of the property owners, and shall provide that the property owners' association shall be responsible for maintaining the road system at the association's own expense.
- (b) At the time of establishment of the subdivision, a road system shall be constructed as prescribed by the Subdivision Platting Ordinance for St. Louis County. Such road system shall connect to an improved public road.
- (c) The property owners' association shall maintain said road system in such condition that it is driveable and passable by general purpose, public, and emergency vehicles on a year around basis.

E. Borrow Pits

- (1) The applicant shall file with the Director an application on a form to be supplied by the Director. Information to be submitted with the application shall include the following:
 - (a) A detailed statement of the purpose and extent of the proposed work, including the volume of material to be excavated;
 - (b) A detailed scale drawing or plan of the property described in the application, and of a sufficient amount of surrounding property, explaining and showing:
 - (i) The horizontal dimensions of the property described in the application;
 - (ii) The area to be excavated;
 - (iii) The location, size and use of any structures on the premises;
 - (iv) The method and location of disposal of any topsoil, vegetation and other debris which will result from the operation;
 - (v) The existing contour lines of the proposed pit site, at a scale of not more than 100 feet to the inch with contour intervals not to exceed five (5) feet;
 - (vi) Existing and proposed drainage on the pit site, and from the pit site for a distance of 1/4 mile;
 - (vii) All roads and public easements within 1/4 mile of the pit site;
 - (viii) Proposed routes of access to public roads from the area to be excavated;

EXHIBIT 11

POLLUTION CONTROL AGENCY STANDARDS

MINNESOTA CODE OF AGENCY RULES
POLLUTION CONTROL AGENCY
EFFLUENT STANDARDS FOR
DISPOSAL SYSTEMS DISCHARGING
TO THE SOUTH FORK OF THE
ZUMBRO RIVER



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EXHIBIT 11 (Continued)

Pollution Control Agency

6 MCAR § 4.8040

TABLE III

Percolation Rate (Minutes per inch)	Required Soil Treatment Area in Square Feet (Per Gallon of Sewage Flow per Day)
Faster than 0.1**	-
0.1 to 5***	0.83
6 to 15	1.27
16 to 30	1.67
31 to 45	2.00
46 to 60	2.20
Slower than 60****	-

** Soil is unsuitable for standard system if percolation rate is less than 0.1 minutes per inch. See Appendix A, section C. 5.

*** Consider alternative sewage treatment systems for soils with this percolation rate range. See Appendix A, section C. 5.

**** Soil is unsuitable for standard system if percolation rate is slower than 60 minutes per inch. See Appendix A, section C. 4.

(5) Table III gives the required bottom area assuming six inches of filter material below the distribution pipe for trenches and beds. The required bottom area may be reduced, for trenches only, by the following percentages: 20 percent for 12 inches of filter material below the distribution pipe; 34 percent for 18 inches; and 40 percent for 24 inches. The filter material shall completely encase the distribution pipe to a depth of at least two inches.

b. Location.

(1) On slopes in excess of 12 percent, the soil profile shall be carefully evaluated in the location of the proposed soil treatment system and downslope to identify the presence of layers with different permeabilities that may cause sidehill seepage. In no case shall a trench be located within 15 feet of where such a layer surfaces on the downslope.

(2) Bed construction shall be limited to areas having natural slopes of less than six percent.

(3) Soil treatment systems shall be located as specified in Table IV following section H. 2. d. (3).

(4) Soil treatment areas shall not be placed in areas subject to flooding or in flood plains delineated by local ordinances adopted in compliance with the "State-wide Standards and Criteria for Management of Flood Plain Areas of Minnesota" (Minn. Reg. NR 85-93), or in areas for which regional flood information is available from the DNR, except that in areas where ten year flood information is available from and/or approved by the DNR, soil treatment systems may be installed in accordance with the provisions of Appendix A, section C. 6.

EXHIBIT 11 (Continued)

3. Bedrock proximity. In no case shall filter material of the soil treatment system be placed closer than three feet to creviced bedrock or to consolidated permeable bedrock. When all horizons of the original soil profile have percolation rates slower than 60 minutes per inch, filter material of the soil treatment system shall be placed no closer than seven feet to consolidated impermeable bedrock. A maximum depth of 24 inches of sand may be used under the filter material. Where additional fill is required to achieve the required separation distance, a soil having a percolation rate between five and 45 minutes per inch (loamy sand to silt loam) 12 months after placement shall be used. If it is not possible to allow the soil to settle for 12 months after placement, mechanical methods may be used to settle the fill to within ten percent of its "in situ" density.

4. Slowly permeable soils.

a. In no case shall excavation for the purpose of constructing a soil treatment system be made in any soil layer having a percolation rate slower than 120 minutes per inch.

b. In no case shall excavation for the purpose of constructing a soil treatment system be made in a soil layer having a percolation rate slower than 60 minutes per inch unless the moisture content is lower than the plastic limit of the soil.

c. In no case shall filter material be placed in contact with original soil having a percolation rate slower than 60 minutes per inch.

d. Where the percolation rate of the original soil is slower than 60 minutes per inch, at least six inches but no more than 12 inches of fill material having a percolation rate of between five and 30 minutes per inch (loamy sands and loams) after placement shall be placed between the filter material and the original soil along the excavation bottom and sidewalls.

e. In no case shall construction equipment, wheels or tracks be placed in contact with the bottom of the excavation during the construction of a soil treatment system in soils having a percolation rate slower than 15 minutes per inch.

f. The size of soil treatment system shall be based on the required treatment area for a soil having a percolation rate of 60 minutes per inch as specified in Table III set forth in section H. 2. a. (4).

5. Rapidly permeable soils.

a. Filter material for a soil treatment unit shall not be placed in contact with original soil having a percolation rate faster than one-tenth minute per inch.

b. For coarse soils having a percolation rate faster than one-tenth minute per inch, at least six inches of sandy loam textured soil having a per-

Exhibit 12. Although 40 percent less variances were requested in 1978 than in the previous year, only 76 percent of those requests were approved as compared to 96 percent of requests that were approved in 1977. In 1977, only 8 variances were denied, while in 1978, despite the reduction in variances granted from 164 to 93 in 1978, 28 were denied.

Federal, state and local legal and political constraints pose a significant burden and administrative cost on the development of land within the study area as can be seen above. Abatement of these restrictions in the near term is not foreseen. In fact, the revisions of WPC14 and 15 currently under preparation will place further stringent requirements on the development of shoreland within Minnesota and the study area.

EXHIBIT 12

VARIANCES GRANTED AND DENIED IN ST. LOUIS COUNTY

TOTAL VARIANCES GRANTED AS COMPARED TO THREE PREVIOUS YEARS

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
RANGE 12	15	13	16	2
RANGE 13	11	7	7	2
RANGE 14	11	7	6	4
RANGE 15	15	22	19	14
RANGE 16	30	34	29	17
RANGE 17	27	19	36	8
RANGE 18	16	17	15	10
RANGE 19	12	12	20	12
RANGE 20	7	2	13	8
RANGE 21	<u>20</u>	<u>29</u>	<u>35</u>	<u>16</u>
TOTAL	164	162	196	93

TOTAL VARIANCES DENIED AS COMPARED TO THREE PREVIOUS YEARS

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
RANGE 12	0	0	0	1
RANGE 13	0	2	0	5
RANGE 14	0	0	0	2
RANGE 15	1	1	1	2
RANGE 16	5	1	0	6
RANGE 17	3	3	0	3
RANGE 18	1	0	3	1
RANGE 19	1	2	0	3
RANGE 20	1	0	2	2
RANGE 21	<u>6</u>	<u>1</u>	<u>2</u>	<u>3</u>
TOTAL	18	10	8	28

Source: Planning & Zoning, St. Louis County Annual Report 1978

INDIRECT INDICATORS OF MARKET ACTIVITY

There are some secondary or indirect indicators of market activity that would be appropriate to mention here. They can be presented to help visualize demand for seasonal subdivision indirectly. The first, Exhibit 13, tabulates seasonal building permits issued within the study area of St. Louis County. The second is an examination of vehicle counts in the area furnished by the Minnesota Department of Transportation. The third is a study of floatplane flights from International Falls. Exhibit 14 is a graphic representation of the construction activity. As can be seen, the majority of building permits are centered around the major lakes of the southern portion of the study area, Burntside, Vermillion and Nett Lakes; in fact, these lakes account for approximately 75 percent of the permits issued within the ten year period studied. The remainder of the permits are on the southern shore of Kabetogama, Crane and Sand Point Lakes. Almost no activity of this type is shown for interior parcels or acreage in the remote reaches of the park area such as Rainy Lake.

Exhibit 15 is an abstract of average daily traffic volumes taken from the State Highway Traffic maps. It can be seen that although significant volumes of traffic are seen on Highway 53, or within the general area of International Falls, relatively little traffic volume was measured on the roads to interior parcels or to those lake parcels remote from Highway 53.

Exhibit 16 is a summary of floatplane flights departing from or chartered by Bohman Airways in International Falls for the nine-month period January through September of 1976 to the more remote reaches of Rainy and Namakan Lakes or the Kettle Falls Dam area, as well as to Crane Lake and Kabetogama Lake. Flights into the general area totaled 224 during the period, or an average of 25 a month. Further phone conversations with Dale Tomrdle, who conducted the survey, revealed that a large portion of the landings in the area were for the purpose of fishing, primarily in Canadian waters. He also stated that trips into international waters

BUILDING PERMITS ISSUED FOR SEASONAL RESIDENCES
IN ST. LOUIS COUNTY FOR 1970 - 1979

TNSP	Rg.	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	Total	% of Total	Location
62	12	2	2	0	2	4	3	8	3	3	2	29		One Pine Lake/White Iron Lake
	13	0	0	0	4	3	3	1	1	1	0	13		Twin Lakes
	14	0	1	0	6	4	3	2	0	3	4	23		Eagles Nest Lake
	15	6	8	0	10	9	5	6	9	5	21	79		S. Shore Vermillion Lake
	16	0	1	1	10	12	10	10	11	9	13	77		S. Shore Vermillion Lake
	17	3	5	0	4	5	7	0	4	6	4	38		S. Shore Vermillion Lake
	18	0	0	0	0	0	0	0	0	0	0	0		
	19	0	0	0	0	0	1	1	0	2	1	5		
	20	0	0	0	1	1	0	0	0	0	1	3		
	21	0	0	0	1	2	1	4	0	0	2	10		
Subtotal												277	44%	Sturgeon River
63	12	2	2	0	1	5	8	2	6	9	2	37		Shagawa Lake (Ely)
	13	1	0	0	4	3	4	2	3	1	3	21		Burntside Lake
	14	0	0	0	1	1	0	1	0	0	1	4		
	15	0	0	0	1	2	0	1	3	3	5	15		Trout and Pine Lakes
	16	6	5	0	2	1	10	3	2	3	1	33		N. Vermillion Bay and Trout Lake
	17	3	8	0	1	7	10	9	0	0	0	38		Niles Bay and Vermillion Lake
	18	5	5	0	0	8	1	2	2	0	1	24		N.W. Vermillion Lake
	19	1	0	0	2	1	0	1	2	0	0	7		
	20	0	0	0	2	1	0	0	1	1	0	5		
	21	0	0	0	1	0	2	1	0	0	0	4		
Subtotal												188	30%	
64	12	0	0	0	1	0	0	0	0	2	2	5		
	13	2	1	0	1	3	2	0	2	0	0	11		
	14	0	0	0	0	0	0	0	0	0	0	0		
	15	0	0	0	0	0	0	0	0	0	0	0		
	16	0	0	0	0	0	0	0	0	0	0	0		
	17	0	0	0	0	0	0	0	1	1	1	3		
	18	0	8	0	4	3	0	2	0	4	4	25		Elbow Lake
	19	0	0	0	0	0	0	0	0	1	1	2		
	20	2	1	0	2	1	1	3	1	0	3	14		S. Shore Pelican Lake
	21	0	0	0	0	0	0	0	1	0	0	1		
Subtotal												61	10%	

EXHIBIT 13

BUILDING PERMITS ISSUED FOR SEASONAL RESIDENCES
IN ST. LOUIS COUNTY FOR 1970 - 1979

TNSP	Rg.	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	Total	% of Total	Location
65	12	0	0	0	0	0	0	0	0	0	0	0		
	13	0	0	0	0	0	0	0	0	0	0	0		
	14	0	0	0	0	0	0	0	0	0	0	0		
	15	0	0	0	0	0	0	0	0	0	0	0		
	16	0	0	0	0	0	0	0	0	1	0	1		
	17	0	0	0	1	1	4	1	3	0	0	1		
	18	0	1	0	1	0	0	2	0	4	2	10		Vermillion River
	19	0	0	0	0	0	0	0	0	0	0	10		Myrtle & Kjostad Lake
	20	0	1	0	0	1	2	3	1	0	1	0		
	21	0	0	0	0	0	0	0	0	0	0	9		N. Shore Pelican
Subtotal												31	5%	
66	12	0	0	0	0	0	0	0	0	0	0	0		
	13	0	0	0	0	0	0	0	0	0	0	0		
	14	0	0	0	0	0	0	0	0	0	0	0		
	15	0	0	0	0	0	0	0	0	0	0	0		
	16	0	0	0	1	0	0	0	0	0	0	1		
	17	0	0	0	0	1	0	0	0	0	1	2		
	18	0	0	0	1	0	0	0	0	0	0	1		
	19	2	3	0	2	0	1	1	1	1	1	12		Black Duck Lake & Elephant Lake
	20	0	3	0	0	0	0	0	1	0	0	4		
	21	0	0	0	1	0	0	0	0	0	0	1		
Subtotal												21	3%	
67	12	0	0	0	0	0	0	0	0	0	0	0		
	13	0	0	0	0	0	0	0	0	0	0	0		
	14	0	0	0	0	0	0	0	0	0	0	0		
	15	0	0	0	0	0	0	0	0	0	0	0		
	16	0	0	0	0	0	0	0	0	0	0	0		
	17	1	7	0	1	1	0	2	1	5	3	19		Crane Lake
	18	0	0	0	0	0	0	1	0	0	0	1		
	19	1	0	0	0	0	0	1	0	0	1	3		
	20	0	0	0	0	0	0	0	0	0	0	0		
	21	0	0	0	0	0	0	0	0	0	0	0		
Subtotal												23	4%	

EXHIBIT 13 (Continued)

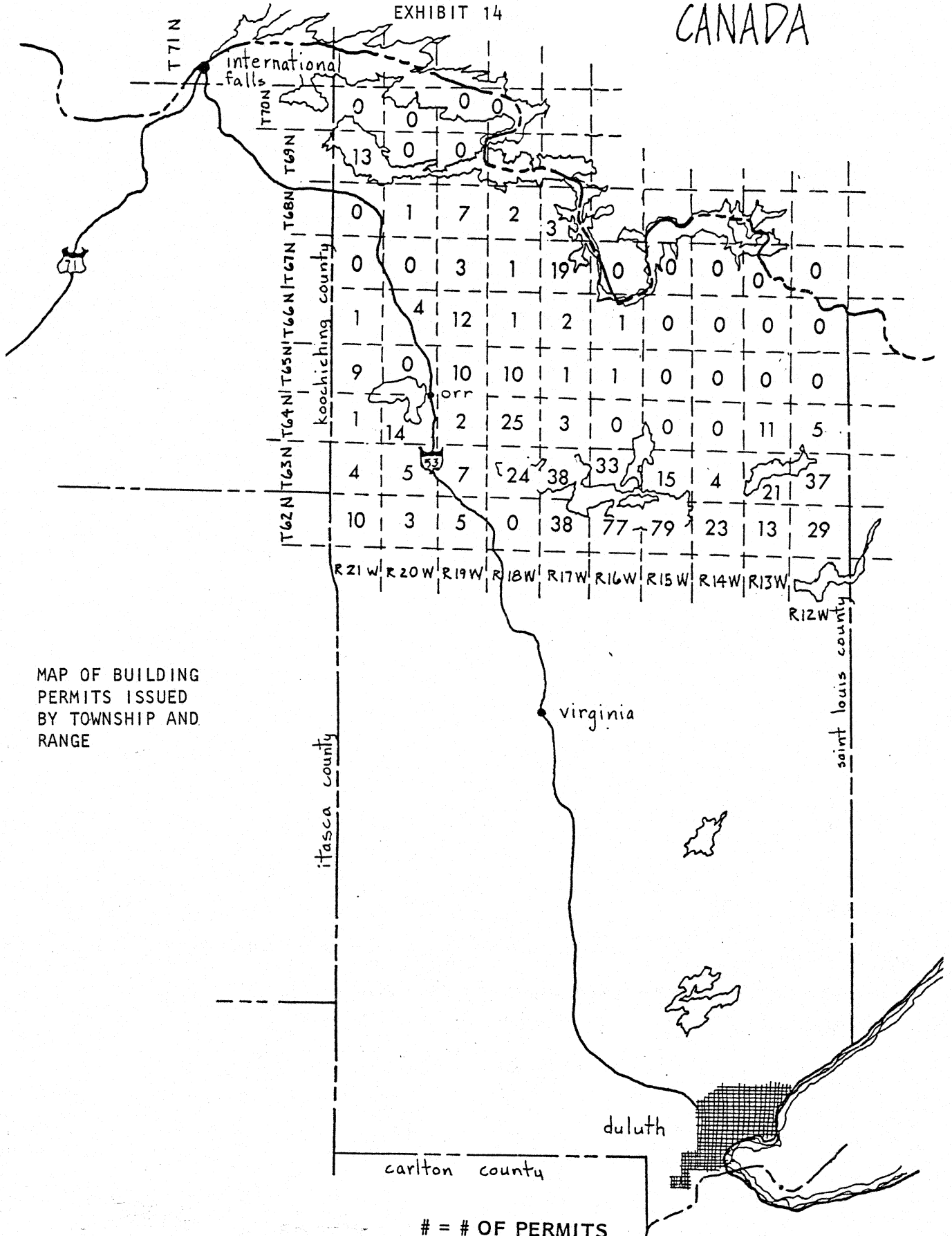
BUILDING PERMITS ISSUED FOR SEASONAL RESIDENCES
IN ST. LOUIS COUNTY FOR 1970 - 1979

TNSP	Rg.	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	Total	% of Total	Location
68	12	0	0	0	0	0	0	0	0	0	0	0		
	13	0	0	0	0	0	0	0	0	0	0	0		
	14	0	0	0	0	0	0	0	0	0	0	0		
	15	0	0	0	0	0	0	0	0	0	0	0		
	16	0	0	0	0	0	0	0	0	0	0	0		
	17	0	0	0	0	1	0	0	0	2	0	3		
	18	0	0	0	0	0	1	0	1	0	0	2		
	19	0	0	0	1	1	2	0	1	1	1	7		
	20	0	0	0	0	0	0	0	0	0	1	1		
	21	0	0	0	0	0	0	0	0	0	0	0		
Subtotal												13	2%	
69	12	0	0	0	0	0	0	0	0	0	0	0		
	13	0	0	0	0	0	0	0	0	0	0	0		
	14	0	0	0	0	0	0	0	0	0	0	0		
	15	0	0	0	0	0	0	0	0	0	0	0		
	16	0	0	0	0	0	0	0	0	0	0	0		
	17	0	0	0	0	0	0	0	0	0	0	0		
	18	0	0	0	0	0	0	0	0	0	0	0		
	19	0	0	0	0	0	0	0	0	0	0	0		
	20	0	0	0	0	0	0	0	0	0	0	0		
	21	0	0	0	7	1	1	0	0	0	4	13		
Subtotal												13	2%	So. Shore Kabetogama Lake
70	12	0	0	0	0	0	0	0	0	0	0	0		
	13	0	0	0	0	0	0	0	0	0	0	0		
	14	0	0	0	0	0	0	0	0	0	0	0		
	15	0	0	0	0	0	0	0	0	0	0	0		
	16	0	0	0	0	0	0	0	0	0	0	0		
	17	0	0	0	0	0	0	0	0	0	0	0		
	18	0	0	0	0	0	0	0	0	0	0	0		
	19	0	0	0	0	0	0	0	0	0	0	0		
	20	0	0	0	0	0	0	0	0	0	0	0		
	21	0	0	0	0	0	0	0	0	0	0	0		
Subtotal												0		
TOTAL		37	62	1	77	83	83	70	58	68	87	626		

EXHIBIT 13 (Continued)

EXHIBIT 14

CANADA



MAP OF BUILDING PERMITS ISSUED BY TOWNSHIP AND RANGE

= # OF PERMITS IN TOWNSHIP

CANADA



EXHIBIT 16

SUMMARY OF SEAPLANE AND FLOATPLANE FLIGHTS, BOHMAN AIRWAYS, INTERNATIONAL FALLS, MINNESOTA, VOYAGEURS NATIONAL PARK, JANUARY - SEPTEMBER, 1976

Compiled by Dale Tomrdle, National Park Service, Denver, Colorado

<u>Period</u>	<u>Destination</u>	<u>No. of Flights</u>
Jan.-Mar.	Rainy Lake/Islands	4
	Kettle Falls Dam	1
Apr.-May	Kettle Falls Dam	7
	Rainy Lake/Islands	10
	Crane Lake	2
	Kabetogama & Peninsula Lakes	6
June	Kettle Falls Dam	15
	Rainy Lake/Islands	11
	Kabetogama & Peninsula Lakes	31
July	Kettle Falls Dam	9
	Rainy Lake/Islands	15
	Kabetogama & Peninsula Lakes	29
August	Rainy Lake/Islands	11
	Kabetogama & Peninsula Lakes	31
September	Kettle Falls Dam	7
	Rainy Lake/Islands	5
	Kabetogama & Peninsula Lakes	<u>30</u>
Total January - September		224

NOTES:

Rainy Lake/Islands - Landings in Rainy Lake or Namakan Lake or islands, which are transected by international boundary.

Crane Lake - is a U.S. customs location outside the boundaries of the park.

Kettle Falls Dam - is site of International Joint Commission water control structure on international boundary, also location of small resort. Totals for recreational versus non-recreational landings are not available.

Kabetogama & Peninsula Lakes - Landings on lakes not transected by international boundary.

were 43 percent of the total flights. The remainder of the trips consisted of fishing expeditions into non-international lake areas and transporting of private land owners or guests and visitors to cabins.

A comparison of relative traffic volumes by land and air and building activity within the study area indicate that remote non-shoreland or remote stretches of Rainy Lake have markedly lower visitations than shoreland proximate to major highways.

ANALYSIS OF MARKET TRANSACTIONS IN THE STUDY AREA

The principal thrust of this assignment is to estimate an absorption rate. An absorption rate describes the ratio of effective demand to supply. In its simplest terms, the demand is reflected by lots or parcels sold and the supply is evidenced by the total lots or parcels available for sale. The absorption rate for the subject area was studied from two perspectives, the first measured the rate of sale of seasonal subdivision lots as compared to the available supply of these lots, and the second measured sales of small and large acreage parcels to the total supply of privately owned property. We also have compared and contrasted these categories for those parcels possessing water or lakeshore frontage and those not possessing these attributes as well as other categories or characteristics such as road access versus non-road access. Firstly, to estimate the absorption of seasonal residential subdivisions, an analysis of the inventory of seasonal subdivisions within the study area was made. A seasonal subdivision is defined by the St. Louis County Zoning Ordinance (Exhibit 10) as a home, cabin, or other facility which is used for not more than eight months a year and does not require public services such as trash pickup, snow plowing, road repair, and the like.

Exhibit 17 is a summary description of all lakeshore subdivisions platted in St. Louis and Koochiching Counties from 1969 to the present. It lists 31 subdivisions. These were obtained from the records of the County Zoning Administrators for each county. Exhibit 18 reflects the absorption of seasonal residential subdivisions within the study area and is a listing of all seasonal subdivisions and their lot sales from 1969 to the present. These 12 subdivisions were categorized as either predominantly seasonal or hybrid seasonal. The term seasonal was defined previously and is used to contrast these subdivisions with permanent or year-round residency by the owners. The location of the subdivision, the type of improvements generally constructed within the subdivision, and the

LAKESHORE SUBDIVISIONS PLATTED IN ST. LOUIS AND KOOCHICHING COUNTIES
FROM 1969 TO PRESENT¹

	<u>Subdivision Name</u>	<u>Location</u>	<u>Legal Description TN-RG-SEC</u>	<u>Date Plat Filed</u>
St. Louis County				
1	Ring Rock	White Iron Lake	62-12-12	10/77
2	One Pine Estates	One Pine Lake	62-12-28,33	1/73
3	Chippewa Shores	White Iron Lake	62-12-12	5/76
4	Bulinski's Point	Shagawa Lake	63-12-29	9/77
5	Everett Lake	Everett Lake	64-12-16	6/78
6	Bevis Kenney Burntside Lots	Burntside Lake	63-13-24	5/75
7	Wildgate	Armstrong Lake	62-14-13	3/78
8	Three Deer Haven	Clear Lake	62-14-13	2/70
9	Aga Ming	Vermillion Lake	62-15-30	1/70
10	Pine Narrows	Pine Island (N. Vermillion)	63-15-33	11/69
11	Onamen Beach	Vermillion Lake	62-16-7	Late 79
12	Daisy Green Acres	Vermillion Lake	62-16-9	6/78
13	Squires Roost	Vermillion Lake	62-16-23	12/68
14	Tibbets Addn. to Wolf Bay Shores	Vermillion Lake	63-17-12	12/77
15	Robergs Acres	Wolf Bay/Vermillion Lake	63-17-11	6/77
16	Lu Claire Narrows	Lake Vermillion	63-17-35	1/76
17	Seimi Shores	Niles Bay/Vermillion Lake	63-17-21	2/71
18	Wolf Bay Shores*	Vermillion Lake	63-17-11,12	4/71
19	Handberg's Addition	Crane Lake	67-17-5	12/75
20	Ev Lor Island*	Sandpoint Lake	68-17-14	4/71
21	Mitawanga	Sandpoint Lake	68-17-1	7/67
22	Mannikko (Pine Ridge)	Black Bay/Vermillion Lake	63-18-10	8/73
23	Kennedy Home Sites	Elbow Lake	64-18-27	Unknown
24	Pelican Lots	Pelican Lake	64-20-7	12/71
25	Krambeck's Ash Lake Addition	Ash Lake	66-20-9	12/69
26	Diamond Island*	Rainy Lake	71-21-22	9/70
27	Chig-A-Big	Shagawa Lake	63-12-21	4/78
<u>Proposed</u>				
28 & 29	Ely Island* (2 Proposed)	Vermillion Lake	62-15-16	
30	Northern Lights	Kabetogama	69-21	
Koochiching County				
31	Gold Shores Second Addition	Rainy Lake	71-22-31	3/76

Number of Subdivisions (Platted and Proposed) above 63 TNSP = 9 30%
Number of Subdivisions (Platted and Proposed) on Vermillion Lake = 13 43%

*Water Access Only

¹No division between Permanent and Seasonal Developments

LOT SALES OF SEASONAL RESIDENTIAL SUBDIVISIONS IN
IN ST. LOUIS COUNTY FROM 1969 TO PRESENT

Subdivision Name	Location (TN-RG-SEC)	Date Plat Filed	Total No. of Lots	Total Acreage	Average Lot Size	Absorption Rate		No. of Lots Unsold to Date	Percent of Total	Average Sold Per Year (Rate)
						First Sale	Last Sale			
Predominately Seasonal										
1. Tibbetts Addition to Wolf Bay Shores	Wolf Bay (Vermillion) (63-17-12)	12/77	12	29.2	2.39	2/27/79	1 sale	11	92%	.4
2. Roberg's Acres	Dago Bay (Vermillion) (63-17-11)	6/77	5	20.2	4.04	6/30/78	1 sale	4	80%	.33
3. Seime Shores (Water Access Only)	Niles Bay (Vermillion) (63-17-21)	2/71	18	15.8	.88	8/5/71	3/19/75	2	11%	3.84*
4. Ev Lor Island (Water Access Only)	Sand Point Lake (68-17-14)	4/71	26	48.1	1.85	6/8/77	Sold all to USA	Sold None from 4/71 to 6/77		
5. Mannikko (Pine Ridge)	N.W. Vermillion (63-18-10)	8/73	9	10.1	.90	1/20/73	9/26/79	2	22%	.97
6. Diamond Island	Rainy Lake (71-21-32)	9/70	10	10.7	1.07	2/5/71	4/3/77	3	30%	.76
Total Average Rate of Lots Sold a Year										.82
Hybrid Seasonal										
7. Everett Lake Shores	Everett Lake (64-12-31)	6/78	19	90.9	4.79	12/8/78	3/19/79	17	89%	1.0
8. Handberg's Addition	Crane Lake (67-17-25)	12/75	9**	26.8	2.22	3/3/76	5/23/78	3**	33%	1.71
9. Onamen Beach	S. Shore Vermillion (62-16-21)	12/79	5	25.8	5.16	1/11/80	4 Sold Same date	1	20%	8.0
10. Chig-A-Big, First Addition	Shagawa Lake (63-12-21)	4/17/78	7	46.0	6.57	6/79	1/80	4	57%	1.38
11. Daisy Green	Vermillion Lake (62-16-9)	6/12/78	15	41.0	2.73	8/78	1 sale	14	93%	.50
12. Bulinski's Point	Shagawa Lake (63-12-29)	7/8/77	19	20.0	1.02	9/77	4/80	12	63%	2.40
Total Average Rate of Lots Sold a Year										1.68

Total Average calculated by mean of Rate of Sales.

*Assumes marketing effort terminated on date of last sale

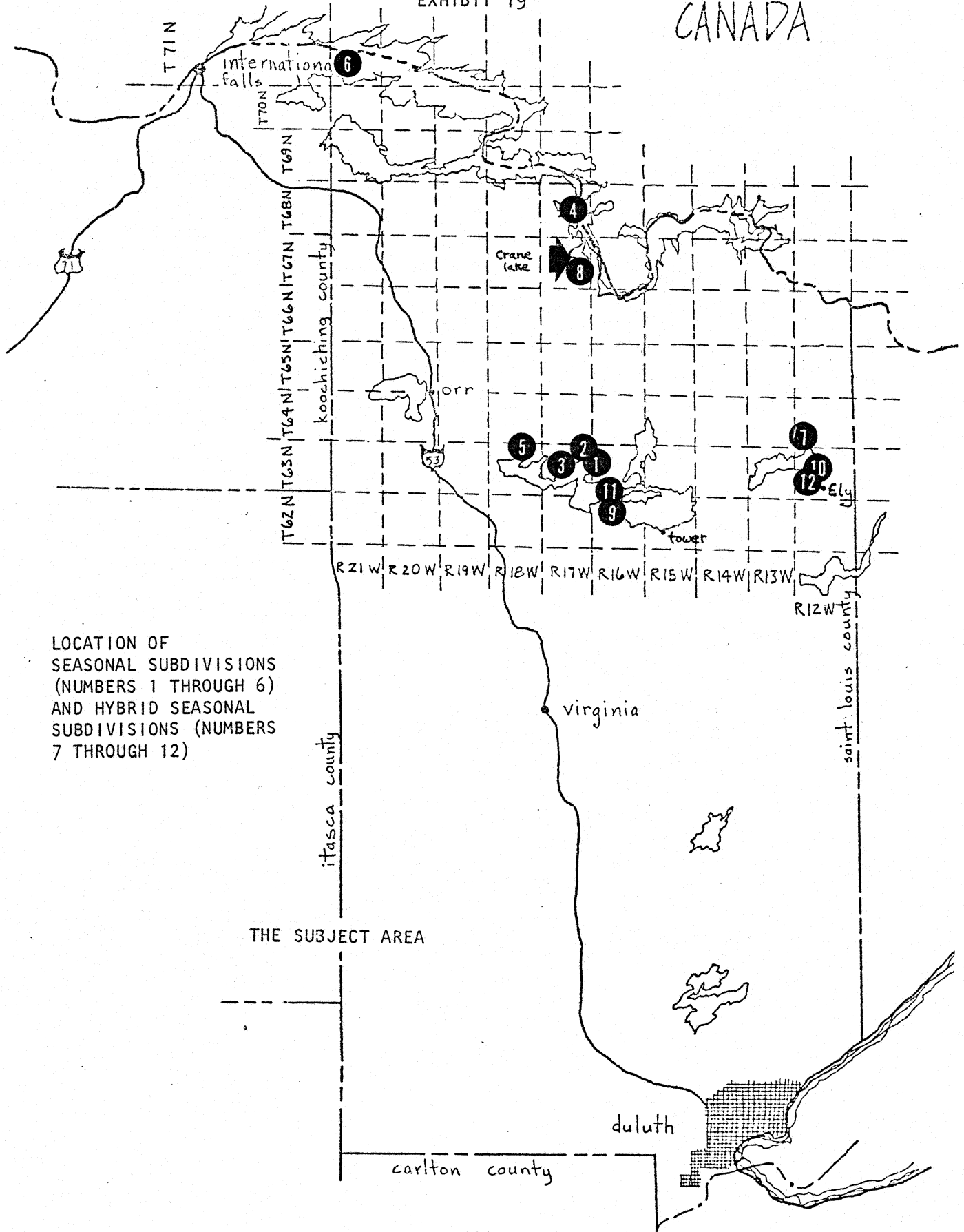
mailing addresses to which tax notices were sent if different from the address of the subdivision were used to further refine the concept of the "seasonality" of a subdivision. The term "hybrid seasonal" refers to seasonal subdivisions that are proximate to towns or municipalities or that have ready access to them by major highways. It can be seen from the fourth column in Exhibit 18 that 154 seasonal lots were created during the 11½ year period survey. As of mid-year 1980, the columns entitled "Number of Lots Unsold to Date" and "Percentage of Total" represent specific sellouts. None of the 12 subdivisions have completely sold out. The average rate of lot sales for the seasonal subdivisions was less than one lot per year or .82 a year. The average lot sales for hybrid seasonal subdivisions, those most convenient to towns, was double this rate or 1.68 lots per year.

Exhibit 19 reflects the location of these subdivisions. Nine of the subdivisions are located in the southern portion of the study area with only three in the northern part. Two of the subdivisions, Seime Shores and Ev Lor Island, are water access only.

From our sales analysis, another issue can be addressed, that of the sales price of raw land purchased for subdivision purposes. Five sales of land that was ultimately developed as a seasonal subdivision were ascertained. All twelve of the subdivisions previously described were researched but no transfers were found other than these five for the period 1969 to the present. This is not uncommon as in similar areas it has been our experience that the land that is developed has been held for some time by the developer or relatives or is contributed by one partner to a partnership established for the purpose of developing a tract of land, and therefore, no actual arms length transfer of property is evidenced. Of the five sales shown in Exhibit 20, Sale 5 was a conveyance by probate deed and therefore was not considered an arms length transaction and relevant. Sales 1 through 4 reflect relatively current sales of property for subdivision purposes. The price

EXHIBIT 19

CANADA



LOCATION OF
SEASONAL SUBDIVISIONS
(NUMBERS 1 THROUGH 6)
AND HYBRID SEASONAL
SUBDIVISIONS (NUMBERS
7 THROUGH 12)

THE SUBJECT AREA

LAND PURCHASES FOR THE PURPOSE OF SUBDIVISION DEVELOPMENT

<u>Subdivision Name</u>	<u>Legal Description</u>	<u>Grantor</u>	<u>Grantee</u>	<u>Type of Deed</u>	<u>Date of Instrument</u>	<u>Tax</u>	<u>Date Platted</u>	<u>Acreage</u>	<u>Purchase Price</u>	<u>Price Per Acre</u>
⑪ Everett Lake Shores	(TN-RG-SEC) 64-12-31 lots 2, 6, 7, 10 & SE/SE	Gothard	Bulinski	Warranty	8/24/77	\$100.10	8/7/78	202.3	\$ 4,500	\$ 22.50
⑫ Onamen Beach	62-16-21 lot 1, & SE/NE & NE/SE, 62-16-22 lot 25, Bay View	Not Available	Wydella	Warranty	9/15/79	\$352.00	12/15/79	106.3	\$16,000	\$151.00
⑬ Daisy Green Acres	62-16-9 lots 3 & 4	Mustful	Vermillion Properties	Warranty	10/18/77	\$616.00	6/12/78	41.0	\$28,000	\$683.00
⑭ Bulinski's Point	63-12-29 lots 1 & 3; lot 3 Shagawa Plat	Gianotti	Bulinski	Warranty	1/25/77	\$220.00	7/8/77	23.52	\$10,000	\$425.00
⑮ Chig-A-Big First Addition	63-12-21 lots 1 & 6	Hegfors	Hegfors	Probate	7/19/73	None	4/17/78	46.0	N/A	N/A

EXHIBIT 20

per acre is well correlated with the size of the parcel. Sales 1 and 2 are largest in size but sold for the least price per acre, that is, \$22.50 an acre and \$151 an acre. Sales 3 and 4, the smallest in size, sold for \$683 and \$425 per acre respectively. All four sales were previously categorized as hybrid seasonal in terms of classification of the finished subdivision. Exhibit 21 displays the relative location of these parcels.

Of interest then would be an analysis of the subdivision and the lots within them over the last ten years. Exhibit 22 is a summary of the lot inventory and sales within seasonal subdivisions in the study area for all twelve of the previously identified subdivisions. In these 12 subdivisions a total of 154 lots have been created since 1969. Only 55 of those lots have sold to private parties to date. Seventy-three lots still remain available. It can be seen that the creation of new lots has exceeded demand. For the ten year period from January of 1973 to June of 1980, an average of 5.2 lots were sold in a typical year. The 73 lots which remain available at this point would require 14 years to market at this rate, if no new subdivisions were created in the area to join the existing inventory.

The previous analysis of subdivision lots referred only to a certain tier of the market, that of platted subdivisions. There is another tier of the market for land within the study area, namely, for unplatted acreage. In order to measure the rate or ratio of the absorption as reflected by actual transactions or sales of properties as compared to the total available inventory or supply, research and analysis was conducted to obtain the sales completed within the last ten years and compare it to a measure of the available supply of land within the study area. These sales are categorized by land type in Exhibit 23. Record classification in the courthouses for the study area precluded our investigation prior to 1972, thus invoking a rather arbitrary limitation, but this is certainly a broad enough time window with which to make reasonable statements about the near

EXHIBIT 21

CANADA

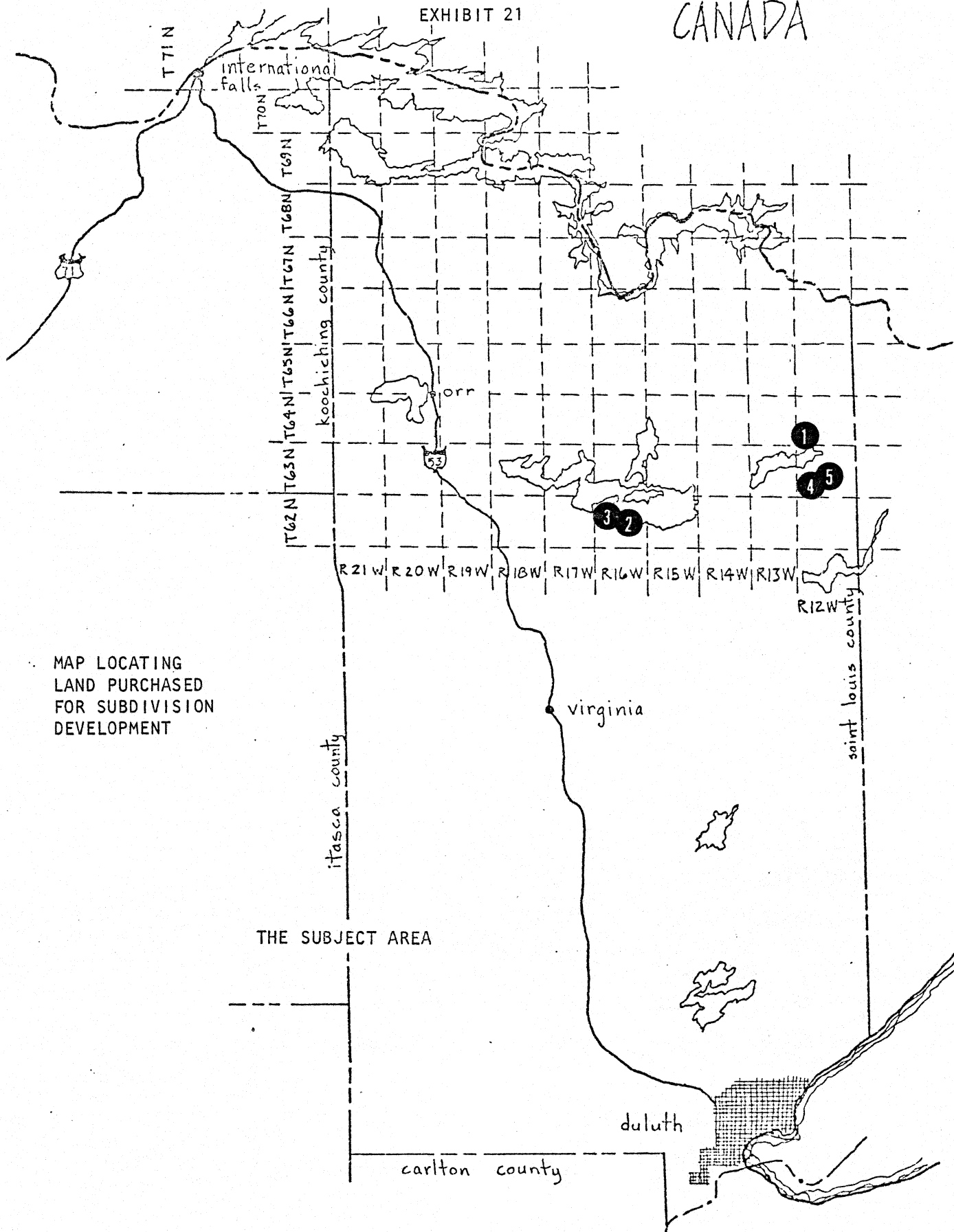


EXHIBIT 22

LOT INVENTORY AND SALES IN SEASONAL SUBDIVISIONS WITHIN THE STUDY AREA (Seasonal Subdivisions Identified in Exhibit 5)¹

<u>Date</u>	<u>Old Lots Available</u>	<u>New Lots Available</u>	<u>Total</u>	<u>Lots Sold During Year</u> ¹	<u>Lots Available Year End</u>
1970	0	10 (Diamond Island)	10	0	10
1971	10	18 (Seime Shores) 26 (Ev Lor Island)	54	5	49
1972	49	0	49	3	46
1973	46	9 (Mannikko)	55	8	47
1974	47	0	47	4	43
1975	43	9 ² (Handberg's Addition)	52	4	48
1976	48	0	48	4	44
1977	44	12 (Tibbett's Addition) 5 (Roberg's Addition) 19 (Bulinski's Point)	80	5 ³	49
1978	49	19 (Everett Lake Shore) 7 (Chig-A-Big) 15 (Daisy Green)	90	9	81
1979	81	5 (Onamen Beach)	86	10	76
1980 (Thru June)	76	0	76	3	73
		154		55 ²	73
	Total Lots Available over 10½ years or 14.7 lots available in typical year		Total lots sold over 10½ years or 5.2 lots sold in typical year		Total inven- tory of lots still avail- able in these subdivisions

¹Only transfers of ownership with developer as grantor are included

²Includes 1 out lot, and 3 lots not on the lake

³Excludes 26 lots in Ev Lor Island all sold to U.S.A.

EXHIBIT 23

CATEGORIZATIONS BY LAND TYPES FOR LAND SALES RESEARCHED AND COMPARISON BY CATEGORY

	<u>Average Price Per WFF</u>	<u>Number of Sales</u>	<u>Average Price Per Acre</u>	<u>Number of Sales</u>
<u>Islands (Lots)</u>				
Koochiching County	\$16.76	25	\$ 3,816	25
St. Louis County	53.58	20	12,112	20
Total Average	<u>33.12</u>	<u>45</u>	<u>7,503</u>	<u>45</u>
<u>Islands (Acreages)</u>				
Koochiching County	\$ 8.00	2	\$ 3,234	2
St. Louis County	9.87	3	5,073	3
Total Average	<u>9.12</u>	<u>5</u>	<u>4,337</u>	<u>5</u>
<u>Lakeshore (Lots)</u>				
Koochiching County	\$93.28	64	\$13,967	64
St. Louis County	48.06	70	6,664	73
Total Average	<u>69.66</u>	<u>134</u>	<u>10,076</u>	<u>137</u>
<u>Lakeshore (Acreages)</u>				
Koochiching County	\$ 6.20	3	\$ 327	3
St. Louis County	26.05	77	2,034	79
Total Average	<u>25.31</u>	<u>80</u>	<u>1,972</u>	<u>82</u>
<u>Non-Lakeshore (Lots)</u>				
Koochiching County	--	--	\$ 3,041	34
St. Louis County	--	--	Not Calculated	--
Total Average	--	--	3,041	34
<u>Non-Lakeshore (Acreages)</u>				
Koochiching County	--	--	\$ 361	14
St. Louis County	--	--	474	225
Total Average	--	--	<u>467</u>	<u>239</u>

Note: The above figures are calculations on sales gathered by Landmark Research, Inc., and do not include the sales previously obtained from the National Park Service.

Ratios

Island subdivisions lots per front foot/to non-island lakeshore subdivision lots per front foot	= .475
WFF lots per acre/to non-WFF lots per acre	= 3.313
WFF acreage per acre/to non-WFF acreage per acre	= 4.223
Island acreage per acre/to non-island lakeshore acreage per acre	= 2.199
Island lots per acre/to non-island WFF lots per acre	= .745
Sales price per acre of lakeshore subdivision lots/to sales price per acre of lakeshore acreage	= 5.110

term possibilities and probabilities relating to effective demand as compared to the available supply within the study area. Exhibit 24 is a computation of this effective demand to supply or the absorption rate of lakeshore land from 1972 to 1980 within the study area. It shows the rate of absorption of unimproved, unincorporated, private lakeshore for both platted and unplatted lands.

The basis for the quantification of the total supply is a computer tabulation from the Minnesota Land Information System (MLIS) which has categorized all of Minnesota land on the basis of the 40-acre cell sizes, the smallest denominator under the grid surveying system. Exhibit 24 shows, firstly, the total number of 40-acre cells within the study area, that is 51,045, or 2,041,800 total acres. Secondly, it shows the number of these 40-acre cells that are lakeshore, or a total of 9,728, or 389,120 acres; and thirdly, the number of lakeshore cells privately owned, a total of 3,677, or 147,080 acres.

From all these figures a number of conclusions can be drawn. Of the 2,041,800 acres within the study area, only seven percent, or 147,080 acres are lakeshore properties that are in private ownership. Also, the absorption rate calculation shows that during the eight and a half year period for which the data was analyzed, only 1.35 percent of this privately owned shoreland actually sold. On the average for a year, only .16 of one percent of land sold. Despite the near monopoly position of a private land owner with lakeshore property, if he chose to sell an acre in a given year, he would have on the average only .16 of one percent chances per year or 16 chances in 10,000 to sell that one acre of land in that year. From this data and analysis it can be clearly stated that the supply is large, but the demand is relatively low.

Along these lines, it should also be noted that there are over a million acres, which is approximately 25 percent of all the lands in St. Louis county, that are tax forfeited and available for sale from the County Auditor's Department. In fact, an article in the Government Lands Digest reference to Exhibit 26 states,

COMPUTATION OF THE ABSORPTION
RATE OF LAKESHORE LAND
1972 TO 1980 IN THE STUDY AREA

Total Number of 40 Acres "Cells" (MLMIS) in Study Area

		<u>Total Acres</u>
Koochiching County	9,893	395,720
St. Louis County	<u>41,152</u>	<u>1,646,080</u>
Combined Total	51,045	2,041,800

Total Number of 40 Acre Lakeshore "Cells" (MLMIS)

	<u>Lakeshore</u>	<u>Islands</u>	<u>Total</u>
Koochiching County	459	169	628
St. Louis County	<u>7,542</u>	<u>1,558</u>	<u>9,100</u>
Combined Total	8,001	1,727	9,728

In Acres

<u>Lakeshore</u>	<u>Islands</u>	<u>Total</u>
18,360	6,760	25,120
<u>301,680</u>	<u>62,320</u>	<u>364,000</u>
320,040	69,080	389,120

Percentage
of Land is
Lakeshore

6.4
22.1
19.1

Number of Lakeshore "Cells" in Private Ownership

	<u>Lakeshore</u>	<u>Islands</u>	<u>Total</u>
Koochiching County	191	127	318
St. Louis County	<u>2,409</u>	<u>950</u>	<u>3,359</u>
Combined Total	2,600	1,077	3,677

In Acres

<u>Lakeshore</u>	<u>Islands</u>	<u>Total</u>
7,640	5,080	12,720
<u>96,360</u>	<u>38,000</u>	<u>134,360</u>
104,000	43,080	147,080**

Absorption Rate(s) -- Total Number of Unimproved, Unincorporated, Private Lakeshore Acres Sold
During 1972 to 1980 by Category

	<u>Lakeshore</u>	<u>Percent of Private Land Sold</u>	<u>Islands</u>	<u>Percent of Private Land Sold</u>	<u>Total</u>	<u>Percent of Total Private Land Sold</u>
Koochiching County	195	2.6	78	1.5	273	2.15
St. Louis County	<u>1,666</u>	<u>1.7</u>	<u>47</u>	<u>0.12</u>	<u>1,713</u>	<u>1.28</u>
Combined Total	1,861	1.8	125	0.29	1,986*	1.35

FOR THE 8½ YEAR PERIOD 1.35 PERCENT (1,986 ACRES*/147,080 ACRES**) OF PRIVATELY OWNED SHORELAND WAS SOLD.
ON THE AVERAGE, 1 AND 6/10THS OF A PERCENT (.0135/8.5 YEARS = .0016) WAS SOLD A YEAR.

Source: Minnesota Land Management Information System (MLMIS) for land categorization
Landmark Research, Inc., for sales research

EXHIBIT 25

MINNESOTA LAND MANAGEMENT INFORMATION SYSTEM REPORT
AND CORRESPONDENCE ON SHORELAND INVENTORY



Minnesota State Planning Agency

Land Management Information Center
Room LL45 Metro Square Building
7th & Robert Streets
St. Paul, Minnesota 55101
Phone (612) 296-1211

9.3.80

LANDMARK RESEARCH, INC.
1501 MONROE ST.
MADISON, WI. 53711

Dear Ms. Schell:

Here are your parcel counts for privately owned lake shoreland. We also included island shoreland in the raw count. Adding together the counts for the 3 counties in your study area will give you a final count for your study area as follows:

② LAKE SHORELAND IN PRIVATE OWNERSHIP	NUMBER OF CELLS
Itasca Cy.	29
Kooch. Cy.	191
St. Louis Cy.	<u>2409</u>
total:	2629 cells

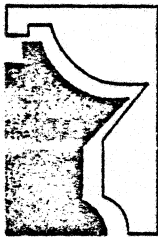
Note that the above total does not include island shoreland. You may decide to add that in. For your information we also counted the number of 40-acre parcels that are shoreland and publicly owned.

Let me know if you have additional questions.

AN EQUAL OPPORTUNITY EMPLOYER



Sincerely,
Laura Freundlich



Minnesota State Planning Agency

Land Management Information Center
Room LL45 Metro Square Building
7th & Robert Streets
St. Paul, Minnesota 55101
Phone (612) 296-1211

8.20.80

Dear Ms. Schell,

Enclosed are the counts you requested. Note that these were done by county, and then totaled on the enclosed white sheet. You may also be interested in island parcels - The number of these are noted on the enclosed printout.

If you need additional assistance, don't hesitate to contact us.

Sincerely,
Laura Freundlich

8.20.80

WITHIN TOWNSHIP 62N TO 71N AND RANGE 12W TO 23W:

③ ① NUMBER OF 40-ACRE LAKESHORE PARCELS:

ITASCA CY: 74

KOOCH. CY: 459

ST. LOUIS CY: 7542

8075 LAKESHORE PARCELS

① ② TOTAL NUMBER OF 40-ACRE PARCELS:

ITASCA CY: 1175

KOOCH. CY: 9893

ST. LOUIS CY: 41152

52220 PARCELS

OK, SEG ITASCOUNTS*

PAGE 0001

OK, SEG ITASCOUNTS*

1

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EEEE PPPP PPPP L 66666
EE P P P P L 6
EE P P P P L 6
EEE PPPP PPPP L 66666
E P P P L 6 6
E P P L 6 6
EEEE P P LLLL 66666

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STARTLOO

OLD = EPP.ITASHORN1.WINDO
OLD = EPP.ITASOWNS1.WINDO

FREQUENC

IN = OLD1
MIN = 1
MAX = 2
IN = OLD2
MIN = 0
MAX = 71
LEG = LEG.ITASHORN
LEG = LEG.ITASOWNS

STOPLOOP

NEW = EPP.ITASFREQS02
NAM = *

FREQUENCY COUNT OF VARIABLE OLD2
FREQUENCY COUNT OF PRIVATE LAND OWNERSHIP FOR AREA WITHIN T62N AND
R22W-23W (ITASCA COUNTY)

FREQUENCY COUNT OF SUB VARIABLE OLD1
FREQUENCY COUNT OF WATER ORIENTATION FOR AREA WITHIN T62N AND R22-23W
(ITASCA COUNTY)

VARIABLE : SUB VARIABLE : : V V		SYMBOL	COUNT	PERCENT	DESCRIPTION
CLASS	0	0000	30	40.00	PRIVATE OWNERSHIP
	1	0000	1	3.33	ISLAND SHORELAND
	2	0000	27	76.67	LAKE SHORELAND
20		TTTT	11	14.67	D.N.R. FORESTRY LANDS WITHIN STATE FOREST
	2	TTTT	11	100.00	LAKE SHORELAND
70		++++	34	45.33	COUNTY FORESTS
	2	++++	34	100.00	LAKE SHORELAND
TOTAL COUNT			75		
UNDERFLOW COUNT			954		
OVERFLOW COUNT			146		
1.36 CPU SECONDS			0.24		DISK SECONDS

END

OK, C 1 2 3 4 5 7
OK, C 10 11 12 14
OK, COMO -END

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EEEE P P P P L 66666
E P P P L 6
E P P P L 6
EEE P P P P P 66666
E P P P L 6 6
E P P L 6 6
EEEE P P L L L L 66666

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STARTLOO
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OLD = EPP.STLOWNS1.WINDO

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CONVERT
IN = OLD2
MIN = 1
MAX = 99
OUT = NEW1
1 = 1:99 %

```

```

FREQUENC
IN = OLD1
MIN = 1
MAX = 2
IN = NEW1
MIN = 0
MAX = 99
LEG = LEG.STLOWORN
LEG = LEG.STLOWNS

```

```

STOPLOOP
NEW = EPP.STLOFREQS04
NAM = *

```

FREQUENCY COUNT OF VARIABLE NEW1
 FREQUENCY COUNT OF LAND OWNERSHIP FOR AREA WITHIN T62N-71N AND
 R12W-21W (ST. LOUIS COUNTY)

FREQUENCY COUNT OF SUB VARIABLE OLD1
 FREQUENCY COUNT OF WATER ORIENTATION FOR AREA WITHIN T62N-71N AND
 AND R12W-21W (ST. LOUIS COUNTY)

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VARIABLE
: SUB VARIABLE
:
V V

```

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CLASS 0 SYMBOL
      0 0000
      1 0000
      2 0000
      1 AAAA
      1 AAAA
      2 AAAA

```

```

TOTAL COUNT
UNDERFLOW COUNT
OVERFLOW COUNT

```

11.51 CPU SECONDS

CELL COUNT	PERCENT	DESCRIPTION
3359	37.12	PRIVATE OWNERSHIP
950	26.28	ISLAND SHORELAND
2407	71.72	LAKE SHORELAND
5490	62.88	PUBLIC OWNERSHIP
595	10.46	ISLAND SHORELAND
5095	89.54	LAKE SHORELAND
9047		
21421		
10348		
	1.08	DISK SECONDS

END

```

K/ C 1 2 3 4 5 7
K/ C 10 11 12 14
K/ CORD -END

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EEEE E P P P P L 55555
E P P P P L 5
E P P P P L 5
EEE P P P P L 55555
E P P P P L 5
E P P P P L 5
EEEE E P P L L L L 55555

```

11

```

STARTLOO
OLD = EPP.KOOCWORN1.WINDO
OLD = EPP.KOOCOWNS1.WINDO

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```

CONVERT
IN = OLD2
MIN = 2
MAX = 99
OUT = NEW1
1 = 2.99 $

```

```

FREQUENC
IN = OLD1
MIN = 1
MAX = 2
IN = NEW1
MIN = 0
MAX = 99
LEG = LEG.KOOCWORN
LEG = LEG.KOOCOWNS

```

```

STOPLOOP
NEW = EPP.KOOCFRE0504
NAM = *

```

FREQUENCY COUNT OF VARIABLE NEW1
 FREQUENCY COUNT OF LAND OWNERSHIP FOR AREA WITHIN T62N-71N AND
 R22W-23W (KOOCHICHING COUNTY)

FREQUENCY COUNT OF SUB VARIABLE OLD1
 FREQUENCY COUNT OF WATER ORIENTATION FOR AREA WITHIN T62N-71N AND
 AND R22W-23W (KOOCHICHING COUNTY)

```

VARIABLE
: SUB VARIABLE
:
V V

```

```

CLASS 0 SYMBOL
      0000
      1 0000
      2 0000
      1 AAAA
      1 AAAA
      2 AAAA

```

```

TOTAL COUNT
UNDERFLOW COUNT
OVERFLOW COUNT
3.35 CPU SECONDS

```

CELL COUNT	PERCENT	DESCRIPTION
319	50.64	PRIVATE OWNERSHIP
127	39.94	ISLAND SHORELAND
191	60.06	LAKE SHORELAND
310	49.36	PUBLIC OWNERSHIP
42	13.55	ISLAND SHORELAND
268	85.45	LAKE SHORELAND
528		
6993		
2272		
0.75		DISK SECONDS

END

K, C 1 2 3 4 5 7
 K, C 10 11 12 14
 K, COMO -END

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E P P P P L 6
E P P P P L 6
EEE P P P P L 66666
E P P P L 6 6
E P P L 6 6
EEEE P P LLLL 66666

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STAR/LOO
OLD = EPP.ITASHORN2.WINDO

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FREQUENC
IN = OLD1
LEG = LEG.ITASHORN

```

```

STOPLOOP

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```

FREQUENCY COUNT OF VARIABLE OLD1
FREQUENCY COUNT OF WATER ORIENTATION FOR AREA WITHIN
T62N AND R22W-23W (ITASCA COUNTY)

```

CLASS	SYMBOL	COUNT	PERCENT	DESCRIPTION
3	0000	754	81.19	NOT ORIENTED TOWARD WATER
4	AAAA	1	0.09	ISLAND SHORELAND
10	BBBB	74	8.26	LAKE SHORELAND
11	CCCC	97	8.26	PERMANENT RIVER OR STREAM
12	DDDD	49	4.17	INTERMITTENT RIVER OR STREAM
TOTAL COUNT		1175		
UNDERFLOW COUNT		0		
OVERFLOW COUNT		0		
0.48 CPU SECONDS		0.00		DISK SECONDS

```

END

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```

K/ C 1 2 3 4 5 7
K/ C 10 11 12 14
K/ CONO -END

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EEEE P P P P P P P P L 55555
E P P P P P P P L 5
E P P P P P P P L 5
EE P P P P P P P P L 55555
E P P P P P P P L 5 5
E P P P P P P P L 5 5
EEEE P P L L L L 55555

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STARTLOO
OLD = EFF. STLOWORN2. WINDO

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FREQUENC
IN = OLD1
LEG = LEG. STLOWORN

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STOPLOOP

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FREQUENCY COUNT OF VARIABLE OLD1
 FREQUENCY COUNT OF WATER ORIENTATION FOR AREA WITHIN
 T42N-21W AND R12W-21W (ST. LOUIS COUNTY)

CLASS	SYMBOL	COUNT	PERCENT	DESCRIPTION
0	0000	21610	52.51	NOT ORIENTED TOWARD WATER
1	AAAA	1558	3.79	ISLAND SHORELAND
2	BBBB	7542	18.33	LAKE SHORELAND
3	CCCC	7127	17.32	PERMANENT RIVER OR STREAM
4	DDDD	1459	3.54	INTERMITTENT RIVER OR STREAM
5	EEEE	77	0.19	DRAINAGE DITCHES
6	FFFF	1780	4.33	WATER SURFACE (PARCEL COMPLETELY COVERED BY LAKE GREATER THAN 10 ACRES)
TOTAL COUNT		41152		
UNDERFLOW COUNT		0		
OVERFLOW COUNT		0		
4.36 CPU SECONDS		0.64 DISK SECONDS		

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END 1.00 22.11%

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K: C 1 2 3 4 5 7
K: C 10 11 12 14
K: COMD -END

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EEEE PFFFF PFFFF L 66666
E P P P P L 6
E P P P P L 6
EEE PFFFF PFFFF L 66666
E P P L 6 6
E P P L 6 6
EEEE P P LLLL 66666

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I II

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STARTLOO
OLD = EPP.KOOCHORN2.WINDO

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FREQUENC
IN = OLD1
LEG = LEG.KOOCHORN

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STOPLOOP

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FREQUENCY COUNT OF VARIABLE OLD1
 FREQUENCY COUNT OF WATER ORIENTATION FOR AREA WITHIN
 T62N-71N AND R22W-23W (KOOCHICHING COUNTY)

CLASS	SYMBOL	COUNT	PERCENT	DESCRIPTION
0	0000	5993	78.69	NOT ORIENTED TOWARD WATER
1	AAAA	169	1.71	ISLAND SHORELAND
2	BBBB	459	4.64	LAKE SHORELAND
3	CCCC	1591	15.98	PERMANENT RIVER OR STREAM
4	DDDD	175	1.77	INTERMITTENT RIVER OR STREAM
5	EEEE	141	1.63	DRAINAGE DITCHES
6	FFFF	345	3.49	WATER SURFACE (PARCEL COMPLETELY COVERED BY LAKE GREATER THAN 10 ACRES)
<u>TOTAL COUNT</u>		<u>7873</u>		
		62%	6.35%	

The Real Estate Buyers Guide...

GOVERNMENT

LANDS

Digest

SEPTEMBER 1980 VOL. 10, NO. 9 \$1.50 PER COPY

Purchasing Or Leasing Tax Forfeited Land in St. Louis County, Minn.

In St. Louis County there are approximately a million acres of tax forfeited land. This County is comprised of an area 60 miles wide and about 140 miles long. Because of the size of the County, it is necessary for an individual to select a specific area before an appraisal or an examination can be made for either sale or lease of the property.

Requests for land are made either by letter or personal appearance at the County Auditor's Office. At that time, it is indicated whether or not the request is for an appraisal for outright purchase or for lease. For an outright purchase the land must be also appraised and offered at public sale. These sales are held quarterly, on the second Wednesday of March and on the second Tuesdays of June, September and December. Interested parties must be present at the sale or have someone represent them. They may also remit by certified check in an amount they wish to bid over the minimum or appraised value listed. Any lands offered at these sales and not purchased at the time of offering, may be purchased over the counter in the Auditor's Office until such time as the said appraisal is cancelled. Appraisals are not cancelled until they are outdated at least two years.

There are several areas in St. Louis County set aside for Memorial Forest Reserves. In these areas it is the policy of the County and State to withhold land from public sale for the development of timber growth, sales management, and public recreational use. State law prohibits sale of tax forfeited lands involving streams, rivers or lake frontage. St. Louis County also has several areas set aside especially for mining. This does not mean that only mining companies have the opportunity to buy these lands but in most cases the price is beyond what an individual would be willing to pay.

The County has several hundred cabin sites on tax forfeited property throughout the County, particularly in isolated areas. These sites comprising approximately 2½ acres (or roughly a 330 foot square tract) may be leased. Within this area the lessee may more or less treat the site as his own. However, the territory beyond the leased area, if tax forfeited or property belonging to the State or Federal Government, may be used by the public for hunting, fishing or other general recreational use. The cost for such a lease is \$50.00 for the first year and \$25.00 per year, thereafter, renewable in advance. Lakeshore lease sites are only obtainable at a public auction lease sale which is normally held in the Spring. After the first year the lease fee for lakeshore property is \$50.00 per year. These tracts are usually staked out and given a site number and have sufficient land area to meet the present requirements of Planning and Zoning. Cabins and hunting shacks are subject to personal property tax.

Should you be interested in acquiring or leasing property in a specific area in St. Louis County, they will be very glad to hear from you. Should you like to have your name placed on the sales mailing list, please notify the County Auditor's Office, Room 214-GLD, Courthouse, Duluth, Minnesota 55802 and remit the sum of 25¢ for each listing. County maps are also available for 50¢ from the County Auditor's Office.

"Should you be interested in acquiring or leasing property in a specific area in St. Louis County, they will be very glad to hear from you." (Exhibit 26) This land that is available does not even include shoreline land because according to state statute this must be retained in public ownership. Mr. Fuller, St. Louis Auditor's Office, said he did not have an estimate of the acreage involved and computing such a number would be extremely time consuming as it would have to be done manually by sifting through over 7,000 pages of tax forfeited land legal descriptions.

Exhibit 27 is a characterization of lands yet to be acquired in the Voyageur National Park Project. Of the approximately 8,071 acres, there are 106 parcels that are parts of or whole islands and only six with road access. These six represent 2 percent of the total of the parcels. Of the other 98 percent, 36 percent are within one to six miles of dock, 33 percent are beyond six miles but less than fifteen miles and 31 percent are beyond fifteen miles to boat dock. This can be compared with the sales analyzed of which only 2 percent were beyond six miles to boat dock. The following brief synopsis of the major lakes in the study area shows those lakes with no public access or that have lakeshore or islands farther than six miles from public access points.

Major Lakes in Study Area with
Land Over Six Miles from Public Access

Rainy Lake
Black Bay

Major Lakes in Study Area
with No Public Access Points

Namakan Lake
Sand Point Lake
Johnson Lake
Trout Lake

The calculations in Exhibit 23 are based on 542 sales that Landmark Research has independently gathered from the courthouses of Koochiching and St. Louis Counties. These sales have been categorized into three basic categories: islands, lakeshore, and non-lakeshore land, and each category has been divided into acreage

CHARACTERIZATION OF LANDS YET TO BE ACQUIRED IN
VOYAGEUR NATIONAL PARK, AS OF JUNE, 1980 BY CATEGORIES

<u>Ownership</u>	<u>Subtotal Acres</u>	<u>Subtotal Waterfront Feet</u>	<u>No. of Islands (Part or Whole)</u>	<u>No. of Parcels with Road Access</u>	<u>Miles to Boat Dock²</u>		
					<u>1 to 6</u>	<u>6 to 15</u>	<u>More Than 15</u>
Kimberly Clark	1265.62	84,050	6	0	7	11	6
McCarthy	1459.11	62,300	10	1	8	4	9
All Other	<u>5346.64</u>	<u>417,750</u>	<u>90</u>	<u>5</u>	<u>74</u>	<u>67</u>	<u>61</u>
Total	8071.37	564,100	106	6 ¹	89	82	76
Percent of Total				2%	98%		
					<u>Percent of Water Access</u>		
					36%	33%	31%

¹Includes one lease only property

²Two parcels are uncoded

EXHIBIT 27

or lot categories. Because of the large number of transactions, a comparison of ratios or degrees of differences among the subgroups of sales is very meaningful. That is, comparing the central tendency of all parcels of lakeshore land to that of non-lakeshore land is a very good indicator of the relative worth of these two classes. For example, it can be seen that the sales price per acre of lakeshore subdivision lots to price of raw lakeshore acreage is approximately 5.1 to 1, that is, that lots sell for about five times as much as the underlying "raw" lakeshore acreage. This demonstrates the wholesaling and retailing concepts of subdivision development where the subdivider buys a larger parcel of land, makes improvements to it, and incurs certain holding costs as well as a markup for profit. These transactions indicate that in the study area, finished lots sell for five times more than raw land, or conversely, that the underlying land is approximately 20 percent of the retail lot price. It also can be seen that lots with water frontage when compared to lots without water frontage on an acre to acre basis are approximately 3.3 times higher in price or conversely, that non-lakeshore lots sell for a third of the price of lots with water frontage. Again from Exhibit 23, acreage with lake frontage when compared to acreage without water frontage sells for about 4.2 times as much, or conversely, that non-water frontage acreage is worth approximately 25 percent of the waterfront acreage.

SUMMARY

Guidelines for the analysis and valuation of the real property⁵ predicate its worth upon its highest and best use. Highest and best use is "...that use, from among reasonably probable and legal alternative uses, found to be physically possible, appropriately supported, financially feasible, and which results in the highest land value."⁶

Those limitations to physical development and adaptability or market support and concomitantly financial feasibility common to the lands within the study area and parcels to be acquired are:

- . Federal, state, and county regulations place major restrictions on the scale, size, and type of land development possibilities because of the physical factors and water resources of the land.
- . Soil types and underlying bedrock conditions in conjunction with slopes and swamp conditions greatly constrain development potential, for example, by limiting sewage disposal systems.
- . Groundwater conditions preclude future development of any size and surface water use constraints by regulatory agencies also adversely affect development possibilities.

There is already sufficient inventory of lots in existing platted subdivisions as demonstrated by average demand over the last ten years to last for fourteen years.

Based on an analysis of the current shorelands in private ownership and the demonstrated effective demand based on sales over the last ten years, there is sufficient private shoreland inventory to last for a century even if no land is resold during this period.

An analysis of these transactions further shows that raw land sells for approximately 20 percent of the retail price of a lot and water frontage sells for three to four times the price of nonshoreland.

⁵The Appraisal of Real Estate, Seventh Edition, American Institute of Real Estate Appraisers. See also, Uniform Appraisal Standards for Federal Land Acquisitions, Interagency Land Acquisition Conference, 1973.

⁶Real Estate Appraisal Terminology, p. 167, Sponsored by the American Institute of Real Estate Appraisers and the Society of Real Estate Appraisers (Cambridge, Mass.), 1975, Byrl N. Boyce, editor.

JAMES A. GRAASKAMP

PROFESSIONAL DESIGNATIONS

SREA, Senior Real Estate Analyst, Society of Real Estate Appraisers

CRE, Counselor of Real Estate, American Society of Real Estate
Counselors

CPCU, Certified Property Casualty Underwriter, College of Property
Underwriters

EDUCATION

Ph.D., Urban Land Economics and Risk Management - University of Wisconsin
Master of Business Administration - Marquette University
Bachelor of Arts - Rollins College

ACADEMIC HONORS

Chairman, Department of Real Estate and Urban Land Economics,
School of Business, University of Wisconsin
Urban Land Institute Research Fellow
University of Wisconsin Fellow, Omicron Delta Kappa
Lambda Alpha - Ely Chapter
Beta Gamma Sigma, William Kiekhof Teaching Award (1966)

PROFESSIONAL EXPERIENCE

Dr. Graaskamp is the President and founder of Landmark Research, Inc., which was established in 1968. He is also co-founder of a general contracting firm, and land development company and a farm investment corporation. He is co-designer and instructor of the EDUCARE teaching program for computer applications in the real estate industry. His work includes substantial and varied consulting and valuation assignments to include investment counseling to insurance companies and banks, court testimony as expert witness, and the market/financial analysis of various projects, both nationally and locally and for private and corporate investors and municipalities.

T I M W A R N E R

PROFESSIONAL DESIGNATIONS

MAI, Member, American Institute of Real Estate Appraisers,
Certificate Number 5645

SREA, Senior Real Estate Analyst, Society of Real Estate Appraisers

EDUCATION

Master of Science - Real Estate Appraisal and Investment Analysis -
University of Wisconsin

Bachelor of Arts - Marquette University - Milwaukee, Wisconsin

PROFESSIONAL EDUCATION

Society of Real Estate Appraisers

Appraising Real Property	Course 101
Appraising Income Producing Property	Course 201
Special Applications of Appraisal Analysis	Course 301
Instructor's Clinic	1975

American Institute of Real Estate Appraisers

Real Estate Appraisal I	Principles
Real Estate Appraisal II	Urban Properties
Real Estate Appraisal VI	Investment Analysis
Real Estate Appraisal VII	Industrial Properties
Real Estate Appraisal VIII	Residential Properties

Contemporary Real Estate Appraisal, University of
Wisconsin, 1977

PROFESSIONAL EXPERIENCE

Mr. Warner is currently associated with Landmark Research, Inc. Previously, he was associated with The Appraisal Company of Houston, Texas, and was the Manager of Appraisal Operations for Mortgage Guaranty Insurance Corporation. His experience includes appraisal, consulting, and market and financial analysis of proposed and existing projects; reuse and conversion studies; lease analysis and structuring; analysis of equity positions for financial institutions; analysis of proposed multiple land use developments for developers, investors, and financial institutions.

