

H. Grounds
4/4/67

**THIRD MONTHLY PROGRESS REPORT
LAKE SUPERIOR BASIN
COMPREHENSIVE WATER POLLUTION
CONTROL STUDY**

March, 1967

**UNITED STATES DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION**

**Great Lakes-Illinois River Basins Project
Chicago, Illinois**

Purpose

The purpose of this report is to summarize briefly the progress of the comprehensive water pollution control study of the Lake Superior Basin. Those present included Abbott, Risley, Buchanan, H. Hall, Fuller, Fisher, Scarce, Viktora and Verber with Grounds acting as chairman. It is the intent that progress reports completed monthly will keep the Region informed of activities in this area of its responsibility.

Summary

Work Completed to date includes:

1. Selection and placing of current meter stations in Lake Superior.
2. Collection of initial samples from seven stations in the Lake.
3. Chemical, biological, and radiological analyses of these samples.
4. Initial reconnaissance of waste sources along the St. Louis River.
5. Reconnaissance of possible laboratory sites.
6. Preparation of a preliminary draft of population and economy.
7. Completion of the first draft of the immediate needs reports concerning the St. Louis Basin, Minnesota and Wisconsin and the Montreal River Basin, Michigan and Wisconsin. (Copies were distributed to all present for staff review)

8. Completion of municipal waste inventory.
9. Initial evaluation of chemical and biological data.
10. Completion of the industrial waste source inventory.
(Exhibit # 1)
11. Completion of a brief literature search on the chemistry
of Lake Superior with graphs comparing our findings.
(Exhibit # 2)

Previous Progress Report

Previous assignments outlined in the second monthly progress report were discussed as follows:

Scarce-Fuller - Fuller completed a brief report on the chemical quality of Lake Superior. The report is attached as Exhibit 2. Generally literature values for total and soluble phosphate and for ammonia nitrogen were much higher than those based on samples collected by the Great Lakes Region Laboratory. According to Fuller, however, little or no information was available from the literature regarding either sampling locations or sampling procedures and techniques thus it is difficult to correlate our work and that contained in the literature. It was generally agreed that more sampling of Lake Superior is necessary if a better picture of existing water quality conditions is to be obtained. Seasonal variations at existing sampling stations should be determined.

Fisher - Fisher's assignment was completed and was contained in Exhibit 2 of the Second Monthly Progress Report. (See Exhibit 3 " ERRATA ".)

Verber-Ownbey - A Lake Superior Program Office director and other personnel specifically for this study have not been obtained. It appears

that we will not be able to hire such personnel at least until after June 30, 1967.

Minkin - Minkin (now with the Metropolitan Sanitary District of Greater Chicago) completed the industrial waste inventory for the Lake Superior Basin (Exhibit 1). Although this inventory locates almost all major industrial waste sources it does not in general give information concerning waste quantities and waste strengths.

Specific Assignments

1. Libby and Fisher are to prepare a plan for initial preliminary sampling and survey work which will identify polluted areas in the Basin. Emphasis should be placed upon the interstate waters of the St. Louis River Basin and Montreal River Basin, but the entire Lake Superior Watershed should be covered. The plan should be completed by Tuesday April 18 at 10:00 AM at which time a critique of the plan will be held. A Lake Superior study plan previously prepared by Libby is also to be reviewed at this time and suggestions are to be made for updating to fit present conditions.
2. Libby is to arrange for sampling aboard the Telson Queen during its approximate one week station pick up run this Spring. Stations sampled last Fall will be covered to determine seasonal variations, if any. (See Exhibit 4)
3. Abbott is to complete revision of the draft reports on interstate streams in the Lake Superior watershed by April 10. He was requested to work directly with Mr. Ownbey so that clarification of Washington's desires could be obtained.
4. H. Hall is to prepare a preliminary report concerning land use, fertilizer application and PO_4 loadings in the Lake Superior watershed. An initial draft should be completed by May 1, 1967.

EXHIBIT 1

INDUSTRIAL WASTE SOURCE INVENTORY LAKE
SUPERIOR WATERSHED

TABLE
PROVISIONAL
SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin: Lake Superior - WL 23	State Michigan	County						
Subbasin Montreal River Basin to Brush Point - WL 23A								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Cleveland Cliffs Iron Co.	Metal Mining	Insufficient Information (400# BOD/day)
Eagle Mills, Marquette Co.		
Cliff Shaft Mine	Metal Mining	Insufficient Information
Ishpeming, Marquette Co.		
Cliff Dow Chemical Co.	Chemicals and Allied Prods.	Insufficient Information
Marquette, Marquette Co.		
Copper Range Co.	Metal Mining	Insufficient Information
White Pine, Ontonagon Co.		
Ewen Farmers Coop. Creamery	Creamery	Insufficient Information
Ewen, Ontonagon Co.		
Huss-Ontonagon Pulp & Paper Co.	Pulp and Paper	Insufficient Information (6,000# BOD/day)
Ontonagon, Ontonagon Co.		
Matthew Kangas	Coin Operated Laundry	Insufficient Information
Bergland, Ontonagon Co.		
Ontonagon Valley Coop. Creamery	Creamery	Insufficient Information
Bruces Crossing, Ontonagon Co.		
White Pine Copper Co.	Metal Mining	Insufficient Information
White Pine, Ontonagon Co.		
Kimberly-Clark Corp.	Pulp and Paper Mfg.	Insufficient Information
Munising, Alger Co.		
Munising Paper Co.	Pulp and Paper Mfg.	Insufficient Information
Munising, Alger Co.		

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SOURCES OF SIGNIFICANT POLLUTION

Major Basin: Lake Superior - WL 23	State Michigan	County						
Subbasin								
Montreal River Basin to Brush Point - WL 23A								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Celotex Corp. L'Anse, Baraga Co.	Pulp & Paper Mfg.	Insufficient Information
Pelkie Cheese Co. Pelkie, Baraga Co.	Creamery	Insufficient Information
Youngstown Mines Corp. Ironwood, Gogebic Co.	Metal Mining	Insufficient Information
Calumet Hecla Co. Calumet, Houghton Co. (Two Plants?)	Metal Mining	Insufficient Information
Torch Lake Copper Smelting & Ref. Co. Torch Lake, Houghton Co.	Metal Mining	Insufficient Information
Copper Harbor Processing Co. Copper Harbor, Keweenaw Co.	Metal Mining	Insufficient Information
<u>MARQUETTE COUNTY</u> - Marquette and Presque Isle and Vicinity Docks, Wharves and Piers		
Lake Superior and Ishpeming RR.	X	Insufficient Information
Upper Peninsula Generaling Co.	X	Insufficient Information
Schneider Bros.	X	Insufficient Information
Lake Shore Inc.	X	Insufficient Information

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SOURCES OF SIGNIFICANT POLLUTION

Major Basin: Lake Superior - WL 23	State Michigan	County Marquette
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Subbasin
Montreal River Basin to Brush Point - WL 23A

Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)
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Industry & Location

Type of Industry,

Remarks

MARQUETTE COUNTY - Marquette and
Presque Isle and Vicinity Docks,
Wharves and Piers

Marquette Dock Co.	X	Insufficient Information
Campbell Supply Co.	X	Insufficient Information
Soo Line Ore Dock	X	Insufficient Information
International Oil Corp.	X	Insufficient Information
Texaco Inc.	X	Insufficient Information
Spear & Sons, Inc.	X	Insufficient Information
Michigan Gas and Electric Co.	X	Insufficient Information
Standard Oil Co.	X	Insufficient Information
State Prison, Marquette Branch	X	Insufficient Information

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SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County
Lake Superior WL23	Michigan	Alger
Subbasin		
Montreal River Basin to Brush Point - WL 23A		
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)
		Miles Above Last Jct. (4)
		Miles Above Mouth of Subbasin (5)
		Treat- ment (6)
		Estimated Population Connected to Sewers (7)
		Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)
		Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Alger County - Munising and Vicinity - Docks, Wharves, and Piers		
Kimberly - Clark Corp.	Pulp and Paper	Insufficient Information
Cleveland-Cliffs Iron Co.	Metal Mining	Insufficient Information
Munising Coal Co.	Coal Handling	Insufficient Information

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SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin: Lake Superior WL 23	State Michigan	County Houghton						
Subbasin Montreal River to Brush Point WL 23A								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

Industry & Location

Type of Industry

Remarks

Houghton County - Lake Linden and
Hubbell Docks, Wharves and Piers

Calumet & Hecla Leaching Plant	Metal Mining	Insufficient Information
Calumet & Hecla Smelting & Refining	Metal Mining	Insufficient Information
Calumet & Hecla Ahmeek Mill	Metal Mining	Insufficient Information
Calumet & Hecla Tamarack Reclamation	Metal Mining	Insufficient Information
Quincy Mining Company	Metal Mining	Insufficient Information

Houghton-Hancock

Bosch Brewing	Malt, Liquor Mfg.	Insufficient Information
Franklin Mine	Metal Mining	Insufficient Information
Quincy Mine No. 2	Metal Mining	Insufficient Information
Harrigan Oil Co.	Oil Industry	Insufficient Information
Quincy Mine Co.	Metal Mining	Insufficient Information
Superior Iron & Metal Co.	Metal Mining	Insufficient Information
U. P. Oil Co.	Oil Industry	Insufficient Information
Portage Coal & Dock Co.	Coal Handling	Insufficient Information
Standard Oil Co. (Dollar Bay)	Oil Industry	Insufficient Information

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SOURCES OF SIGNIFICANT POLLUTION

Major Basin: Lake Superior WL 23	State Michigan	County Baraga and Ontonagon						
Subbasin Montreal River to Brush Point - WL 23A								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Baraga County - L'Anse and Baraga Docks, Wharves and Piers		
Upper Peninsula Power Co.	X	Insufficient Information
Standard Oil Co.	Oil Industry	Insufficient Information
Armstrong-Thielman Lumber Co.	Lumber	Insufficient Information
Northwoods Lumber Co.	Lumber	Insufficient Information
Gitche Gumee Oil Co.	Oil Industry-Coal Handling	Insufficient Information
Ontonagon County - Ontonagon Docks, Sharves, Piers		
Hoerner Boxes-Huss Ontonagon Mill Co.	Paper Mfg.	Insufficient Information
Gitche-Gumee Oil Co.	Oil Industry	Insufficient Information
Hamar Quandt Co.	X	Insufficient Information

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SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County					
Lake Superior WL 23	Michigan and Wisconsin	Iron County, Wisconsin					
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Subbasin							
Montreal River Basin WL 23A-B							
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Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated Discharged (8) (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Ruppe Cement Pdts. Co. Hurley, Iron Co., Wisconsin	Cement Manufacturing	Insufficient Information

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SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County						
Lake Superior WL 23	Wisconsin							
Subbasin								
St. Louis River Basin to Montreal River Basin WL23B								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Poplar Canning Co.	Food Canning	Insufficient Information
Poplar, Douglas Co.		
Bayfield Cannery	Food Canning	Insufficient Information (120# BOD/day)
Bayfield, Bayfield Co.		
Benoit Coop. Creamery	Creamery	Insufficient Information (35# BOD/day)
Benoit, Bayfield Co.		
Bodin Fisheries	Fish Processing	Insufficient Information
Bayfield, Bayfield Co.		
Booth Fisheries	Fish Processing	Insufficient Information
Bayfield, Bayfield Co.		
Cornucopia Cheese Factory	Creamery-Cheese	Insufficient Information (40# BOD/day)
Cornucopia, Bayfield Co.		
Evertt Fisheries, Inc.	Fish Processing	Insufficient Information
Port Wing, Bayfield Co.		
Farmers Cheese Factory	Creamery-Cheese	Insufficient Information (10# BOD/day)
Mason, Bayfield Co.		
Fuhrman Cheese Factory	Creamery-Cheese	Insufficient Information (35# BOD/day)
Iron River, Bayfield Co.		
Fuhrman Sausage Co.	Food Processing-Meat	Insufficient Information (20# BOD/day)
Iron River, Bayfield Co.		
Martin's Dairy	Cheese Mfg.	Insufficient Information (27# BOD/day)
Cornucopia, Bayfield Co.		

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SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County						
Lake Superior WL 23	Wisconsin							
Subbasin								
St. Louis River Basin to Montreal River Basin WL 23B								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Mason Milk Products Mason, Bayfield Co.	Cheese Mfg.	Insufficient Information (22# BOD/day)
Moquah Cheese Factory Moquah, Bayfield Co.	Cheese Mfg.	Insufficient Information (35# BOD/day)
Du pont de Nemours Barksdale, Bayfield Co.	Chemical Mfg. (TNT)	Insufficient Information (100# BOD/day)
Sand Bay Fisheries Bayfield, Bayfield Co.	Fish Processing	Insufficient Information
Twin Ports Coop. Dairy Benoit, Bayfield Co.	Milk Receiving Station Creamery	Insufficient Information
American Can Co. Ashland Co.	Paper Mfg.	Insufficient Information (2000# BOD/day)
Andersonville Coop. Dairy Ass'n Ashland, Ashland Co.	Cheese Mfg.	Insufficient Information
Marathon-Amer. Can Co. Ashland, Ashland Co.	Paper Mfg.	Insufficient Information
Marathon Paper Co. Ashland, Ashland Co.	Paper Mfg.	Insufficient Information (360# BOD/day)
Marengo Coop. Dairy Ass'n Marengo, Ashland Co.	Creamery	Insufficient Information (30# BOD/day)
Mountain Valley Cheese Factory Ashland, Ashland Co.	Cheese Mfg.	Insufficient Information (30# BOD/day)

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SOURCES OF SIGNIFICANT POLLUTION

Major Basin: Lake Superior WL 23	State Wisconsin	County						
Subbasin St. Louis River Basin to Montreal River Basin WL 23B								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Penokee Veneer Co. Mellen, Ashland Co.	Wood Mfg.	Insufficient Information
Radloff Cheese Factory Highbridge, Ashland Co.	Cheese Mfg.	Insufficient Information
Belmonte Cheese Factory Saxon, Iron Co.	Cheese Mfg.	Insufficient Information (35# BOD/day)
Ashland, Ashland County Docks, Wharves and Piers		
Lake Superior District Power Co.	X	Insufficient Information
C. Reiss Coal Dock	Coal Handling	Insufficient Information
Soo Line R.R. Commercial Dock	Ore & Miscellaneous	Insufficient Information
U. S. Coast Guard Auxiliary Pier	X	Insufficient Information
Mowatt Dock - City of Ashland	X	Insufficient Information
Clarkson Coal Co.	Coal Handling	Insufficient Information

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SOURCES OF SIGNIFICANT POLLUTION

Major Basin: Lake Superior WL 23		State Wisconsin and Minnesota		County				
Subbasin St. Louis River WL 23B-C								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
St. Louis County, Minn. Duluth and Vicinity		
Superior-Superwood Corp.	Pulp and Paper	Insufficient Information
American Steel & Wire Co.	Metal Mfg.	Insufficient Information
Barnes Duluth Shipyard	Metal Mfgering	Insufficient Information
Elliott Packing Co.	Meat Packing	Insufficient Information
Interlake Iron Corp.	Metal Mfg.	Insufficient Information
Chun King Corp.	Food Mfg.	Insufficient Information
Western Paint Co.	Chemicals and Paints	Insufficient Information
Universal Atlas Cement Co.	Cement	Insufficient Information
Minn. Power & Light Co.	Power	Insufficient Information
National Iron Co.	Metal	Insufficient Information
Duluth Brass Co.	Metal	Insufficient Information
Globe-Duluth Iron Works	Metal	Insufficient Information
Clyde Iron Works	Metal	Insufficient Information
Scott Graff Co.	X	Insufficient Information
Great Lakes Storage & Contracting Co.	X	Insufficient Information
Occidental Elevator	Grain	Insufficient Information
Wilderness Food Products	Food Mfg.	Insufficient Information
Chisholm Ranee Sandgrover Gravel Co.	Quarry	Insufficient Information
Meadowlands Cheese Factory	Creamery	Insufficient Information
Wrenshaw Int. Refineries	Petroleum Refining	Insufficient Information

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SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County						
Lake Superior WL 23	Wisconsin and Minnesota							
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Subbasin								
St. Louis River Basin WL 23B-C								
<hr/>								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Douglas County, Wisconsin Superior and Vicinity		
The Great Northern R.R. (Allouez)	Repair, Oil Cars	Insufficient Information
Great Northern R. R. (Albany Yard)	Clean Tank Cars	Insufficient Information
Great Northern R. R. (Superior Yard)	Repair Cars	Insufficient Information
Koppers Co. Inc.	Lumber	Insufficient Information
Lake Head Pipeline	Petroleum Pdts.	Insufficient Information
Lake Superior Refining	Petroleum Pdts.	Insufficient Information
Murphy Oil Co.	Petroleum Refining	Insufficient Information
Soo Line R.R. Co.	Clear RR Cars	Insufficient Information
Superior Fiber Products, Inc.	Pulp and Paper	Insufficient Information (8400# BOD/day)
Stott Briquet Co.	Coal Handling	Insufficient Information
Union Tank Car Co.	Metal Mfgering	Insufficient Information
American Barke Shoe Co.	Metal Mfgering	Insufficient Information
Northern Brewery	Brewery	Insufficient Information
Russell Creamery Co.	Creamery	Insufficient Information
Twin Ports Coop. Dairy	Creamery	Insufficient Information

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SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County
Lake Superior WL 23	Minnesota	St. Louis
Subbasin		
St. Louis River Basin WL 23B-C		
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)
		Miles Above Last Jct. (4)
		Miles Above Mouth of Subbasin (5)
		Treat- ment (6)
		Estimated Population Connected to Sewers (7)
		Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)
		Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Aurora: Taconite Plant	Metal Mining	Insufficient Information
Aurora: St. James Mine	Metal Mining	Insufficient Information
Babbitt: Babbitt Taconite Plant	Metal Mining	Insufficient Information
Balkan Twp: Forster Mine	Metal Mining	Insufficient Information
Biwabik: Biwabik Conc. Plant (Serves Biwabik, Cass, Williams Mines)	Metal Mining	Insufficient Information
Biwabik: Canton Mine	Metal Mining	Insufficient Information
Biwabik: Embarrass Mine	Metal Mining	Insufficient Information
Biwabik: Hector Mine	Metal Mining	Insufficient Information (May have closed System)
Biwabik: Higgins Mine	Metal Mining	Insufficient Information
Biwabik: Biwabik Mary Ellen Conc. Plant (Serves Mary Ellen Mine)	Metal Mining	Insufficient Information (May have closed System)
Biwabik: Ruddy Mine	Metal Mining	Insufficient Information
Biwabik: Emmett Mine	Metal Mining	Insufficient Information
Buhl: Buhl Margaret Mine (Serves Wanless and Woodbride Mines)	Metal Mining	Insufficient Information
Buhl: Horth Shiras Mine	Metal Mining	Insufficient Information
Buhl: Whiteside Mine	Metal Mining	Insufficient Information
Chisholm: Duncan Conc. Plant (Serves Fraser, Duncan, Douglas Mines)	Metal Mining	Insufficient Information

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SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County						
Lake Superior WL 23	Minnesota	St. Louis						
Subbasin								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Chisholm: Glen Mine	Metal Mining	Insufficient Information
Chisholm: Godfrey Mine	Metal Mining	Insufficient Information
Chisholm: Humphrey Mine	Metal Mining	Insufficient Information
Chisholm: Leonard Mine	Metal Mining	Insufficient Information
Chisholm: Leonard Burt Mine	Metal Mining	Insufficient Information
Chisholm: Monroe Tenner Mine	Metal Mining	Insufficient Information
Chisholm: Pillsbury Mine	Metal Mining	Insufficient Information
Eveleth: Coons Pacific Conc. Plant	Metal Mining	Insufficient Information (May have closed system)
Eveleth: Fayal Mine	Metal Mining	Insufficient Information
Eveleth: Genoa Conc. Plant-Sparta	Metal Mining	Insufficient Information
Eveleth: Hull Nelson Mine	Metal Mining	Insufficient Information
Eveleth: Spruce Mine	Metal Mining	Insufficient Information
Eveleth: Troy Mine	Metal Mining	Insufficient Information
Eveleth: Virginia Conc. Plant	Metal Mining	Insufficient Information
Eveleth: Virginia Mine	Metal Mining	Insufficient Information
Fayal Township: Julia Mine	Metal Mining	Insufficient Information
Franklin: Missabe Mt. Mine	Metal Mining	Insufficient Information
Franklin: Norman Mine	Metal Mining	Insufficient Information
Franklin: Yawkey Mine	Metal Mining	Insufficient Information
Fraser: Dunwoody Mine	Metal Mining	Insufficient Information

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SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County
Lake Superior WL 23	Minnesota	St. Louis
Subbasin		
St. Louis River Basin WL 23B-C		
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)
		Miles Above Last Jct. (4)
		Miles Above Mouth of Subbasin (5)
		Treat- ment (6)
		Estimated Population Connected to Sewers (7)
		Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)
		Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Fraser: Elbern Mine	Metal Mining	Insufficient Information
Fraser: Sherman Mine	Metal Mining	Insufficient Information
(Serves: St. Clair, Shenango, Croxtton, Fraser, Hartley, Burt Mines)		
Gilbert: Genoa-Sparta Mine	Metal Mining	Insufficient Information
Gilbert: Gilbert Silver Mine	Metal Mining	Insufficient Information
Gilbert: Mariska Mine & Conc.	Metal Mining	Insufficient Information
Gilbert: Schley Conc. Plant	Metal Mining	Insufficient Information
(Serves Gilbert, Pettit, Sheley Mines)		
Great Scott Twp: Judson Mine	Metal Mining	Insufficient Information
Hibbing: Albany Mine	Metal Mining	Insufficient Information
Hibbing: Albany Washing Plant	Metal Mining	Insufficient Information
Hibbing: Hull-Rusk Group of Mines-7	Metal Mining	Insufficient Information
Hibbing: Longyear Conc. Plant	Metal Mining	Insufficient Information
Hibbing: Longyear Mine	Metal Mining	Insufficient Information
Hibbing: Mahoning Conc. Plant	Metal Mining	Insufficient Information
(Serves Mahoning Mine, Stuntz Twp. 4 Mines, Stuntz Twp. 6 Mines)		

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SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County						
Lake Superior WL 23	Minnesota	St. Louis						
Subbasin								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct: (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Hibbing: Morris Mine	Metal Mining	Insufficient Information
Hibbing: Scranton Conc. Plant	Metal Mining	Insufficient Information
Hibbing: Scranton Mine	Metal Mining	Insufficient Information
Hibbing: Sellers Triangle Mine	Metal Mining	Insufficient Information
Hibbing: South Longyear Mine	Metal Mining	Insufficient Information
Hibbing: South Rust Mine	Metal Mining	Insufficient Information
Hibbing: Susquehanna Mine	Metal Mining	Insufficient Information
Hibbing: UNO Conc. Plant	Metal Mining	Insufficient Information (May have closed system)
Hibbing: Webb Conc. Plant	Metal Mining	Insufficient Information
Hibbing: Webb Mine	Metal Mining	Insufficient Information
Hibbing: Weggum Conc. Plant	Metal Mining	Insufficient Information
Hibbing: Weggum Mine	Metal Mining	Insufficient Information
Kelley Lake: Nordine Mine	Metal Mining	Insufficient Information
Kinney: Atkins Mine	Metal Mining	Insufficient Information
Kinney: Dormer Mine	Metal Mining	Insufficient Information
Kinney: Forsyth Mine	Metal Mining	Insufficient Information
Kinney: Kinney Mine-Midway Mine (Serves Seville Mine)	Metal Mining	Insufficient Information
Kinney: Wade Mine	Metal Mining	Insufficient Information
Leonidas: Leonidas Mine	Metal Mining	Insufficient Information
McKinley: Corsica Conc. Plant	Metal Mining	Insufficient Information
McKinley: Corsica Mine	Metal Mining	Insufficient Information

TABLE
PROVISIONAL
SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County						
Lake Superior WL 23	Minnesota	St. Louis						
Subbasin								
St. Louis River Basin WL 23B-C								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Mesaba: Knox Mine	Metal Mining	Insufficient Information
Mesaba: Graham Mine	Metal Mining	Insufficient Information
Mesaba Twp: Wentworth Conc. Plant (Serves Wentworth #1 and #2 Mines)	Metal Mining	Insufficient Information
Mountain Iron: Hannah Mine	Metal Mining	Insufficient Information
Mountain Iron: Mott Mine	Metal Mining	Insufficient Information
Mountain Iron: Mountain Iron Conc. Pl. (Serves Mountain Iron Mine, Pilotac Taconite Plant, Snively Mine #1)	Metal Mining	Insufficient Information
Mountain Iron: Pilot Mine	Metal Mining	Insufficient Information
Mountain Iron: Pilot Annex Mine	Metal Mining	Insufficient Information
Mountain Iron: Wacootah Mine	Metal Mining	Insufficient Information
Mountain Iron: Wheeling Mine	Metal Mining	Insufficient Information
Mountain Iron: Pilotac Mine	Metal Mining	Insufficient Information
Virginia: Auburn Mine	Metal Mining	Insufficient Information
Virginia: Charleston Conc. Plant	Metal Mining	Insufficient Information
Virginia: Columbia Conc. Plant	Metal Mining	Insufficient Information
Virginia: Columbia Mine	Metal Mining	Insufficient Information
Virginia: Enterprise Mine	Metal Mining	Insufficient Information

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SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County
Lake Superior WL 23	Minnesota	St. Louis
Subbasin		

Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)
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<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Virginia: Extaca Taconite Mine	Metal Mining	Insufficient Information
Virginia: Great Western Mine	Metal Mining	Insufficient Information
Virginia: Julia Conc. Plant	Metal Mining	Insufficient Information
Virginia: Minnewas Mine	Metal Mining	Insufficient Information
Virginia: Prindle Conc. Plant	Metal Mining	Insufficient Information
Virginia: Prindle Mine	Metal Mining	Insufficient Information
Virginia: Rouchleau Mine	Metal Mining	Insufficient Information
(Serves Franklin, Lone Star, Moose, Ohio, Shaw Mines)		
White Township: Pacific Mine	Metal Mining	Insufficient Information
Mouri Twp: Sidney Mine	Metal Mining	Insufficient Information

TABLE
PROVISIONAL
SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County						
Lake Superior WL 23	Wisconsin and Minnesota	St. Louis						
<hr/>								
Subbasin								
St. Louis River Basin WL 23B-C								
<hr/>								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

Industry & Location

Remarks

St. Louis County, Minn.
Docks, Wharves and Piers

DULUTH HARBOR BASIN, MINN., PT.

1. U. S. Coast Guard Buoy Pier	Insufficient Information
2. U. S. Coast Guard Life Boat Station	Insufficient Information
3. Industrial Welders and Machinists, Inc. Dock	Insufficient Information
4. Lake Head Boat Basin, Inc. Dock	Insufficient Information
5. Twin Ports Docking and Assistance Co. Pier	Insufficient Information
6. Lake Head Boat Basin, Inc. Marine Railway Pier	Insufficient Information

DULUTH HARBOR BASIN

7. Corps of Engineers, South Pier	Insufficient Information
8. Corps of Engineers, North Pier	Insufficient Information
9. Lennys Food Dock	Insufficient Information

DULUTH HARBOR BASIN, LAKE AVENUE SLIP

10. Sam Johnson and Sons Fisheries Pier	Insufficient Information
11. Modern Constructors Dock	Insufficient Information
12. Marine Iron and Shipbuilding Co. Wharf	Insufficient Information

TABLE
PROVISIONAL
SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County	St. Louis				
Lake Superior WL 23	Wisconsin and Minnesota						
Subbasin							
St. Louis River Basin WL 23B-C							
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated Discharged (8) (9)

Industry & Location

Remarks

St. Louis County, Minn.
Docks, Wharves and Piers

DULUTH HARBOR BASIN

13. Marshall-Wells Co. Dock	Insufficient Information
14. Twin Ports Grocer Co. Dock	Insufficient Information
15. North Star Terminal and Dock Co. Docks #5 and #6	Insufficient Information
16. Duluth Iron and Metal Co. Dock #1	Insufficient Information
17. 5th Avenue Dock	Insufficient Information
18. Flame Excursions Dock	Insufficient Information
19. Commerce Slip Wharf	Insufficient Information
20. Northern Pacific Railway Dock #4	Insufficient Information
21. Northern Pacific Railway Dock #3	Insufficient Information
22. Northern Cold Storage and Warehouse Dock	Insufficient Information
23. Chicago and Northwestern Railway Co. Clip No. 2 Dock	Insufficient Information
24. Huron Portland Cement Co., Duluth Plant Dock	Insufficient Information
25. Cutler-Magner Co., Limestone Dock	Insufficient Information
26. Duluth Terminal and Cold Storage Co. Pier	Insufficient Information
27. Soo Line Railroad 10th Ave. Pier	Insufficient Information
28. Cutler-Magner Co. Salt Plant Pier	Insufficient Information
29. Great Lakes Towing Co. Repair Dock	Insufficient Information

TABLE
PROVISIONAL
SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin: Lake Superior WL 23	State Wisconsin and Minnesota	County St. Louis
Subbasin		
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)
		Miles Above Last Jct. (4)
		Miles Above Mouth of Subbasin (5)
		Treat- ment (6)
		Estimated Population Connected to Sewers (7)
		Estimated Sewered Population Equivalent (BOD Basis) Untreated Discharged (8) (9)

Industry & Location

Remarks

St. Louis County, Minn.
Docks, Wharves and Piers

DULUTH HARBOR BASIN (Continued)

30. Zenith Dredge Co. Dock	Insufficient Information
31. Zenith Dredge Co. , Main Yard Dock	Insufficient Information
32. Northern Pacific Railway Dock No. 2	Insufficient Information
33. General Mills Elevator A. Elevator	Insufficient Information
34. Superwood Corp. Dock	Insufficient Information
35. North Western-Hanna Fuel Dock No. 3	Insufficient Information
36. Lakehead Scrap Terminal Co. Dock	Insufficient Information
37. Cargill Grain Elevators, E. H. and I Dock	Insufficient Information
38. Carnegie Dock and Fuel Co. Dock No. 1	Insufficient Information
39. Capitol Elevator Co. Dock	Insufficient Information
40. Duluth Iron and Metal Co. Dock No. 2	Insufficient Information
41. F. H. Peavey, Occident Elevator Dock	Insufficient Information
42. F. H. Peavey and Co. Peavey Elevator Dock	Insufficient Information
43. Arthur M. Clure Public Marine Dock Terminal Mooring Dock	Insufficient Information
44. Arthur M. Clure Public Marine Crane Wharf	Insufficient Information
45. Arthur M. Clure Public Marine Terminal Transit Shed Wharf	Insufficient Information
46. Arthur M. Clure Public Marine Terminal Wharf	Insufficient Information
47. Mickey's Sanitary Service Dock	Insufficient Information
48. Northern Pacific Railway, Rices Point Pier	Insufficient Information

TABLE
PROVISIONAL
SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County						
Lake Superior WL 23	Wisconsin and Minnesota	St. Louis						
Subbasin								
St. Louis River Basin WL 23B-C								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

Industry & Location

Remarks

St. Louis County, Minn.
Docks, Wharves and Piers.

ST. LOUIS BAY

49. Whitney Corporation Dock	Insufficient Information
50. City of Duluth, Sewage Plant Dock	Insufficient Information
51. Duluth, Missabe and Iron Range Railway Coal Dock	Insufficient Information

ST. LOUIS BAY, NORTH CHANNEL

52. Duluth, Missabe and Iron Range Railway Limestone Pier	Insufficient Information
53. Duluth, Missabe and Iron Range Railway Ore Dock #6	Insufficient Information
54. Duluth, Missabe and Iron Range Railway Ore Docks Tug Dock	Insufficient Information
55. Duluth, Missabe and Iron Range Railway Ore Dock #5	Insufficient Information
56. North Western-Hanna Fuel Co. Dock #5	Insufficient Information
57. American Dock and Warehousing Co. Pier	Insufficient Information
58. Berwind Fuel Co. Dock #2	Insufficient Information
59. Inland Coal and Dock Co. Coal Dock	Insufficient Information
60. Duluth Dock and Transport Co. Dock	Insufficient Information
61. Left Bank-St. Louis R., Minn. Channel Interlake Iron Corp., Duluth Plant Dock	Insufficient Information
62. Barnes Duluth Shipbuilding Co. Riverside Yard Pier #3	Insufficient Information
63. Barnes Duluth Shipbuilding Co. Riverside Yard Pier #2	Insufficient Information
64. Barnes Duluth Shipbuilding Co. Riverside Yard Pier #1	Insufficient Information

TABLE
PROVISIONAL
SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County						
Lake Superior WL 23	Wisconsin and Minnesota	Douglas County, Wisconsin						
<hr/>								
Subbasin								
St. Louis River Basin WL 23B-c								
<hr/>								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

Industry & Location

Remarks

Douglas County, Wis.
Docks, Wharves and Piers

SUPERIOR, WISCONSIN

65. The C. Reiss Coal Company Superior Coal Dock	Insufficient Information
66. Berwind Fuel Co. Dock #1	Insufficient Information

ST. LOUIS BAY, SOUTH CHANNEL

67. Standard Oil Dock	Insufficient Information
68. Great Lakes Coal and Dock Co. Dock	Insufficient Information
69. Shell Oil Co. and Murphy Corp. Oil Dock	Insufficient Information
70. United States Gypsum Co. Dock	Insufficient Information
71. Great Northern Railway Co. Merchandise Dock	Insufficient Information
72. Pure Oil Co. and Texaco, Inc. Dock	Insufficient Information
73. Great Northern Railway Co., Grain Elevator Dock #5	Insufficient Information
74. F. W. Peavey and Co. Globe Elevator Dock	Insufficient Information
75. Paper Clameson and Co. Dock	Insufficient Information

HOWARD'S BAY

76. Speakes Co. Dock	Insufficient Information
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TABLE
PROVISIONAL
SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County						
Lake Superior WL23	Wisconsin and Minnesota	Douglas County, Wisconsin						
<hr/>								
Subbasin								
St. Louis River Basin WL 23B-C								
<hr/>								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

Industry & Location

Remarks

HOWARD'S BAY (Continued)

77. Lake Traffic Supply Co. Dock	Insufficient Information
78. Whitney Dock	Insufficient Information
79. Farmers Union Tower Bay Slip Grain Elevator Dock	Insufficient Information
80. Farmers Union Tower Bay Slip Grain Gallery Dock	Insufficient Information
81. Farmers Union Hughitt Slip Grain Elevator Dock	Insufficient Information
82. Fraser-Nelson Shipbuilding and Dry Dock Co., Hughitt Dock	Insufficient Information
83. Fraser-Nelson Shipbuilding and Dry Dock Co., Cumming Dock	Insufficient Information
84. Fraser-Nelson Shipbuilding and Dry Dock Co., Building Way 3 North Dock	Insufficient Information
85. Fraser-Nelson Shipbuilding and Dry Dock Co., Buildings Ways 3 South and 2 North Dock	Insufficient Information
86. Fraser-Nelson Shipbuilding and Dry Dock Co., Building Ways 2 South and 3 North Dock	Insufficient Information
87. Fraser-Nelson Shipbuilding and Dry Dock Co., Building Way 1 South Dock	Insufficient Information
88. Fraser-Nelson Shipbuilding and Dry Dock Co. Outfitting Dock	Insufficient Information
89. Fraser-Nelson Shipbuilding & Dry Dock Co. Graving Dock Wharf	Insufficient Information
90. Fraser-Nelson Shipbuilding and Dry Dock Co. Mooring Dock	Insufficient Information

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PROVISIONAL
SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County						
Lake Superior WL 23	Wisconsin and Minnesota	Douglas County, Wisconsin						
<hr/>								
Subbasin								
St. Louis River Basin WL 23B-C								
<hr/>								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

Industry and Location

Remarks

Douglas County, Wisconsin
Docks, Wharves and Piers

CONNERS POINT

91. Soo Line Railroad Conners Point Dock	Insufficient Information
92. Great Lakes Storage and Contracting Co. Dock	Insufficient Information
93. Youngioghenny and Ohio Coal Co. Dock	Insufficient Information

SUPERIOR BAY, SUPERIOR FRONT CHANNEL

94. Bacich and Park Dock	Insufficient Information
95. Hallet and Carey Dock Co. Grain Dock	Insufficient Information
96. Marine Fueling Dock	Insufficient Information
97. Cutler-La Liberte-McDougall Corp. Limestone Dock	Insufficient Information
98. Huron Portland Cement Co. Dock	Insufficient Information
99. Cutler-La Liberte-McDougall Corp. Mooring Dock	Insufficient Information

SUPERIOR BAY

100. Barkers Island Dock	Insufficient Information
101. Osborne-McMillan Elevator O. Dock	Insufficient Information
102. Osborne-McMillan Elevator M. Dock	Insufficient Information

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PROVISIONAL
SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County					
Lake Superior WL 23	Wisconsin and Minnesota	Douglas County, Wisconsin					
<hr/>							
Subbasin							
St. Louis River Basin WL 23B-C							
<hr/>							
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated Discharged (8) (9)

Industry & Location

Remarks

Douglas County, Wisconsin
Docks, Wharves and Piers

SUPERIOR BAY, SUPERIOR HARBOR BASIN

103. Osborne-McMillan Elevator Co. Mooring Dock	Insufficient Information
104. King Midas Flour Mills Dock	Insufficient Information
105. Lakehead Pipe Line Co. Dock	Insufficient Information
106. Northern Pacific Railway Ore Dock	Insufficient Information
107. Great Northern Railway Ore Dock No. 1	Insufficient Information
108. Great Northern Railway Ore Dock No. 2	Insufficient Information
109. Great Northern Railway Ore Docks Tug Wharf	Insufficient Information
110. Great Northern Railway Ore Dock No. 4	Insufficient Information
111. Northwestern-Hanna Fuel Co. Dock No. 1	Insufficient Information

ALLOUEZ BAY, SOUTH SIDE OF ALLOUEZ BAY CHANNEL

112. Chicago and Northwestern Railway Mooring Dock	Insufficient Information
113. Cargill Itasca Grain Elevator Dock	Insufficient Information.

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PROVISIONAL
SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County						
Lake Superior WL 23	Wisconsin and Minnesota	Carlton County, Minn.						
<hr/>								
Subbasin								
St. Louis River Basin WL 23B-C								
<hr/>								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Northwest Paper Co. Cloquet	Pulp and Paper	Insufficient Information
Cloquet Wood Conversion Co.	Pulp and Paper	Insufficient Information

TABLE
PROVISIONAL
SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County					
Lake Superior WL 23	Wisconsin and Minnesota	Itasca County, Minn.					
Subbasin							
St. Louis River Basin WL 23B-C							
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated Discharged (8) (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
Carlz Concentrating Plant Keewatin	Metal Mining	Insufficient Information
(Serres: Hibbing Agnew Group- 4 Mines	Metal Mining	Insufficient Information
(Serres: Kelly Lake Morton Mine)	Metal Mining	Insufficient Information
(Serres: Stuntz Twp. South Eddy Mine)	Metal Mining	Insufficient Information
Carlz No. 2 Mine - Keewatin	Metal Mining	Insufficient Information

Note: Keewatin Community is in Upper Mississippi River Basin - UM3.

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SUMMARY SHEET - INDUSTRIAL WASTE INVENTORY

SOURCES OF SIGNIFICANT POLLUTION

Major Basin:	State	County						
Lake Superior WL 23	Minnesota	Lake and Cook						
Subbasin								
Lake Superior Northshore St. Louis River Basis to US-Canada Border - WL 23-C								
Community, Sewer or Sanitary District, Institution (1)	Receiving Stream (Direct) (2)	Loca- tion Level (3)	Miles Above Last Jct. (4)	Miles Above Mouth of Subbasin (5)	Treat- ment (6)	Estimated Population Connected to Sewers (7)	Estimated Sewered Population Equivalent (BOD Basis) Untreated (8)	Discharged (9)

<u>Industry & Location</u>	<u>Type of Industry</u>	<u>Remarks</u>
E. W. Davis Works Silver Bay, Lake Co.	Metal Mining	Insufficient Information
Reserve Mining Co. Silver Bay, Lake Co.	Metal Mining	Insufficient Information
Erie Mining Co. Taconite Harbor, Cook Co.	Metal Mining	Insufficient Information

EXHIBIT 2

**COMPARISON OF LAKE SUPERIOR DATA
THE OTHER GREAT LAKES AND LITERATURE
VALUES FOR LAKE SUPERIOR (ANALYTICAL
RESULTS)**

COMPARISON OF LAKE SUPERIOR DATA, THE OTHER GREAT LAKES, AND LITERATURE VALUES FOR LAKE SUPERIOR

Inshore

Figure 1 presents a comparison of total phosphate values (as PO_4) found in literature and those we found at inshore stations in Lake Superior and those in the other Great Lakes.

The range of values found in literature were 16 times greater than we found, and the averages were 0.03 and 0.04 mg/l, respectively. Lake Ontario had a range of values 195 times greater than Lake Superior and an average value four times higher.

Figure 2 presents a comparison of total soluble phosphate values (as PO_4) found in the other four Great Lakes and those found in Lake Superior. The range of values found in the other Great Lakes ranged from 6 to 520 times greater than in Lake Superior and the average values ranged 0.03 to 0.19 mg/l, compared to 0.03 in Lake Superior. The only average values equal to Lake Superior were found in the Central and Eastern Basins of Lake Erie. The Western Basin of Lake Erie showed an average value of 0.10 mg/l.

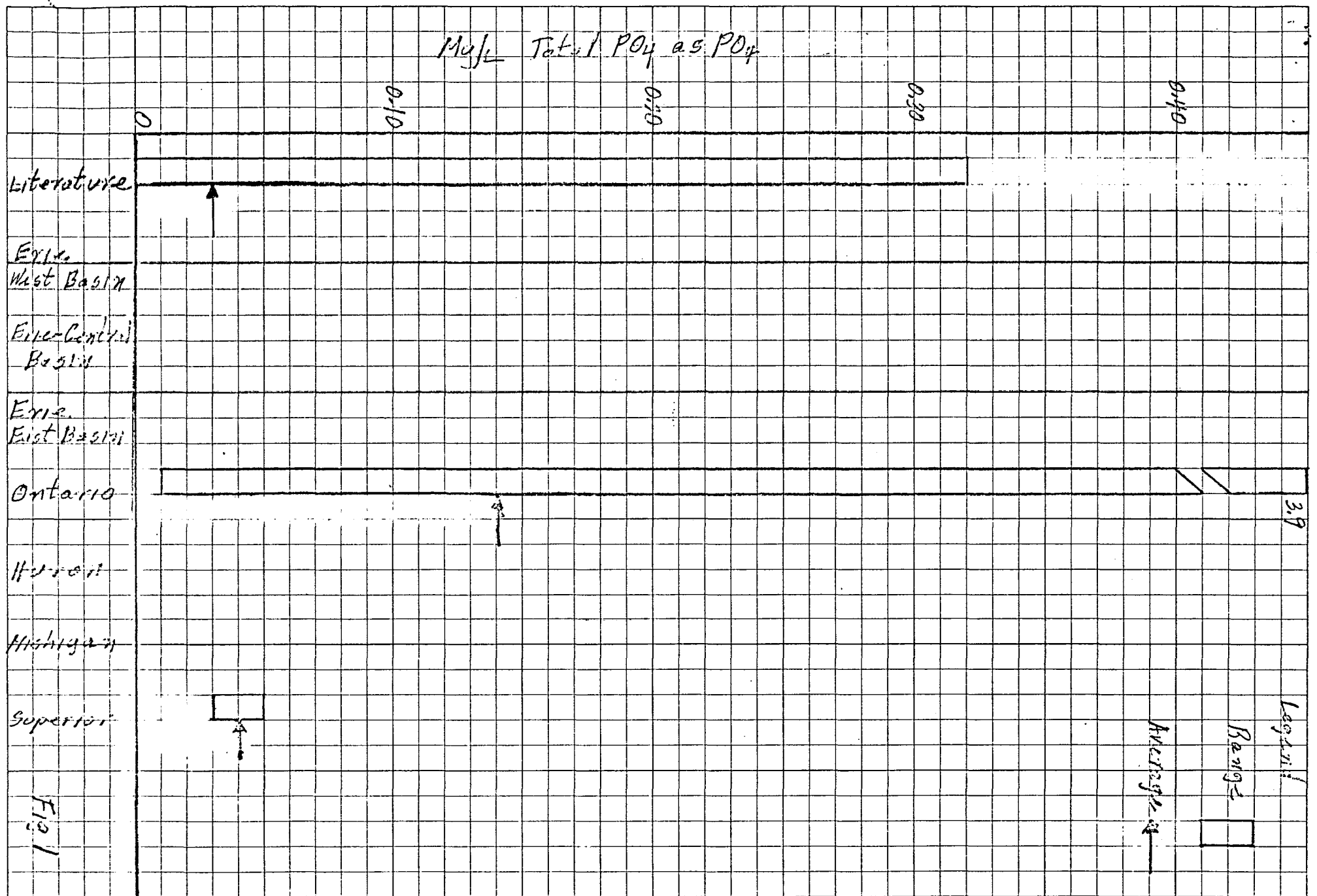
Figure 3 presents a comparison of ammonia nitrogen values found in literature, and those we found at inshore stations in Lake Superior and those found in the other Great Lakes. The Range of values and the averages were much higher than those found in Lake Superior.

Figure 4 presents a comparison of nitrate nitrogen values found in literature and those observed at inshore stations in Lake Superior and those found in the other Great Lakes. The range of values quoted in literature were eight times higher than our values, and the average literature value was 0.07 mg/l higher. The range of values in the other Great Lakes were from 2.5 to 62 times higher than in Lake Superior. The average values for the other Great Lakes ranged from 0.02 to 0.07 mg/l lower than Lake Superior with the exception of Lake Ontario, which was 0.02 mg/l higher.

All the other parameters were much lower in Lake Superior compared to the other Great Lakes, with the exception of pH, which was only slightly lower. Literature values were in good agreement with our analytical results with the exception of silica, which was twice as high in the literature. Specific conductance values from literature were about 20 micromhos lower than our results, and pH values were slightly lower.

It is not known why the silica values do not agree. The method employed in the analyses was not stated in the literature. Specific conductance readings were low in the literature because the test was not run at the proper temperature (25° C).

Mu/L Total PO_4 as PO_4



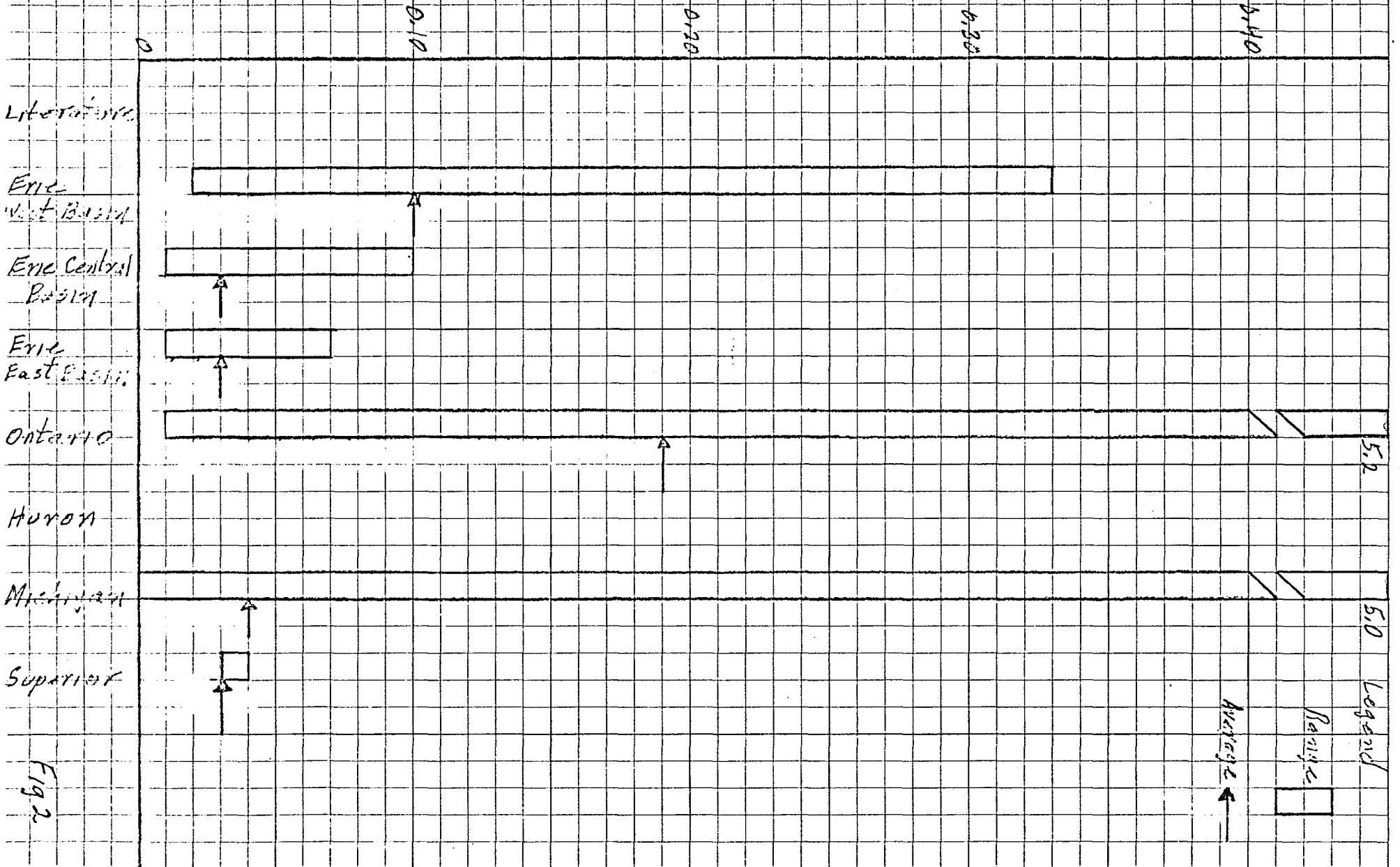
Legend

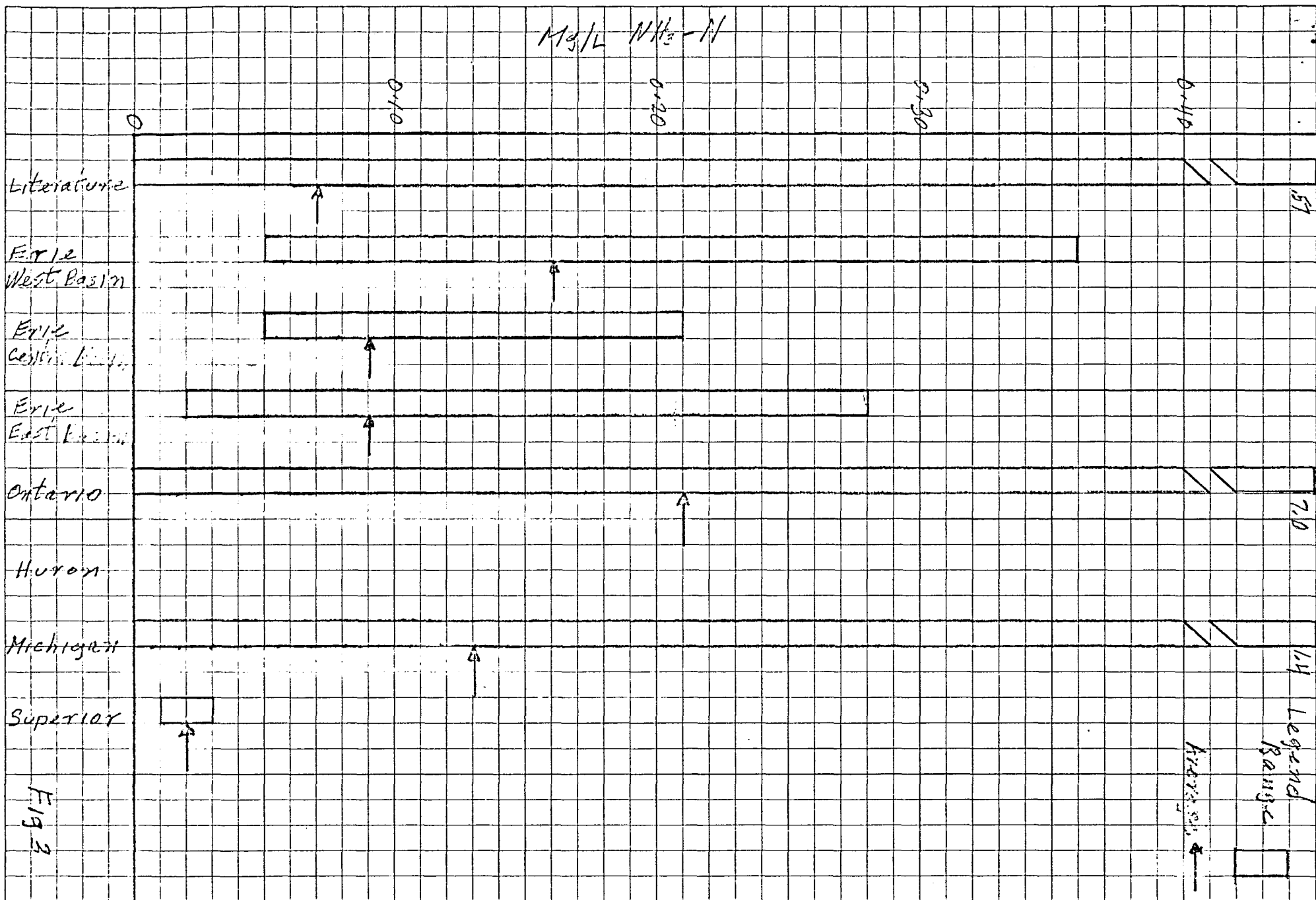
Range

Average

Fig 1

Mg/L Total Soluble PO_4 as PO_4





$Mg/L NO_3-N$

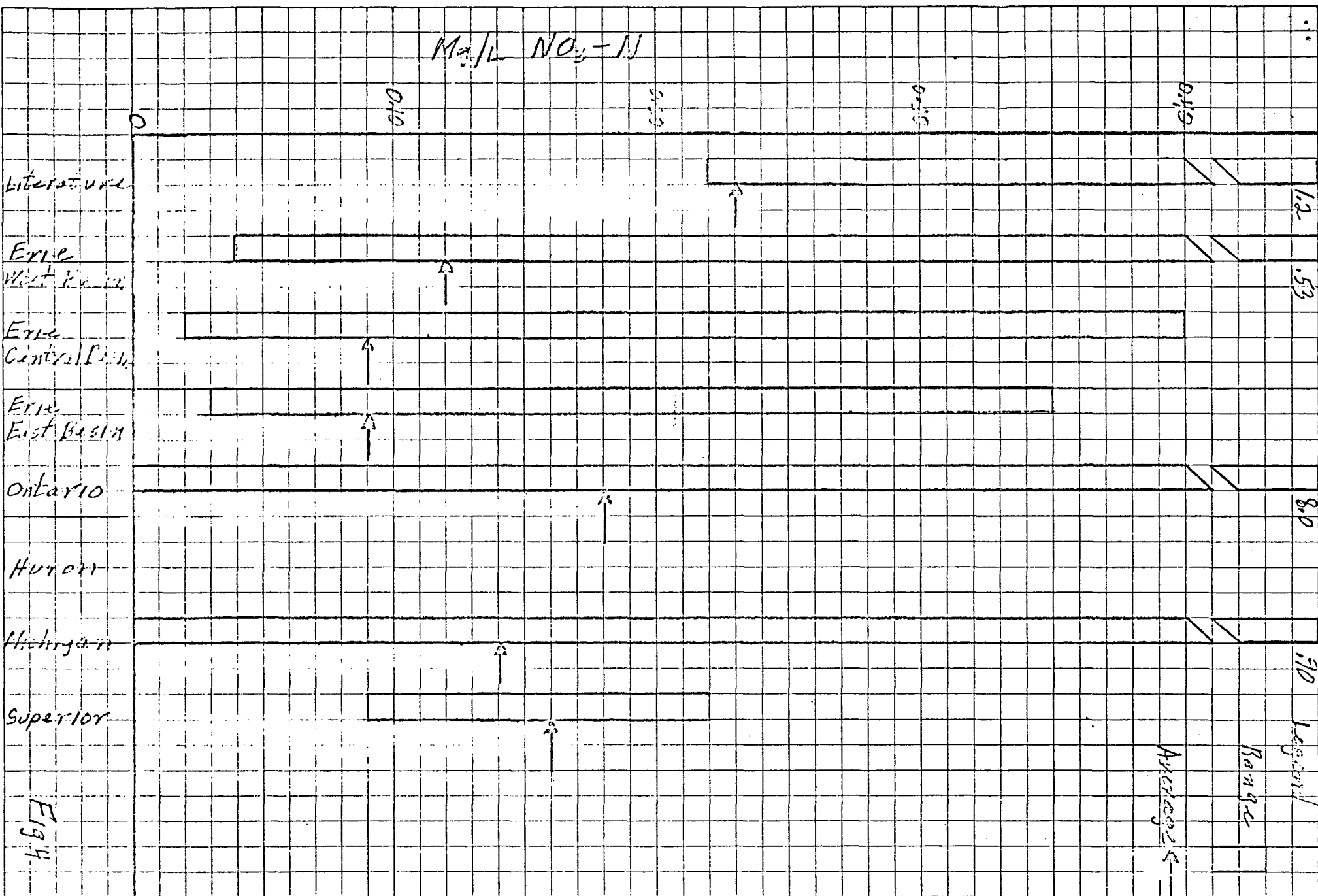


Fig 14

TABLE 1a
COMPARISON OF INSHORE DATA OF THE GREAT LAKES
All values expressed in mg/l

Parameter	Lake Ontario		Lake Erie		Lake Huron		Lake Michigan		Lake Superior	
	Average	Range	Average	Range	Average	Range	Average	Range	Average	Range
Temp. °C **			18	4-29			12	1-25	7.5	5-10
DO	10.6	ND-17					10	3.7-16	11	11-12
% Saturation							102	43-118	106	102-111
BOD	1.3	< 1-10					1.4	ND-8.6	NS	NS
NH ₃ -N	0.21	ND-7.0	W 0.16	0.005-0.36			0.13	ND-1.4	0.02	0.01-0.03
			C 0.09	0.05-0.21						
			E 0.09	0.02-0.28						
NO ₃ -N	0.18	ND-8.0	0.12	0.04-0.53			0.14	ND-0.90	0.16	0.09-0.22
			0.09	0.02-0.40						
			0.09	0.03-0.35						
Organic-N	0.33	ND-10.1	0.36				0.21	0.01-0.70	0.07	0.02-0.34
			0.35							
			0.24							
Total Sol. PO ₄ as PO ₄	0.19	0.01-5.2	0.10	0.02-0.33	0.03 and lower		0.04	ND-5.0	0.03	0.03-0.04
			0.03	0.01-0.10						
			0.03	0.01-0.07						
Total PO ₄ as PO ₄	0.14	0.01-3.9			0.04 and lower		NS	NS	0.04	0.03-0.05
SiO ₂	0.69	0.10-6.4	1.20	0.50-2.5			1.7	0.40-4.4	2.1	1.9-2.3
			0.68	0.31-2.9						
			0.47	0.25-2.0						
Na	29	8-90	9.9	6.3-14			4.0	1.8-7.5	1.2	1.1-1.5
			11	10-14						
			11	10-13						
K	1.8	1-4.4	1.5	1.1-2.5			1.2	0.50-3.8	0.7	0.50-2.1
			1.3	1.2-1.5						
			1.3	1.2-1.6						
Dissolved Solids	238	111-953	162	131-199			175	86-810	61	54-72
			178	159-196						
			179	162-195						
Spec. Cond. (μ mhos/cm)	364	132-1100	272	223-322			285	33-1130	105	97-110
			300	277-337						
			301	292-317						
pH (pH units)	-	7.1-9.6						6.4-9.3		6.1-7.5
Alkalinity	99	42-216					105	70-210	43	40-59

TABLE 1b
COMPARISON OF INSHORE DATA OF THE GREAT LAKES
All values expressed in mg/l

Parameter	Lake Ontario		Lake Erie		Lake Huron		Lake Michigan		Lake Superior	
	Average	Range	Average	Range	Average	Range	Average	Range	Average	Range
Ca	46	23-128	34 40 41	30-38 37-43 39-42			35	17-40	14	14-14
Mg	10	4-27	9 10 10	8-10 10-11 9-11			12	7-14	2.8	2.7-2.9
Cl	33	4-144	21 25 24	13-30 22-33 23-28			7.1	1.5-94	1.4	1.1-2.4
SO ₄	40	23-200	18 22 23	12-27 19-29 20-27			20	10-76	2.5	2.1-3.3
Phenols (µg/l)*							2	ND-32	NS	NS
COD			10 7.1 7.5	4.1-20 4.7-9.9 5.6-17			NS	NS	9	2-14

NS - not sampled

ND - none detected

* - µg/l

** - L. Erie and L. Michigan temp. taken from printouts

W - West Basin

C - Central Basin

E - East Basin

TABLE 2a
COMPARISON OF DEEPWATER DATA OF THE GREAT LAKES
All values expressed in mg/l

Parameter	Lake Ontario		Lake Erie		Lake Huron		Lake Michigan		Lake Superior	
	Average	Range	Average	Range	Average	Range	Average	Range	Average	Range
Temp. °C **	10.3	2-26.5	18	1-29			12	2-25	7.5	5-10
DO	8.1	7.1-16.5					12	8.4-17	11	11-12
% Saturation							102	73-152	106	102-111
BOD	0.6	41-7.8					NS	NS	NS	NS
NH ₃ -N	0.06	ND-0.42	W 0.16	0.05-0.36			0.06	ND-0.50	0.02	0.01-0.03
			C 0.09	0.05-0.21						
			E 0.09	0.02-0.28						
			0.12	0.04-0.53						
			0.09	0.02-0.40						
NO ₃ -N	0.31	ND-0.87	0.09	0.03-0.35			0.13	ND-0.65	0.16	0.09-0.22
Organic-N	0.24	ND-1.51	0.36				0.19	ND-0.52	0.07	0.02-0.31
			0.25							
			0.24							
Total Sol. PO ₄ as PO ₄	0.04	0.001-0.11	0.10	0.02-0.33			0.02	ND-0.14	0.03	0.03-0.01
			0.03	0.01-0.10						
			0.03	0.01-0.07	0.03 and lower					
Total PO ₄ as PO ₄	0.04	0.001-0.15			0.04 and lower		NS	NS	0.04	0.03-0.05
SiO ₂	0.83	.08-5.9	1.20	0.50-2.5			2.5	0.60-5.5	2.1	1.9-2.3
			0.68	0.31-2.9						
			0.47	0.25-2.0						
			9.9	6.3-14						
			11	10-14						
			11	10-13						
Na	12.5	11.4-13.4	11	10-13			3.9	2.7-6.5	1.2	1.1-1.5
K	1.6	1.3-2.1	1.5	1.1-2.5			1.1	.04-2.0	0.70	0.50-2.1
			1.3	1.2-1.5						
			1.3	1.2-1.6						
			1.3	1.2-1.6						
Dissolved Solids	183	114-243	162	131-199			155	100-240	61	54-72
			178	159-196						
			179	162-195						
Spec. Cond. (μ mhos/cm)	317	270-380	272	223-322			260	185-345	105	97-110
			300	277-337						
			301	292-317						
pH (pH units)		7.3-9.2						7.5-8.9		6.1-7.5
Alkalinity	97	71-161					110	75-130	43	40-59
			34							
			40							
Ca	58	9-103	41				33	25-40	14	14-14

TABLE 2 b
COMPARISON OF DEEPWATER DATA OF THE GREAT LAKES
All values expressed in mg/l

Parameter	Lake Ontario		Lake Erie		Lake Huron		Lake Michigan		Lake Superior	
	Average	Range	Average	Range	Average	Range	Average	Range	Average	Range
Mg	9.2	7.4-11.4	9	8-10			12	8-16	2.8	2.7-2.9
			10	10-11						
			10	9-11						
Cl	25	22-27	21	13-30			6.5	3.3-11	1.4	1.1-2.4
			25	22-33						
			24	23-28						
SO ₄	31	25-49	18	12-27			20	12-30	2.5	2.1-3.3
			22	19-29						
			23	20-27						
Phenols (µg/l)*							NS	NS	NS	NS
COD	7.3	0.4-23	10	4.1-20			NS	NS	9	2-14
			7.1	4.7-9.9						
			7.5	5.6-17						

NS - not sampled

ND - none detected

* - µg/l

** - L. Erie and L. Michigan temp. taken from printouts

W - West Basin

C - Central Basin

E - East Basin

BIBLIOGRAPHY OF LITERATURE SEARCH

1. Lake Superior, Lake Huron and Georgian Bay Report - 1960: Preliminary Report #12, Great Lakes Institute, University of Toronto. G. K. Rodgers (March 1963).
2. Lake Superior Study - 1956: School of Public Health, University of Minnesota (June 1957).
3. Lake Superior: Limnological Data 1951-1957: Special Scientific Report - Fisheries No. 297. Published by the U. S. Department of the Interior, Fish and Wildlife Service (April 1959).
4. An Investigation of Nutrients in Western Lake Superior 1959-1960: School of Public Health, University of Minnesota (June 1960).
5. Georgian Bay and Lake Superior Data Report - 1961: Preliminary Report #4, Great Lakes Institute, University of Toronto.
6. A Preliminary Investigation of Nutrients in Western Lake Superior 1958-1959: School of Public Health, University of Minnesota (June 1959).

EXHIBIT 3

A DISCUSSION ON BIOLOGICAL FINDINGS
OF THE LAKE SUPERIOR SPECIAL CRUISE
OCTOBER-NOVEMBER 1966
(ERRATA)

ERRATA

A DISCUSSION ON BIOLOGICAL FINDINGS
OF THE
LAKE SUPERIOR SPECIAL CRUISE

OCTOBER-NOVEMBER 1966

- (1) Page 6, 3rd paragraph:

Delete

In the northern part of Lake Michigan and in the deepwater stations in the southern part, 500 or less amphipods per square meter were recorded b/:

Substitute

Schuytema and Powers (1966) reported a mean benthic population of 630 organisms per square meter in samples collected at 39 offshore stations in Lake Huron in 1965.

- (2) Last page under b/:

Delete

June

Substitute

August

- (3) List of References:

Add (between Putnam, H. D. and T. A. Olson 1961 and Smith, S. I. 1871 a):

Schuytema, G. A. and R. E. Powers. 1966. The Distribution of Benthic Fauna in Lake Huron. University of Michigan, Great Lakes Research Division, Pub. 15: 155-163.

EXHIBIT 4

DETAIL OF ASSIGNMENT R. W. LIBBY