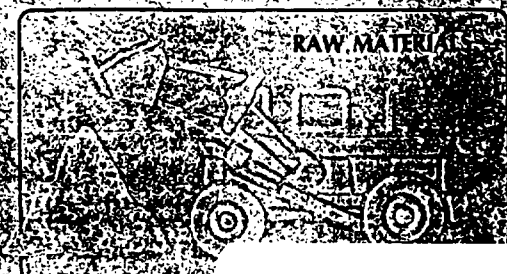
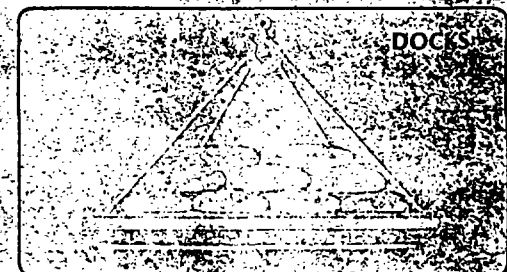
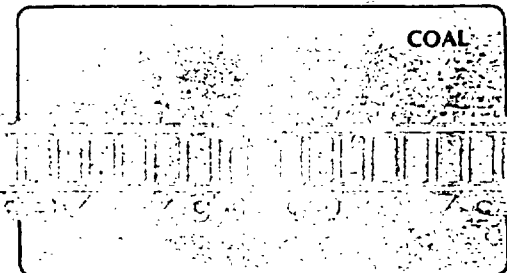
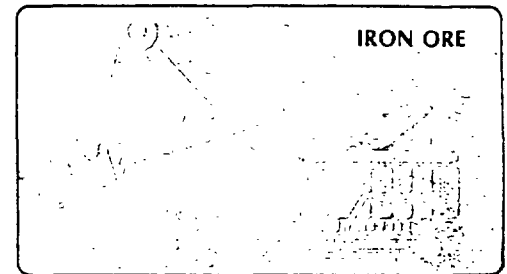
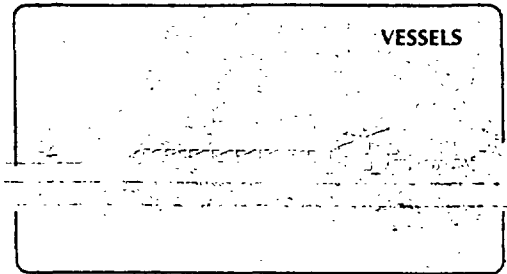
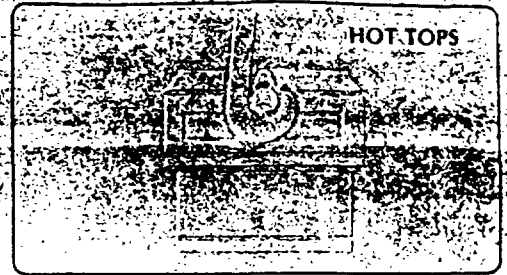


PLAINTIFF'S
EXHIBIT
ON-3B



OGLEBAY NORTON COMPANY

FACILITIES/SERVICES/PRODUCTS

FE003473



This 1967 Sales Book brings you up-to-date information on Oglebay Norton Company's activities. Our facilities and customer services are set forth in the areas of hot tops; lake transportation; iron ore; coal; docks; and raw materials. Pertinent statistical data is given in each case.

Call or write our headquarters in Cleveland if you need more detailed answers to fit your particular requirements. We are here to serve you.

OGLEBAY NORTON COMPANY 1967 FACILITIES/SERVICES/PRODUCTS

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EXECUTIVE OFFICE

1200 Hanna Building • Cleveland, Ohio 44115 • 861-3300 • Cable Address: ONCO—CLEVE

WHOM TO CONTACT

COLUMBIA TRANSPORTATION DIVISION • A. B. Cozzens, Vice President-Vessel Operations

FERRO ENGINEERING DIVISION • G. A. Peterson, Senior Vice President-General Manager

IRON ORE & RAW MATERIALS • A. B. Rathbone, Vice President-Ore Sales

COAL • G. F. Kisker, Director of Coal Sales

DOCKS: SAGINAW & BAY CITY • A. B. Cozzens, Vice President-Vessel Operations

TOLEDO OVERSEAS TERMINALS CO. • C. J. Howley, Jr., Vice President-Toledo Overseas Terminals Co.

BRANCH OFFICES

CINCINNATI, OHIO 45202 • 139 East Fourth Street • 381-6590

DETROIT, MICHIGAN 48226 • 1834 Guardian Building • 963-1277

DULUTH, MINNESOTA 55802 • 200 Christie Building • 722-6386

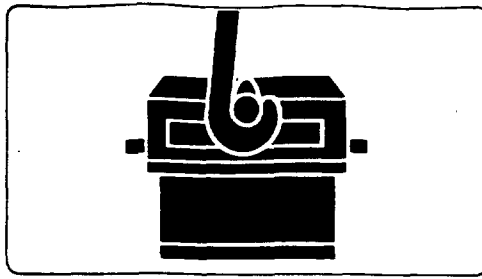
ST. CLAIRSVILLE, OHIO 43950 • P. O. Box 156 • 695-1134

SUBSIDIARIES

CABIN CREEK COAL SALES COMPANY • 139 East Fourth Street • Cincinnati, Ohio 45202 • 381-6590

TOLEDO OVERSEAS TERMINALS CO. • Box 306, Presque Isle, Station "A" • Toledo, Ohio 43605 • 726-2605

SILLOC LIMITED • 417-419 Queen's Quay West • Toronto 2B, Ontario, Canada • 366-9511



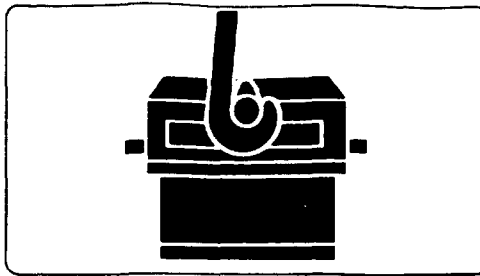
Hot Tops

The Ferro Engineering Division continues to expand its efforts to provide steel plants with complete hot topping service. Our extensive production and research facilities at Cleveland and Chicago have added a new dimension to our traditional Ferro service — working with steel producers to meet constantly changing requirements for newer and better quality steel products.

A new research laboratory is being constructed in Cleveland and our experienced research staff has been increased. We are constantly exploring new methods and means for increasing sound ingot yield. Manufacturing and inventory storage facilities have also been enlarged to fulfill our customers' requirements for prompt, customized shipments.

Ferro's Low Volume C&D Hot Top with the "Panel Insert and Stepped Ring Combination" has gained popularity among steel producers as an alternate to wet veneer practice in Low Volume C&D Hot Tops and is also replacing the Standard C&D Hot Tops lined with heavy duty firebrick. Ferro's new "Ferrobord," a thin-wall, highly insulating hot top for use with both billet and slab steel ingots, is also making great headway.

Our staff of experienced metallurgical, industrial engineering and ceramic specialists is always ready to assist you in developing the most efficient use of our products. We are proud of our tradition of providing the nation's steel makers with the highest quality hot topping materials best suited to the individual needs of each customer. They know, too, that they can count on Ferro's product line for quality, service and dependability.

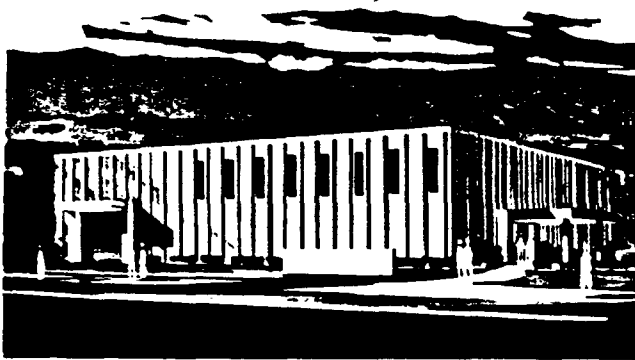


1 Architectural drawing of Ferro's new research facilities. Additionally, Ferro sponsors outside research to render increased service to steel plant operations.

2 & 3 In order to be able to fulfill customers' needs, Ferro maintains large inventories of its many products. Warehouse space has recently been expanded in all Ferro Plants to provide speedy delivery service for our customers.

4 & 5 Ferro's Low Volume Insulated Hot Tops and Wrap-Up Inserts enable steel producing customers to increase yields, improve quality and lower their costs. The ability to reconstruct and reuse this equipment with minimum repair time results in rapid equipment turnover and low labor costs.

6 Ferro's C&D Hot Top Covers which combine exothermic and insulating materials provide a simple method of applying a warm covering practice to steel ingots to prevent excessive heat loss resulting in higher ingot to bloom yields. The combination of these covers with C&D Low Volume Hot Tops provides the ultimate in hot top efficiency.



1



2 & 3



4 & 5

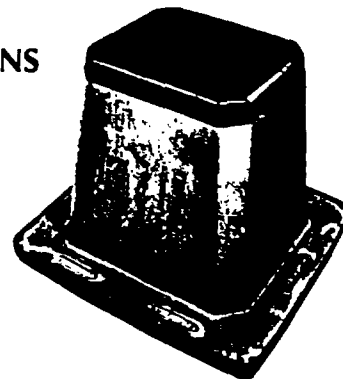


6

Photos 4, 5, and 6 Courtesy Cincinnati Steel Company of America

C&D PANEL INSERT—STEPPED RING COMBINATIONS

C&D, patented, Wrap-Up Panel Inserts are assembled on a flexible corrugated board backing to make an accurate, flat assembly which can be stacked one on another on pallets, then banded into a package for ease of shipping and storage in steel plants. Each new Panel Insert is folded into a multisided hollow shape, which fits accurately inside the lining and Stepped Ring of the Low Volume Hot Top, forming a protection for the lining against the molten steel. While the ingots are solidifying the Panel Inserts disintegrate, thereby facilitating the removal of the hot tops from the ingots.



C&D FERROBOARD HOT TOPS

C&D Ferroboard Hot Tops are one-use insulating hot tops, fabricated from separate panels, and are lightweight, extremely efficient, and easy to handle. Ferroboard Hot Tops can be furnished for any size and type of ingot mold, and are particularly adaptable to Big End Down slab and billet mold practice where steel plant production requires hot topping flexibility to operate a multiplicity of ingot mold sizes.

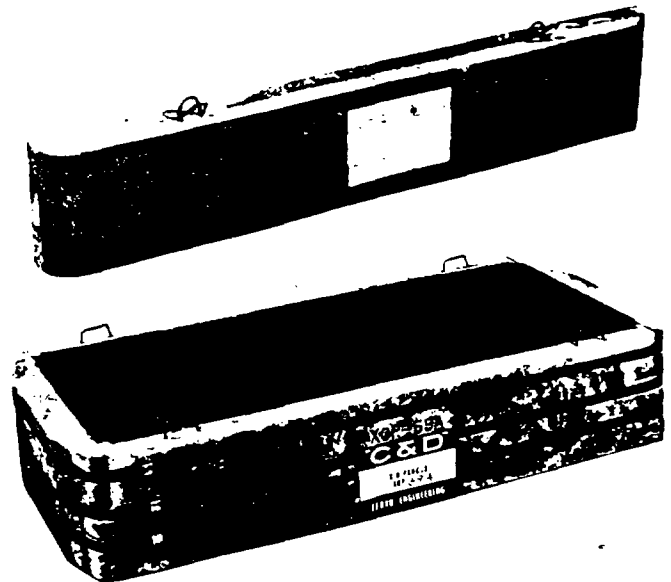


Photo Courtesy of Inland Steel Company

C&D X-O PANEL HOT TOPS

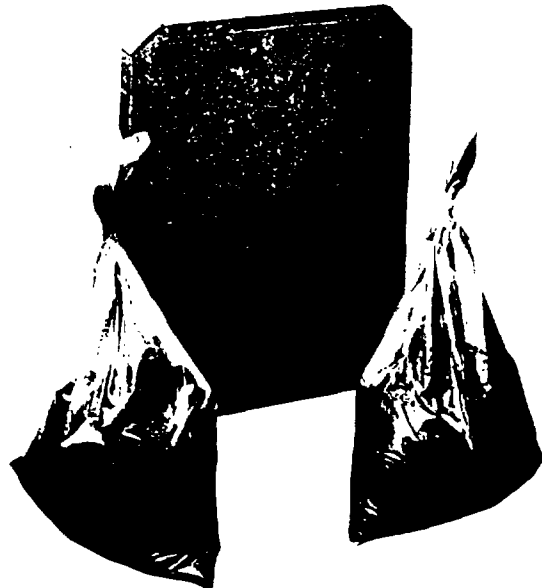
C&D X-O Panels are one-use exothermic hot tops. Fabricated of individual panels, X-O Panels are designed for application to either Big End Up or Big End Down ingot molds. X-O Panels can be shipped flat, and are assembled and banded with steel strapping or hung in the molds in the customer's plant.

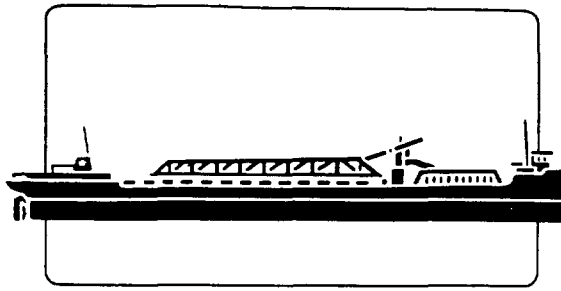
C&D X-O Panels provide excellent hot top efficiency and ingot yield.



C&D HOT TOP COVERS AND HOT TOP COVERING COMPOUNDS

C&D Hot Top Covers are scientifically designed to control sinkhead cooling. Exothermic and insulating materials are packaged in exact proportion for the specific ingot for which the cover is used. The patented C&D Covers provide a systematic, standardized covering practice in which exothermic materials are not wasted, ingot yields are greater and inventories are simplified. Also available are bagged exothermic covering compounds in several different grades.





Vessels

Our Columbia Transportation Division offers a versatility unmatched by any other Great Lakes vessel fleet. Different types of cargo need different kinds of treatment, and Columbia's diversified fleet, with its years of experience in handling all kinds of cargoes, is best suited to meet customer needs.

Eighteen vessels are operated by the Division, with four types of cargo-handling equipment; bulk, self-unloader, crane and crane-conveyor vessels. The Pringle Barge Line also operates a tug self-unloading barge unit.

With increased emphasis on modernization, upgrading, conversions and acquisitions for its fleet, Columbia provides efficient and dependable service to its shippers. Less efficient units are retired from active service.

Our active bulk freighter fleet includes four vessels which have a cargo-carrying capacity in excess of 20,000 tons. In 1966, the Edmund Fitzgerald carried a record-breaking single cargo of 26,071 gross tons of taconite pellets.

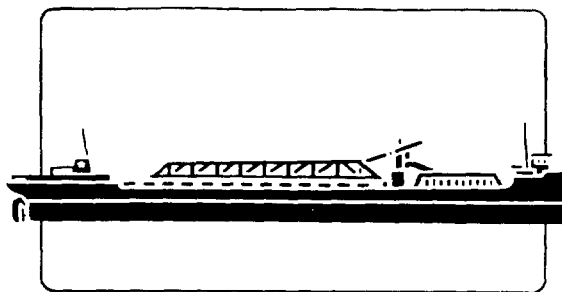
Our self-unloader fleet contains several vessels with the latest in unloading equipment and time-saving, service-aiding bow thrusters. The largest unit is the recently converted M/V Joseph H. Frantz, with a cargo-carrying capacity of 13,600 tons, which can unload cargo at the rate of 4,000 tons per hour. This vessel is equipped with an 800 H.P. electrically driven bow thruster.

The ships of the crane fleet, which is the largest such fleet on the Great Lakes, are capable of loading and unloading cargo without the aid of shore-side equipment.

The Robert C. Norton is the only crane-conveyor vessel operated on the Great Lakes. This unique vessel, which will be reboilered this year, provides the maximum in cargo-handling flexibility.

The overall trip capacity of the fleet is now 230,000 gross tons. Last year, we carried a record-breaking tonnage of over 18,000,000, an increase of more than 10% over 1965.

Columbia strives constantly to keep fast and efficient vessels on the Great Lakes to meet the requirements of its shippers

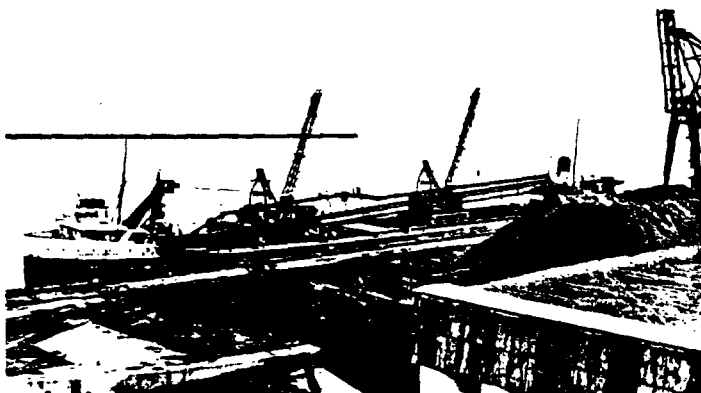


1 The Robert C. Norton, a crane-conveyor vessel equipped with a bow thruster, is capable of a high degree of maneuverability in restricted waters. She has the ability to operate as either a crane vessel or a self-unloader.

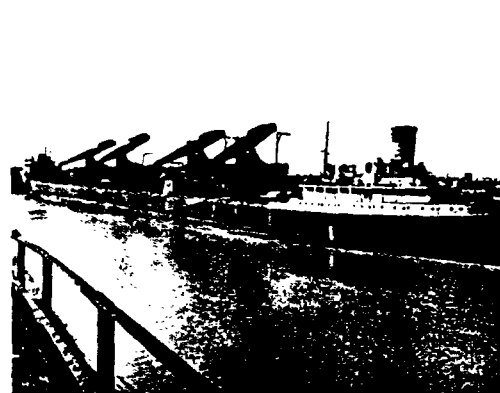
2 Our bulk fleet of seven vessels carries substantial tonnages of ore and coal throughout the Great Lakes area, on a fast turnaround basis. This is the Middletown being unloaded at an ore dock in Toledo.

3 Columbia's seven self-unloaders (this is the Joseph H. Frantz) handle large tonnages of coal, limestone, salt, sand and other commodities. A 256' boom on the Frantz easily stockpiles well back from the water with even distribution.

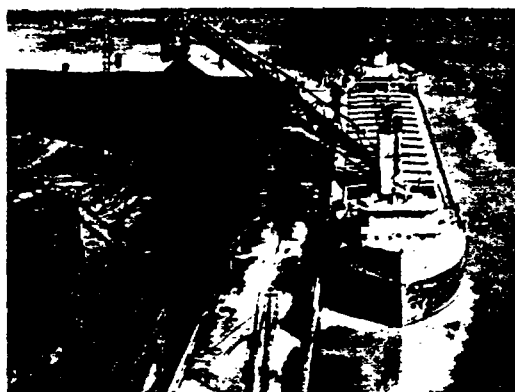
4 Our three crane vessels (this is the W. C. Richardson) are unusually versatile. They move pig iron, scrap, steel, ferro alloys and fabricated steel sections quickly and easily from dockside trains, barges or trucks. Wide hatch openings permit stowage of long lengths and other special cargo.



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2



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BULK VESSELS

VESSEL	Capacity (G.T.)	Over-All Length (Ft.)	Beam (Ft.)	Depth (Ft.)	No. Compartment- ments	No Hatches	Type Engine	Horsepower	Speed*	
									(Miles Per Hour) Light	Loaded
Edmund Fitzgerald	26,600	729	75	39	3	21	Cross Compound Steam Turbine	7500 SHP	17.5	16.7
Middletown	25,500	730	75	39	4	19	Cross Compound Steam Turbine	7700 SHP	18.5	17.5
Armco	20,100	647	70	36	4	19	Cross Compound Steam Turbine	7000 SHP	17.0	16.0
Reserve	20,200	647	70	36	4	19	Cross Compound Steam Turbine	7000 SHP	17.0	16.0
Ashland	16,000	621	60	35	4	18	Triple Expansion	2500 IHP	15.5	13.5
J. Clare Miller	10,900	545	55	31	4	17	Triple Expansion	1760 IHP	11.2	10.7
Howard M. Hanna, Jr.	9,900	524	54	30	4	15	Triple Expansion	1800 IHP	11.2	10.7

*Approximate, actual speed will vary with weather and ballast conditions.

SELF-UNLOADERS

VESSEL	Cargo D. Wt. Capacity (G.T.)	Coal Capacity (N.T.)	Over-All Length (Ft.)	Beam (Ft.)	Depth (Ft.)	No. Compartment- ments	Boom Length (Ft.)	Distance Stem to Boom Rotation Pin (Ft.)	Maximum Boom Rotation
Joseph H. Frantz	13,600	14,800	618	62	32	6	256	181	270°
J. R. Sensibar	11,300	11,200	612	56	31	6	256	154	270°
Crispin Oglebay	10,600	10,200	557	58	31	6	240	86	180°
W. W. Holloway	10,300	10,200	552	56	31	5	240	85	200°
Wyandotte	8,350	6,300	415	56	30	3	218	85	90°
Huron	8,120	6,300	415	56	30	3	150	85	90°
Ben E. Tate	5,700	5,900	376	50	28	4	166	124	200°

VESSEL	Boom Belt Width (Inches)	Boom Belt Speed (Ft. Per Min.)	Unloading† Rate (N.T. Per Hr.)	Tunnel Belt Width (Inches)	Type Engine	Horsepower	Speed*	
							(Miles Per Hour) Light	Loaded
Joseph H. Frantz	60	900	4000	54	Non Reversing Marine Diesel	4000 BHP	15.0	14.0
J. R. Sensibar	60	660	2600	48	Non Reversing Marine Diesel	3200 BHP	15.5	14.5
Crispin Oglebay	60	530	2200	48	Triple Expansion	1878 IHP	13.0	12.0
W. W. Holloway	54	700	3500	42	Non Reversing Marine Diesel	2250 BHP	14.0	13.0
Wyandotte	48	600	1200	42" Buckets	Triple Expansion	1775 IHP	13.5	12.5
Huron	48	600	1200	42" Buckets	Triple Expansion	1775 IHP	13.5	12.5
Ben E. Tate	54	450	1200	Scraper	Triple Expansion	1170 IHP	12.0	11.0

*Approximate, actual speed will vary with weather and ballast conditions.

†The unloading rates are for slack coal.

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CRANE-EQUIPPED VESSELS

VESSEL	Capacity (G. T.)	Over-All Length (Ft.)	Beam (Ft.)	Depth (Ft.)	No. Com- partments	Boom Length (Ft.)
W. C. Richardson	7200	440	52	28	4	75
Buckeye	6800	428	51	28	3	75
O. S. McFarland	5800	380	50	28	3	65

VESSEL	Hatches (Dimension in Ft.)				Type Engine	Horsepower	Speed* (Miles Per Hr.)	
	No. 1	No. 2	No. 3	No. 4			Light	Loaded
W. C. Richardson	52 x 34	64 x 34	64 x 34	58 x 34	Triple Expansion	1467 IHP	12.5	11.5
Buckeye	62 x 32	83 x 32	62 x 32	—	Triple Expansion	1500 IHP	12.0	11.0
O. S. McFarland	48 x 32	78 x 32	48 x 32	—	Triple Expansion	1200 IHP	12.0	11.0

*Approximate, actual speed will vary with weather and ballast conditions.

The Steamer Richardson is equipped with two fast revolving, traveling diesel electric cranes.

The Steamers Buckeye and O. S. McFarland are each equipped with two fast revolving, stationary steam cranes. The cranes on all of these vessels operate interchangeably, 77-inch electro magnets, 3- to 4-yard clam shell buckets, as well as slings and other tackle, thus having flexibility to load and unload cargoes of Pig Iron, Scrap Iron and Steel, Steel, Limestone, Sand, Potash, Ferro Alloys, etc.

CRANE-CONVEYOR VESSEL

VESSEL	Capacity (G.T.)	Over-All Length (Ft.)	Beam (Ft.)	Depth (Ft.)	No. Com- partments	Crane Boom Length (Ft.)	Conveyor Boom Length (Ft.)	Distance Stem To Boom Rotation Pin (Ft.)	Maximum Boom Rotation
Robert C. Norton	8,600	524	54	30	4	85	200	71	110° Port 81° Star.

VESSEL	Boom Belt Width (Inches)	Boom Belt Speed (Ft. Per Min.)	Unloading Rate† (N.T. Per Hr.)	Hatches (Dimensions in Ft.)				Type Engine	Horsepower	Speed* (Miles Per Hour)	
				No. 1	No. 2	No. 3	No. 4			Light	Loaded
Robert C. Norton	42	550	1200	79 x 34	62 x 34	68 x 34	85 x 34	Triple Expansion	1760 IHP	12.5	11.5

*Approximate, actual speed will vary with weather and ballast conditions.

†The unloading rate is for slack coal.

Equipped with two fast revolving, traveling diesel electric cranes and a 200-foot self-unloader boom. Cranes operate interchangeably, 77-inch electro magnets, 9-yard clam shell buckets, as well as slings and other tackle. (Functions equally well as a self-unloader or crane vessel, handling Pig Iron, Scrap Iron and Steel, Coai, Coke, Gravel, Sand, Slag, and other cargoes.)

FE003483

TUG

TUG	Over-All Length (Ft.)	Beam (Ft.)	Depth (Ft.)	Type Engine	Horsepower
S. M. Dean	110	27	13.6	Reversing Marine Diesel	1600 BHP

SELF-UNLOADING BARGE

BARGE	Capacity (N.T.)	Over-All Length (Ft.)	Beam (Ft.)	Depth (Ft.)	No. Com- partments	Boom Length (Ft.)	Maximum Boom Rotation	Boom Belt Width (Inches)	Boom Belt Speed (Ft. Per Min.)	Unloading Rate (N.T. Per Hr.)†
Maida	5,500	375	46	26	3	141	246°	54	600	1,800 Tons

†The unloading rate is for slack coal.

For further information and charter rates:

Phone 861-3300 Monday through Friday*
861-3310 Saturday, Sunday and Holidays*

Whom to contact:

Bulk and Self-Unloader Vessels

Name	Home Telephone Number
L. E. Fisher, Jr.	423-4632
R. F. Kirby	871-7828
A. E. Miller	777-6149
F. A. Castle	449-2216

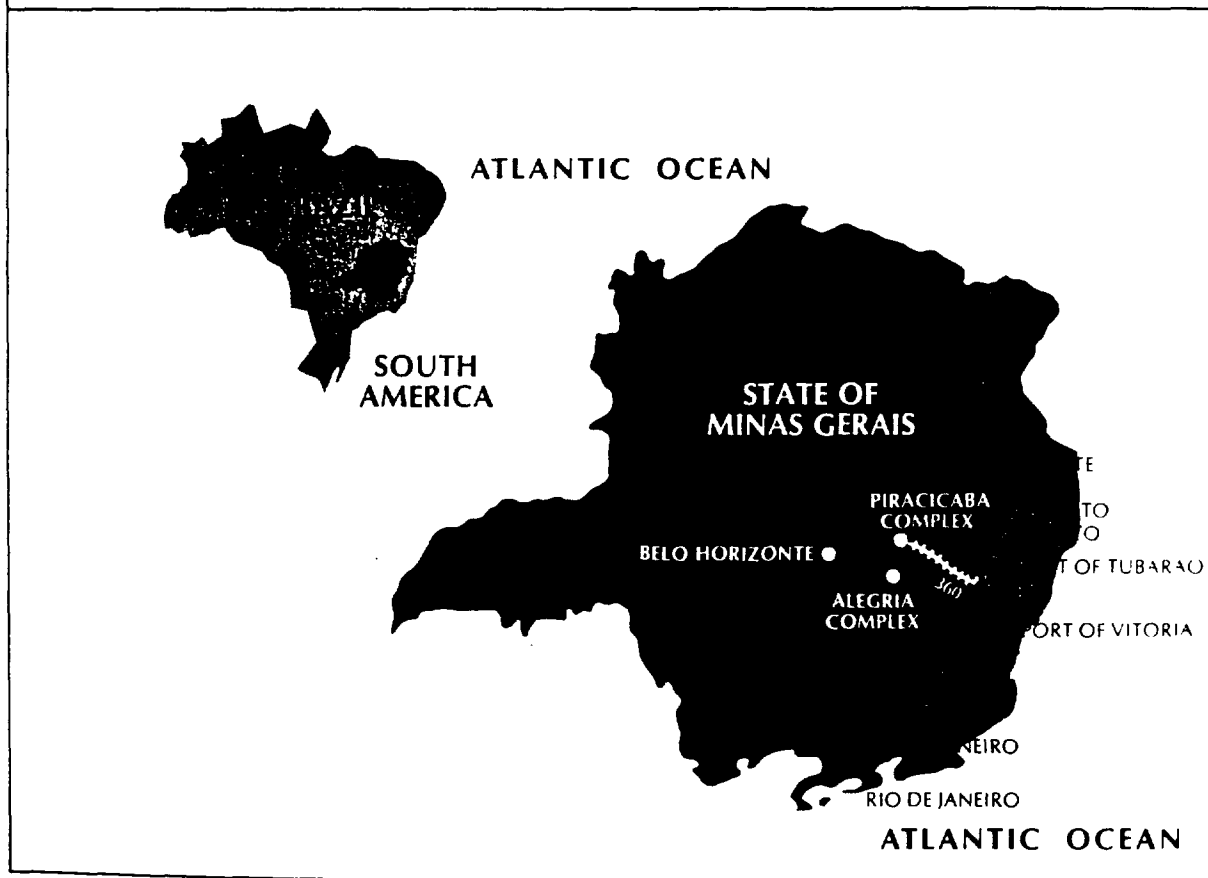
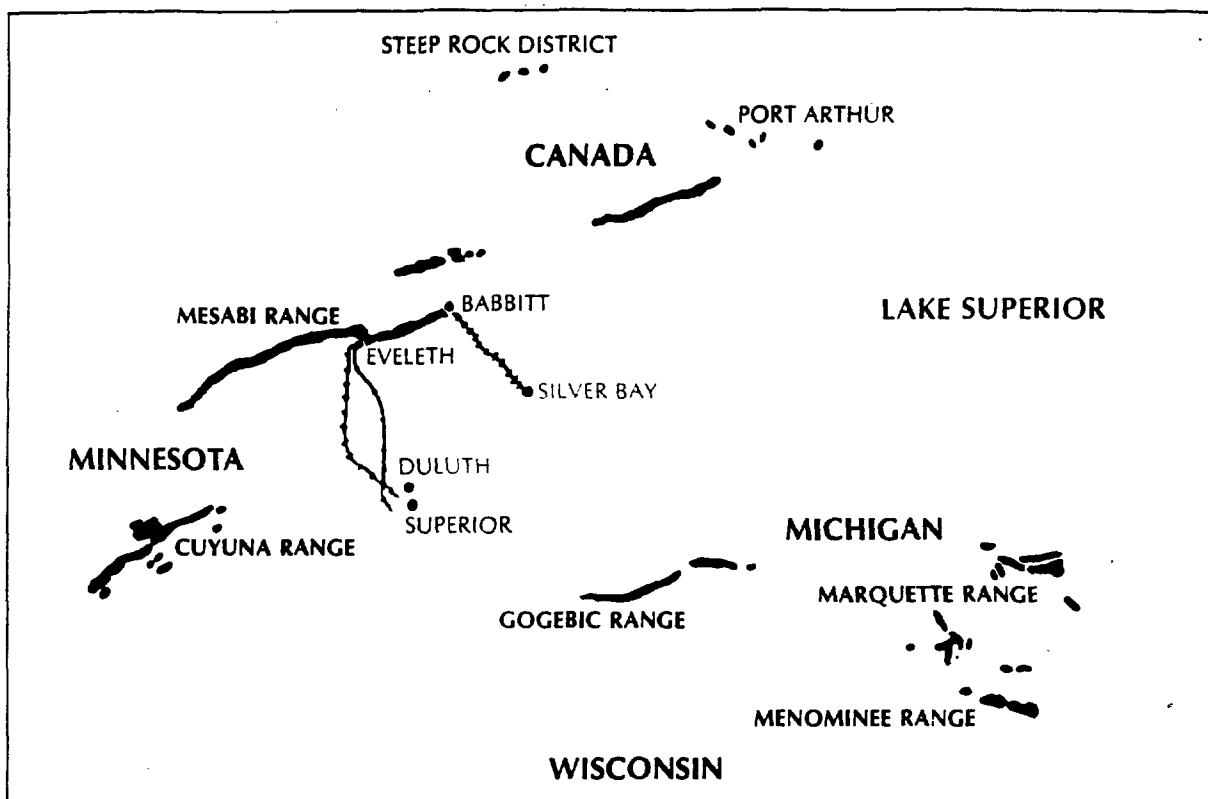
TWX Area Code 216—574-9666

Office Hours: 8:30 A.M. to 5:15 P.M. Monday through Friday
8:30 A.M. to 11:00 A.M. Saturday, Sunday and
Holidays

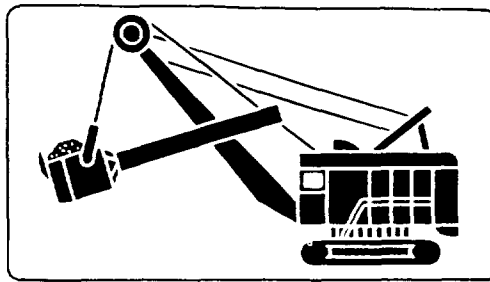
Crane Vessel

Name	Home Telephone Number
J. W. Lamb	371-1330
H. M. Sisunik, Jr.	777-7883

*After office hours, the appropriate dispatcher may be reached by calling his home telephone number.



FE003485



Iron Ore

Oglebay Norton Company has long been associated with the production and sale of high grade Minnesota taconite pellets. This year, as exclusive representative of the Brasamerican Ore Corporation in the United States and Canada, we offer for the first time several grades of Samitri ores mined in the state of Minas Gerais, Brazil.

Eveleth Pellets. Eveleth Taconite Company, managed by Oglebay Norton Company and in which we have a 15% ownership, is now operating at its full design capacity of 1,600,000 gross tons of pellets annually. Oglebay Norton offers for sale its portion of the production of Eveleth Taconite Pellets.

Eveleth Pellets are produced by the Grate-Kiln Process, yielding a premium blast furnace burden in physical uniformity and structure. The pellets are moved in trainload quantities from Fairlane to Duluth for transshipment to lower lakes or to stockpile at a new DM&IR Railroad pellet storage facility. This thirty-acre installation employs the most modern handling equipment, including a rail-mounted boom stacker and bucket wheel reclaimer for moving pellets in and out of storage rapidly.

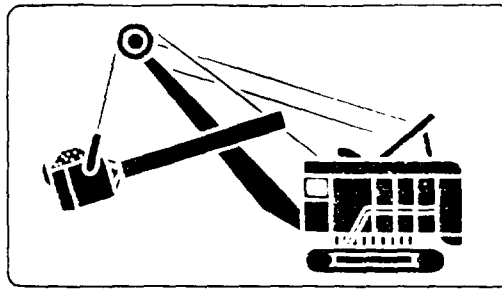
Silver Bay Pellets. Oglebay Norton Company is exclusive sales agent in the United States and Canada for Armco Steel Corporation and Republic Steel Corporation in the sale of Silver Bay Pellets, which offer structural and physical qualities wanted by steel producers.

Silver Bay Pellets are produced at the facilities of Reserve Mining Company, the world's first and largest producer of pellets, which has recently enlarged its facilities to an annual production capacity of about 10.7 million tons. A multimillion-dollar research complex has also been completed in Reserve's program for continued product improvement.

Samitri Ores. Oglebay Norton Company offers Samitri ores in several grades according to size and analysis. The Samitri deposits (located in the state of Minas Gerais, Brazil) have estimated reserves of 245 million tons of direct shipping hematite and over 1 billion tons of easily concentrated itabirite ore. The plant is currently equipped to produce 4 million tons per year.

The deposits are located about 350 miles by rail from the ports of Tubarao and Vitoria. At Tubarao, modern facilities permit loading at a rate of 6,000 tons per hour, with storage capacity for 1 million tons of iron ore. A modern new screening plant is under construction and scheduled to begin operation in April 1967. This will provide improved physical quality by screening prior to loading, rather than at the mine.

Tennessee Sinter. Oglebay Norton Company also sells Tennessee Sinter for use in blast furnaces as well as electric or open hearth furnaces. The fines are also an excellent source of iron oxide for burned dolomite and cement manufacturing.



1. Bucket-wheel reclaimer for loading Taconite pellets at the Lashford Storage Facility, Duluth, Minnesota.

2. Aerial view of the Eveleth Taconite Company facilities, owned jointly with the Ford Motor Company. In addition to managing this significant operation, we offer for sale our portion of production of Eveleth Taconite Pellets.

3. The Morro Agudo Mine's crushing and screening plant in Brazil combines a 300-ton silo with apron feeders, disc separators, conveyors, crushers and a double screening system for efficient classification.

4. Aerial view of Reserve Mining Company's plant at Silver Bay, Minnesota. Oglebay Norton acts as sales agent in the Western Hemisphere, marketing Silver Bay Pellets produced at this installation.

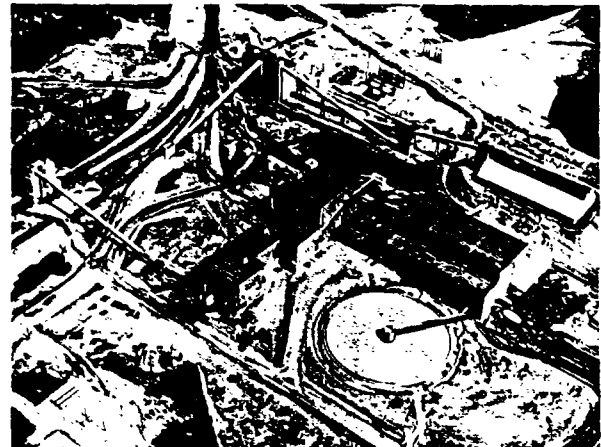
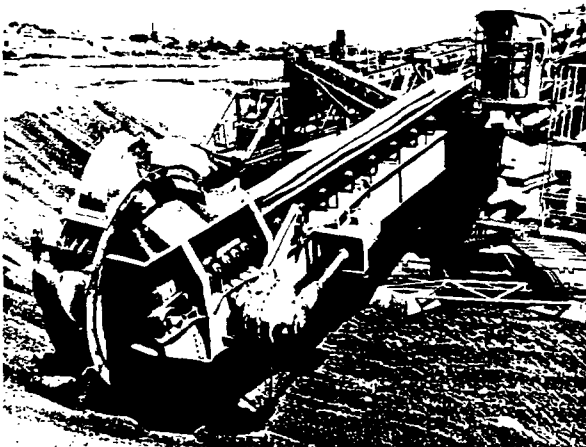


Photo: Courtesy Reserve Mining Company

IRON ORES

Eveleth Taconite Company

Eveleth Taconite Pellets—Mesabi Range

Loading Port: Duluth, Minn.

Expected Analysis 1967	Iron	Phos	Silica	Mang	Alumina	Lime	Magn.	Sul.	Ignition Loss	Moisture
Natural	60.40%	.027	8.25	.30	.46	.46	.45	.003	—	3.5%
Dried At 212°F	62.59%	.028	8.55	.31	.48	.48	.47	.003	—	—

Reserve Mining Company

Silver Bay Pellets—Mesabi Range

Loading Port: Silver Bay, Minn.

Expected Analysis 1967	Iron	Phos	Silica	Mang	Alumina	Lime	Magn.	Sul.	Ignition Loss	Moisture
Natural	63.50%	.013	5.96	.10	.30	.19	.30	.003	—	2.00
Dried At 212°F	64.80%	.013	6.08	.10	.31	.19	.31	.003	—	—

Samitri Iron Ores Through Brasamerican Ore Corporation (All Prices as of Nov. 1966)

Samitri Lump

Expected Analysis 1967	Iron	Phos	Silica	Mang	Alumina	Lime	Magn.	Sul.	Ignition Loss	Moisture
Natural	68.435%	0.02	0.69	0.02	0.54	—	—	—	0.49	0.27
Dried At 212°F	68.62%	0.02	0.69	0.02	0.54	—	—	—	0.49	—

Typical Physical Analysis: (On Loading)

8" to 1/2" = 85%
Below 1/2" = 15%

Price

F.O.B. Vitoria or Tubarao

\$9.10 per gross ton — base 68.5% FE dry, adjustment at \$.1328 per unit.

A.) Moisture in excess of 1% to be deducted from weight.

B.) Penalty of \$.05 per ton per each 1% of 1/2" fines exceeding 15%.

Samitri Pebble

Expected Analysis 1967	Iron	Phos	Silica	Mang	Alumina	Lime	Magn.	Sul.	Ignition Loss	Moisture
Natural	67.982%	0.04	0.50	0.04	0.66	—	—	—	0.65	0.80%
Dried At 212°F	68.53%	0.04	0.50	0.04	0.67	—	—	—	0.66	—

Typical Physical Analysis: (On Loading)

3" to 1/2" = 75%
Below 1/2" = 25%

Price

F.O.B. Vitoria or Tubarao

\$8.25 per gross ton — base 64% FE natural, adjustment at \$.1289 per unit.

A.) Premium or penalty per FE unit above or below 64% FE natural

B.) Premium or penalty of \$.05 per ton for each 1% of fines above or below 25%, up to a maximum of 10%.

Samitri Tubarao-A

Expected Analysis 1967	Iron	Phos	Silica	Mang	Alumina	Lime	Magn.	Sul.	Ignition Loss	Moisture
Natural	67.655%	0.05	0.65	0.04	0.82	—	—	—	0.78	0.93
Dried At 212°F	68.29%	0.05	0.66	0.04	0.83	—	—	—	0.79	—

Typical Physical Analysis: (On Loading)

3" to 1/2" = 65%
Below 1/2" = 35%

Price

F.O.B. Vitoria or Tubarao

\$7.85 per gross ton — base 64% FE natural, adjustment at \$.1227 per unit.

A.) Premium or penalty per FE unit above or below 64% FE natural

Samitri Iron Ore (cont'd)**Samitri Gravel**

Expected Analysis 1967	Iron	Phos.	Silica	Mang.	Alumina	Lime	Magn.	Sul.	Ignition Loss	Moisture
Natural	66.206%	0.04	1.94	0.01	0.87	—	—	—	0.95	1.45
Dried At 212°F	67.18%	0.04	1.97	0.01	0.88	—	—	—	0.96	—

**Typical Physical Analysis
(On Loading)**

3" to ½" = 40%
Below ½" = 60%

Price

\$7.25 per gross ton — base 64% FE natural, adjustment at \$.1133 per unit

A.) Premium or penalty per FE unit above or below 64% FE natural.

F.O.B. Vitoria or Tubarao**Samitri Fines Minus ½ Inch**

Expected Analysis 1967	Iron	Phos.	Silica	Mang.	Alumina	Lime	Magn.	Sul.	Ignition Loss	Moisture
Natural	62.496%	0.06	4.63	0.09	1.17	—	—	—	0.96	3.63
Dried At 212°F	64.85%	0.06	4.80	0.09	1.21	—	—	—	1.00	—

**Typical Physical Analysis:
(On Loading)****Tyler Mesh****Percentage**

on 4	20.62%
on 8	10.60%
on 14	4.42%
on 28	6.16%
on 48	9.00%
on 100	16.46%
on 150	7.60%
on 200	8.60%
on 325	11.50%
thru 325	5.04%

Price

\$5.70 per gross ton — base 64% FE natural, adjustment at \$.0891 per unit.

F.O.B. Vitoria or Tubarao**Assay**

The chemical analysis, as determined by a mutually acceptable independent chemist at the port of discharge, shall govern and be the basis for final settlement.

The physical analysis, as determined by a mutually acceptable independent assayer at the port of loading, shall govern and be the basis for final settlement.

Chemical Analysis Trace Elements

Titanium	0.10%
Calcium	less than 0.05%
Magnesium	less than 0.05%
Sulphur	less than 0.01%
Copper	less than 0.001%
Nickel	less than 0.001%
Chromium	less than 0.001%
Cobalt	less than 0.001%
Vanadium	0.005%
Lead	less than 0.001%
Zinc	less than 0.001%
Antimony	less than 0.001%
Molybdenum	less than 0.001%
Sodium	Traces
Potassium	Traces
Arsenic	Traces
Tin	Traces

Weighing

A. Weighing for invoicing purposes shall take place at destination port, provided adequate and officially recognized scales are available at discharging huddes. Weighing after unloading to stockpile by railroad scales is not acceptable.

B. If, for any circumstances, weighing cannot be performed as expressed in Item A, the buyer accepts the bill of lading weight for invoicing purposes.

In case of weight determination in the form expressed in Item A, the weighing certificate should be submitted to the seller at latest 60 days after discharge.

Payments

Payments are to be made in United States dollars for 90% of the total value upon presentation of clean ocean bill of lading. The balance is due upon presentation of assay certificate.

Tennessee Corporation**Sinter****F.O.B. Copperhill, Tenn.**

Expected Analysis 1967	Iron	Phos.	Silica	Mang.	Alumina	Lime	Magn.	Sul.	Ignition Loss	Moisture
Dried At 212°F	69.00%	.004	1.40	.05	.40	.70	50	07	—	—

BASE PRICES

Lake Superior Iron Ores

51.50% Iron Natural

f.o.b. Rail of Vessel Lower Lake Ports

OLD RANGE					MESABI				
Year	Bessemer	Non-Bessemer	Bessemer	Non-Bessemer	Year	Bessemer	Non-Bessemer	Bessemer	Non-Bessemer
1940-1944	\$ 4.75	\$ 4.60	\$ 4.60	\$ 4.45	1952	\$ 9.45	\$ 9.30	\$ 9.20	\$ 9.05
1945	4.95	4.80	4.70	4.55	1953	10.10	9.95	9.85	9.70
1946	5.45	5.30	5.20	5.05	1954	10.30	10.15	10.05	9.90
1947	5.95	5.80	5.70	5.55	1955	10.30	10.15	10.05	9.90
1948	6.60	6.45	6.35	6.20	1956	10.40	10.25	10.25	10.10
1949	7.60	7.45	7.35	7.20	1957-1961	11.25	11.10	11.00	10.85
1950	8.10	7.95	7.85	7.70	1962-1965	11.85	11.70	11.60	11.45
1951	8.70	8.55	8.45	8.30		11.05	10.90	10.80	10.65

1966

OLD RANGE		MESABI	
Bessemer	\$10.95	Bessemer	\$10.70
Non-Bessemer	10.80	Non-Bessemer	10.55
Coarse Ore		\$.80 premium	
Fines		45 allowance	

Other Classifications:

Open Hearth Lump \$12.60 - 13.15

High Phos. 10.55

Iron Ore Pellets .252 per natural iron unit

LAKE SUPERIOR IRON ORE RATES

Cost per gross ton for transporting iron ore from point of origin to point of consumption.

Rates in effect 1966 (including X-223)

Range	Loading Port	Rail Rate	Car to Hold of Vessel	Vessel Movement	Vessel Rate	Point of Consumption	Single-Car Line Haul Rate
Cuyuna	Duluth, Superior	1.28	.19	Lower Lake Ports	1.90	LAKE ERIE PORTS TO: Valleys District, Canton & Massillon Midland, Steubenville, Weirton & Neville Island Pittsburgh and Wheeling Districts	\$2.08*****
Mesabi	Duluth, Superior						
Vermilion	Two Harbors						
Gogebic	Ashland	.82* 1.25	.19	Lake Erie Ports Lake Mich. Ports	1.43 1.14	Monessen, Pa. Johnstown, Pa. Virginia District	2.39***** 2.73***** 2.86***** 3.02***** 4.04
	Escanaba	1.37* 2.00					
Steep Rock	Port Arthur	1.74** (Can.)	.23 (Can.)	Lower Lake Ports	1.78 1/8	TOLEDO TO: Jackson, Hamilton & Middletown, Ohio	2.24*****
Eastern Marquette	Marquette	.60*	.17***	Lower Lake Ports	1.71	Ashland, Ky. and Portsmouth, Ohio	2.93*****
Western Marquette		.69*					
Marquette	Escanaba	1.25*****	.19*****	Lake Erie Ports	1.43	CLEVELAND TO: Jackson, Ohio Ashland, Ky., Hamilton and Portsmouth, Ohio	2.68*****
Menominee				Lake Mich. Ports	1.14	CHICAGO TO: Granite City, Ill.	2.93***** 2.63

Dock Handling Charges—At Lower Lake Ports

(A) Hold to Rail of Vessel	\$0.28
(B) Rail of Vessel to Stockpile	.49
(C) Stockpile to Car	.31
(D) Storage per Month	.01 1/4
(E) Rail of Vessel to Car	.22

- *Restricted
- **Maximum Rate
- ***Pellet handling charge \$0.12
- ****Groveland Mine to Escanaba pellet line haul \$ 92.
- Pellet dumping \$0.12.
- *****Multiple Car Rate Reduction of \$.20 G.T. on 10,000 G. T. T.

ALL-RAIL FREIGHT RATES TO CONSUMING DISTRICTS

Rates in effect as of January 1, 1967

From Mesabi and Vermilion Ranges To: (X-223 Level)

Valleys District	\$ 9.78
Cleveland, Lorain, Canton and Massillon	9.78
Pittsburgh and Wheeling District	10.23
Johnstown, Pa.	10.46
Midland, Pa.	8.01*****
Chicago, Ill.	4.00***

From Gogebic To

Granite City, Ill.	\$ 3.50**
East St. Louis, Ill.	4.00*

From Negaunee, Mich., To:

Hamilton and Welland, Ont., Canada	7.65
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From Marquette Range To

Detroit, Mich.	3.65****
Mingo Jct., Ohio	6.02****

From Negaunee, Mich., To:

Sault Ste. Marie, Ont., Canada	3.55
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From Cuyuna, Mesabi, and Vermilion Ranges To:

Duluth, Minn.	1.47
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From Cuyuna, Marquette, and Menominee Ranges To

Granite City and East St. Louis, Ill.	4.00*
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From Marquette, Gogebic, and Menominee Ranges To:

Cleveland, Lorain, Valleys District,	
Canton and Massillon	7.68
Pittsburgh District	8.33
Weirton and Wheeling District	8.02
Johnstown, Pa.	8.58
Chicago District	4.00*

From Fillmore County, Minn., To:

Chicago District	2.81*
Granite City	3.00**

*Rate applicable only in lots of 20 or more cars on one B/L, single car rate is higher.

**Rate applicable only in lots of 40 or more cars on one B/L, based on annual tonnage.

***Rate applicable only in lots of 6,000 ton minimum shipments, based on annual tonnage.

****Rate applicable only in lots of 30 or more cars on one B/L, single car rate is higher.

*****Rate applicable only in lots of 6,000 ton minimum shipments from Eagle Mills and Republic Mines, Mich.

*****Rate applicable only in lots of 6,000 ton minimum shipments.

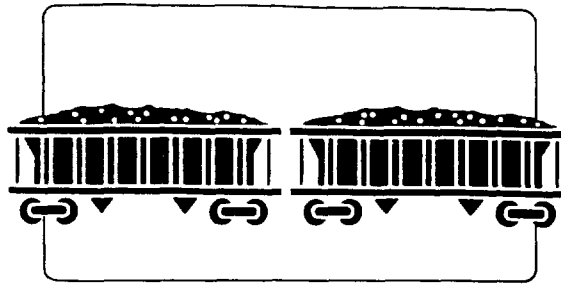
Canadian—freight rates

From Wawa, Ont., to Michipicoten, Ont. (Combined rail and dock charge)	\$0.70
From Michipicoten Range to Sault Ste. Marie, Ont.	\$2.19

IMPORTED IRON ORE—FREIGHT RATES

Rates in effect as of January 1, 1967

	FROM:				
	Baltimore, Maryland	Philadelphia, Pennsylvania	Hampton Roads, Virginia	Fairless, Pennsylvania	Gulf Ports
Bethlehem, Pa.	\$2.86	\$1.99			
Birmingham District					\$2.13 N/T
Buffalo, N. Y.	4.03	4.03			
Chicago District	6.40	6.40	\$6.40	\$6.40	6.40
Cleveland, Ohio	4.30	4.30	6.01		
Detroit District	5.11	5.11	5.11		
Donora, Pa.	3.62	3.62		3.62	
Fairless, Pa.	2.86	1.76			
Johnstown, Pa.	3.50	3.50		3.50	
Lone Star, Tex.					3.75
Lyle, Tenn.					4.03
Middletown, O.	4.52	4.52	4.52		
Minnequa, Colo.					6.40
Pittsburgh District	3.76	3.76	5.77	3.76	
Rockwood, Tenn.					4.03
Sault Ste. Marie, Ont.	8.85	8.85	8.48		
Sparrows Point, Md.	1.74	2.85			
Weirton & Wheeling, W. Va.	3.96	3.96			
Youngstown District	4.03	4.03	6.01	4.03	



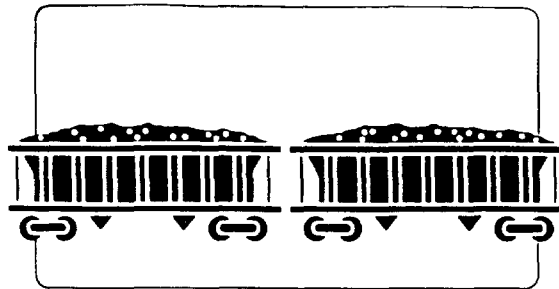
Coal

Our program of continuous modernization, both above and below ground, has continued at a rapid pace during the past year. New storage and loading facilities have been installed at our Norton Mine in Ohio, and we are now in full production on a unit train basis. Coal is processed at the preparation plant and goes by covered belt conveyor to five large concrete silos, which have a total storage capacity in excess of 11,000 tons. From these silos the coal is conveyed as needed directly to a 100-ton surge bin for loading into railroad cars at a rate of 10,000 tons in a four-hour period. The coal from our Norton Mine, as well as Saginaw Mine, is marketed primarily to utilities and industry. In addition to the Norton Mine, all the mines operated by Oglebay Norton Company are equipped to load volume shipments.

At our mines in southern West Virginia located in Raleigh, Boone and Kanawha Counties on the Chesapeake & Ohio Railroad, we produce high grade metallurgical coals which are marketed under the trade name of Shamrock. Our Brule Mine (Pocahontas #3) is located in Wyoming County on the Norfolk & Western Railroad. This is also high grade metallurgical coal and is sold exclusively for this purpose.

Oglebay Norton Company mines are shipping coal regularly to 19 states and Canada, as well as exporting to numerous foreign countries. Our total reserves are in excess of 300 million tons, and we are constantly exploring and seeking new reserves. In addition, we are the exclusive sales agent for a number of other large producers in Ohio, Southeastern Kentucky and West Virginia.

Our facilities are flexible, and our modern techniques in mining, in preparation, storage and loading plants, plus highly qualified personnel, guarantee quality coals to our customers.

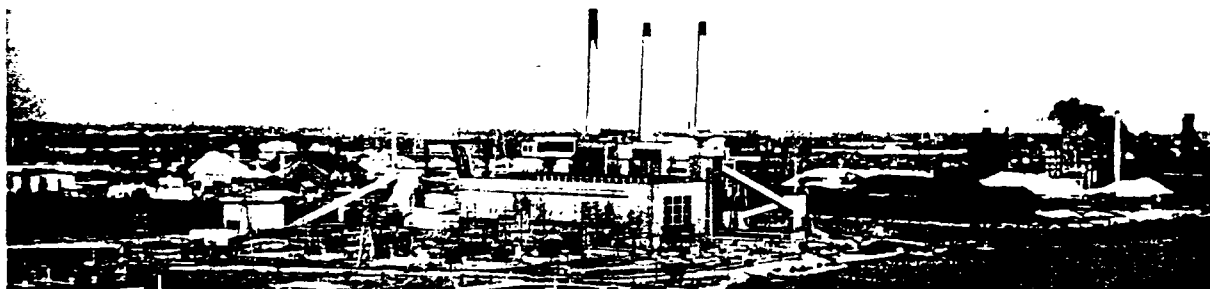
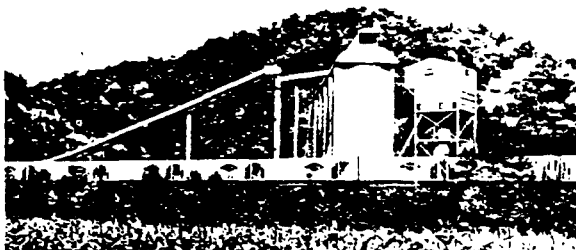
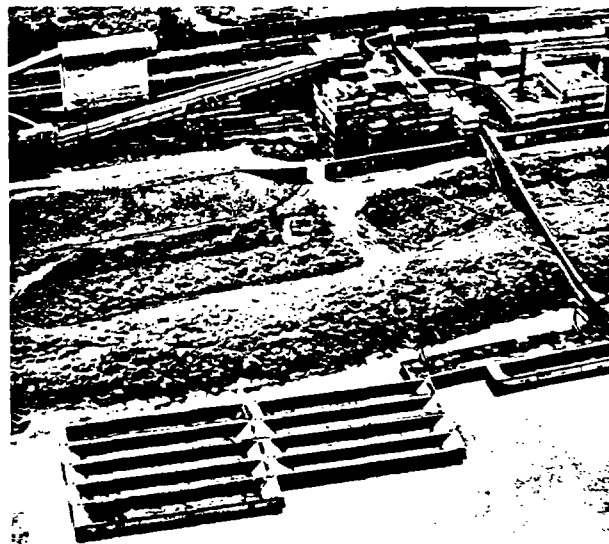


1. Our Fuel Engineering Department is available at all times to assist customers in obtaining maximum efficiency in coal burning operations. Pictured here is Mr. Herbert R. Lambers, our Manager, Fuel Engineering Department, along with Mr. E. V. Riedor, Superintendent of the River Rouge Station of Detroit Edison Company.

2. The Norton Mine's new unit train loadout facility. Train shovels carries 10,000 tons per trainload. Approximate loading time: 4 hours.

3. One of the two modern centralized preparation plants located on the Ohio River. It ships processed coal by barge to customer specifications. The plant is located at Kayford, West Virginia, on the Kanawha River.

4. Detroit Edison's River Rouge Station, a large user of Ogdenia No. 10 coals.



OHIO NO. 8 SEAM

domestic and steam coal

Name of Mine Norton No. 3 (Deep) Railroad P. R. R.
Shipping Point Onco, Ohio County Belmont
District No. 4 Daily Production 5 000 N.T.
Seam Pittsburgh, Ohio No. 8

Preparation Equipment Davis Heavy Media Washery, Stoker Dryer and Slack Dryer, Crusher, Vibrator
and Shaker Screens, Storage Bins, Loading Facilities, Loading Booms, Freeze Proofing, Oil Treating
Operating Company Oglebay Norton Company

Proximate Analysis:	Moisture	Volatile	Fixed Carbon	Ash	Sulphur	B.T.U. As Received	B.T.U. Dry	Fusion	Grind-ability	Coke Button
5" x 2" Egg	3.77	39.92	49.11	7.20	3.65	13,165	13,615	2,230	57	5
2" x 1 1/4" Nut	3.67	38.92	50.18	7.23	3.52	13,165	13,595	2,215	57	5
1 1/4" x 3/8"										
3/4" x 3/8" Stoker	3.60	39.52	49.33	7.55	3.72	13,125	13,515	2,205	57	5
1" x 3/8"										
3/4" x 3/8" Mod. Stoker	3.65	39.30	49.34	7.71	3.67	13,025	13,485	2,190	57	5
3/8" x 0" Slack	4.00	39.85	45.48	10.67	3.83	12,515	13,215	2,170	57	5

All 2", 1 1/4", 1", 3/4" nut and slack can be modified to suit problems of various burning equipment installations.

OHIO NO. 8 SEAM

domestic and steam coal

Name of Mine Saginaw (Deep) Railroad N. & W.
Shipping Point St. Clairsville, Ohio County Belmont
District No. 4 Daily Production 4,000 N.T.
Seam Pittsburgh, Ohio No. 8

Preparation Equipment Davis Heavy Media Washery, Stoker Dryer and Slack Dryer, Crusher, Vibrator
and Shaker Screens, Loading Booms, Freeze Proofing, Oil Treating
Operating Company Oglebay Norton Company

Proximate Analysis:	Moisture	Volatile	Fixed Carbon	Ash	Sulphur	B.T.U. As Received	B.T.U. Dry	Fusion	Grind-ability	Coke Button
5" x 2" Egg	3.77	39.02	50.01	7.20	3.57	13,150	13,610	2,210	57	5 1/2
2" x 1 1/4" Nut	3.66	38.96	50.15	7.23	3.46	13,160	13,590	2,205	57	5 1/2
1 1/4" x 3/8"										
3/4" x 3/8" Stoker	3.62	39.50	49.33	7.55	3.82	13,150	13,510	2,180	57	5 1/2
1 1/4" x 3/8"										
1" x 3/8" Mod. Stoker	3.79	38.30	50.30	7.61	3.76	13,010	13,455	2,170	57	5 1/2
3/8" x 0" Slack	4.15	40.00	45.38	10.47	3.83	12,450	13,242	2,110	57	5 1/2

All 2", 1 1/4", 1", 3/4" nut and slack can be modified to suit problems of various burning equipment installations.

OHIO NO. 8 & 9 SEAMS

steam coal

Name of Mine Carol No. 3 (Strip) Railroad B & O
Shipping Point Salesville, Ohio County Guernsey
District No. 4 Daily Production 1,500 N.T.
Seam Ohio No. 8 & 9

Preparation Equipment Picking Table, Crusher
Operating Company R. & F. Coal Company

Proximate Analysis:	Moisture	Volatile	Fixed Carbon	Ash	Sulphur	B.T.U. As Received	B.T.U. Dry	Fusion	Grind-ability	Coke Button
Mine Run	5.15	37.82	47.10	9.93	2.96	12,075	12,865	2,325	53	4 1/2
2" Crushed	5.15	37.82	47.10	9.93	2.96	12,075	12,865	2,325	53	4 1/2
1 1/4" Crushed	5.15	37.82	47.10	9.93	2.96	12,075	12,865	2,325	53	4 1/2

OHIO NO. 8 & 9 SEAMS (cont'd)

steam coal

Name of Mine Rice No. 2 (Strip) Railroad B. & O.
Shipping Point Speidel, Ohio County Belmont
District No. 4 Daily Production 2,000 N.T.
Seam Ohio No. 8 & 9

Preparation Equipment Picking Table, Crusher
Operating Company R. & F. Coal Company

Proximate Analysis:	Moisture	Volatile	Fixed Carbon	Ash	Sulphur	B.T.U. As Received	B.T.U. Dry	Fusion	Grind-ability	Coke Button
Mine Run	5.15	37.82	47.10	9.93	2.96	12,380	13,185	2,325	53	4½
2" Crushed	5.15	37.82	47.10	9.93	2.96	12,380	13,185	2,325	53	4½
1¼" Crushed	5.15	37.82	47.10	9.93	2.96	12,380	13,185	2,325	53	4½

OHIO NO. 9 SEAM

steam coal

Name of Mine Rice No. 1 (Strip) Railroad B. & O.
Shipping Point Flushing, Ohio County Belmont
District No. 4 Daily Production 2,000 N.T.
Seam Ohio No. 9

Preparation Equipment Picking Table, Crusher
Operating Company R. & F. Coal Company

Proximate Analysis:	Moisture	Volatile	Fixed Carbon	Ash	Sulphur	B.T.U. As Received	B.T.U. Dry	Fusion	Grind-ability	Coke Button
Mine Run	5.15	37.82	47.10	9.93	2.96	12,380	13,185	2,325	53	4½
2" Crushed	5.15	37.82	47.10	9.93	2.96	12,380	13,185	2,325	53	4½
1¼" Crushed	5.15	37.82	47.10	9.93	2.96	12,380	13,185	2,325	53	4½

POCAHONTAS NO. 3 SEAM

low volatile—by-product coal

Name of Mine Brule (Deep) Railroad N. & W.
Shipping Point Otsego, West Virginia County Wyoming
District No. 7 Daily Production 2,200 N.T.
Seam Pocahontas

Preparation Equipment Belknap Washery, Vibrator and Shaker Screens, Thermal Coal Dryers,
Loading Booms, Deister Tables
Operating Company Oglebay Norton Company

Proximate Analysis:	Moisture	Volatile	Fixed Carbon	Ash	Sulphur	B.T.U. As Received	B.T.U. Dry	Fusion	Grind-ability	Coke Button
Slack	3.03	17.24	74.08	5.65	.62	14,289	14,812	2,800	103	9

Brule-Pocahontas is well known as a superior quality coal, excellent for by-product and metallurgical application. Ample reserves assure a constant supply for many years.

SHAMROCK METALLURGICAL COALS

Shamrock is produced from our large West Virginia mines located in Raleigh, Boone and Kanawha Counties.

Shamrock Metallurgical Coals are high volatile coals with low ash and low sulphur content. Fluidity and contraction are excellent.

All Shamrock Coals are processed through the Shamrock and Ceredo preparation plants. Modern preparation equipment and methods assure uniform quality of Shamrock Coals. We are always researching to improve the quality of Shamrock Metallurgical Coals, including constant Petrographic studies.

DOMESTIC COALS

Oglebay Norton and its wholly owned subsidiary, the Cabin Creek Coal Sales Company, offer a broad line of top quality domestic coals. These coals have a high b.t.u. and a low sulphur and ash content.

Domestic coals include Blue Star, Blue Crescent, Blue Beacon, Saginaw and Norton. In addition to these coals, we are exclusive sales agent for Star Sapphire, Hi-Lo and Black Gold domestic coals.

LAKE FORWARDING

This service is offered by Oglebay Norton to Great Lakes coal users. It includes complete traffic management from mine to your plant or waterside distribution point. Mine shipments via rail are scheduled to Great Lakes loading facilities. Cars are marshalled quickly, and accurately timed to meet vessel availability. Deliveries to your destinations are prompt.

PREPARATION PLANTS

Name of Plant	Ceredo Central Cleaning Plant
Shipment	C&O Rwy., N&W RR. and Ohio River
Location	Ceredo, Wayne Co., W. Va.
Designer of Plant	McNally-Pgh. Mfg. Co.
Washing Equipment	McNally Norton Jigs & Rheo.
Drying Equipment	C.M.I. Centrifugal and McNally— Pulso Thermal
Daily Cap. Cleaned Coal	10,000 Tons
Type Dust Treatment	Oil Spray
Sizes Washed	All Sizes and Fines

Name of Plant	Shamrock No. 1 Preparation Plant
Shipment	C&O Rwy. and Kanawha River
Location	Kayford, Kanawha Co., W. Va.
Designer of Plant	McNally-Pgh. Mfg. Co.
Washing Equipment	McNally Norton Jigs & Rheo.
Drying Equipment	C.M.I. Centrifugal Driers
Daily Cap. Cleaned Coal	7,000 Tons
Type Dust Treatment	Oil Spray
Sizes Washed	All Sizes and Fines

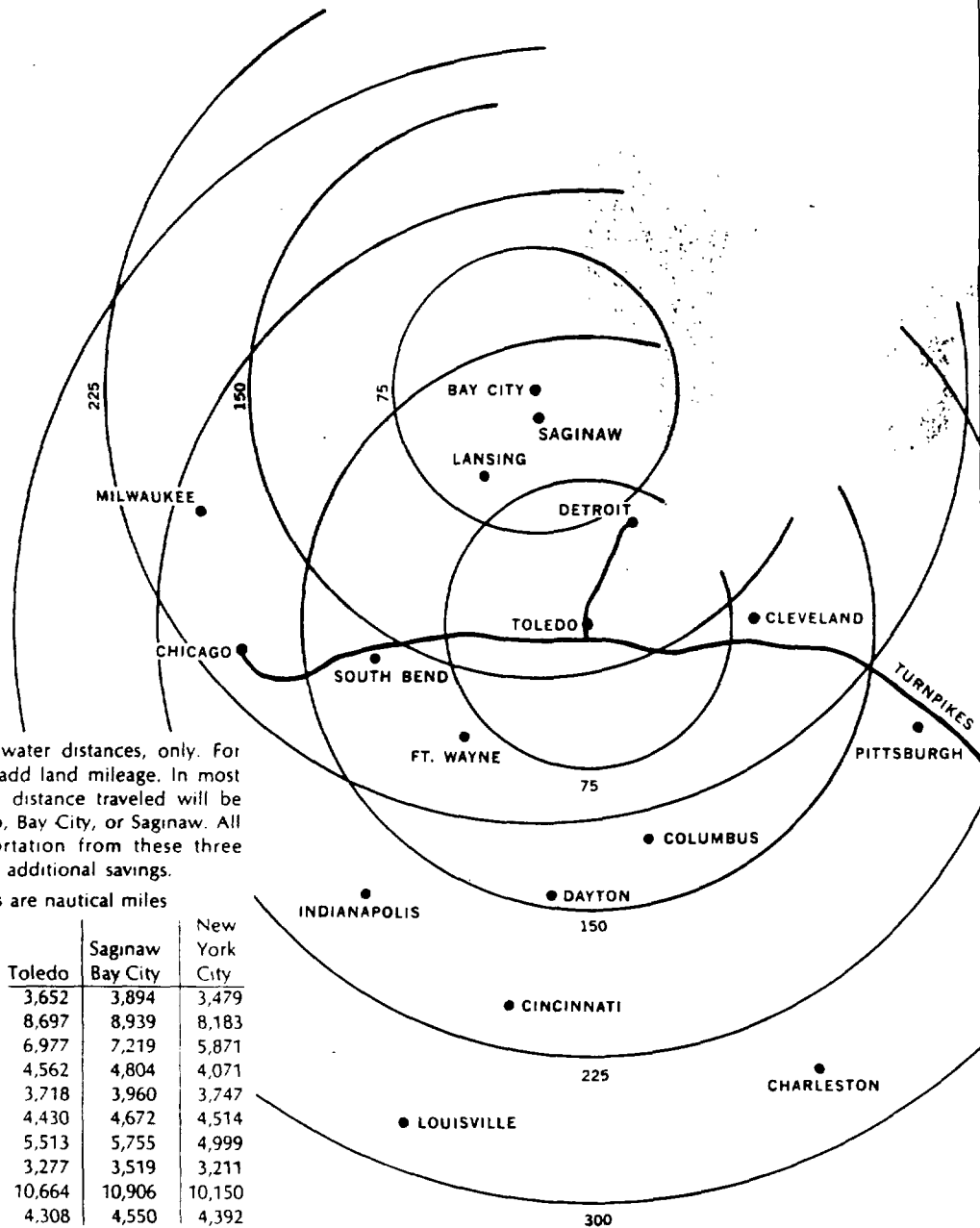
DISTANCE TO PRINCIPAL PORTS

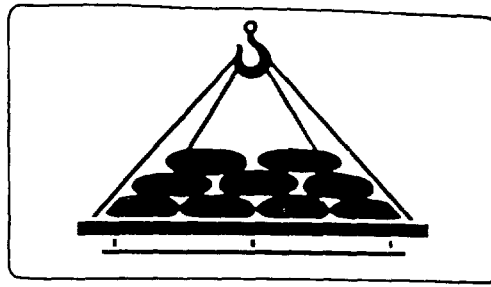
These are all water distances, only. For total distance add land mileage. In most cases the total distance traveled will be less via Toledo, Bay City, or Saginaw. All water transportation from these three ports provides additional savings.

Figures are nautical miles

	Toledo	Saginaw Bay City	New York City
Antwerp	3,652	3,894	3,479
Bombay	8,697	8,939	8,183
Buenos Aires	6,977	7,219	5,871
Genoa	4,562	4,804	4,071
Hamburg	3,718	3,960	3,747
Helsinki	4,430	4,672	4,514
Istanbul	5,513	5,755	4,999
Liverpool	3,277	3,519	3,211
Singapore	10,664	10,906	10,150
Stockholm	4,308	4,550	4,392

Source: U. S. Navy Hydrographic Office.





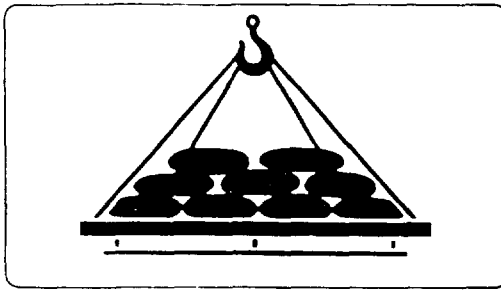
Docks

Efficient and dependable cargo handling by experienced and skilled personnel is the trademark of Oglebay Norton Company dock services. Our operations are located at Toledo, Ohio, Bay City and Saginaw, Michigan. We are also a part owner of the Western Navigation Company with its dock at South Chicago, Illinois, which serves as a key transfer point between the Mississippi, the Great Lakes and the St. Lawrence Seaway.

The Toledo Overseas Terminals Co. has recently completed an expansion of its cargo handling and storage facilities. It is equipped to handle all types of bulk and general cargoes and adjoins the only Foreign Free Trade Zone on the Great Lakes. The dock has four ship berths, 115,000 square feet of transit shed space, one 110-ton capacity gantry crane, two 25-ton capacity gantry cranes and numerous other customer service items. Double railroad tracks on the dock apron reduce loading and unloading time. This dock, located at the entrance of Toledo Harbor, below all bridges and power lines, offers berthing without tugs.

Our Bay City Seaway terminal, located at the mouth of the Saginaw River in Bay City, Michigan, is equipped with modern dock, warehouse and terminal facilities for handling and moving general and bulk cargoes, with 40,000 square feet of covered storage capacity.

The Saginaw dock, which has long served the automobile industry in Central Michigan, has cargo handling and terminal facilities for handling raw and finished materials, with 24 acres of storage capacity for bulk commodities.



1 Bay City Seaway Terminal. Located at the mouth of the Saginaw River, this facility consists of three modern warehouses. It serves the Orient, Europe, South America and Mediterranean countries.

2 The facilities of Toledo Overseas Terminals have been substantially expanded to expedite increased traffic in a variety of commodities including machinery, automobiles, foodstuffs, finished and semi-finished goods.

3 View of the Saginaw Dock. This facility offers open and covered storage space and is equipped with three diesel cranes.

4 Western Navigation at South Chicago has 25 acres of open storage located on the Calumet River. A dockside steel and concrete transit building provides excellent covered storage. River barges, lake vessels, and rail cars are serviced.



1



2



3



4

DOCK OFFICE

WAREHOUSE No. 1

TRUCK DRIVEWAY BLACKTOP

TRUCK DOCK

BLACKTOP YARD

WAREHOUSE No. 2

BLACKTOP YARD

BLACKTOP APRON

TRUCK & RAIL DOCK

WAREHOUSE No. 3

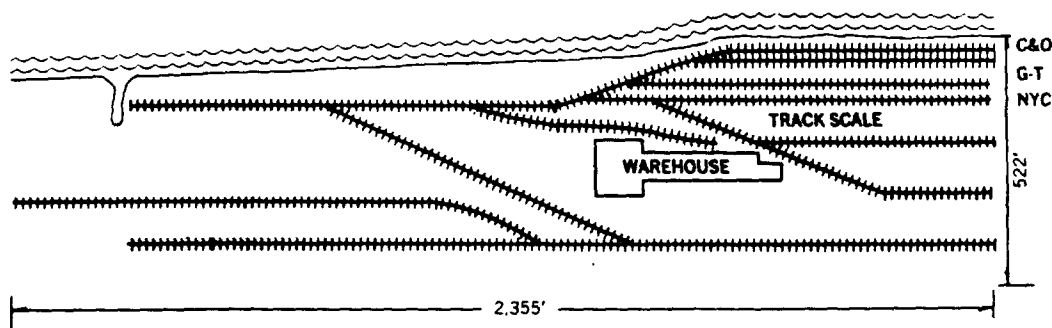
MATERIAL YARD STONE

D.M. & C.O. & N.Y.C. R.R.

100' 00'

DATA

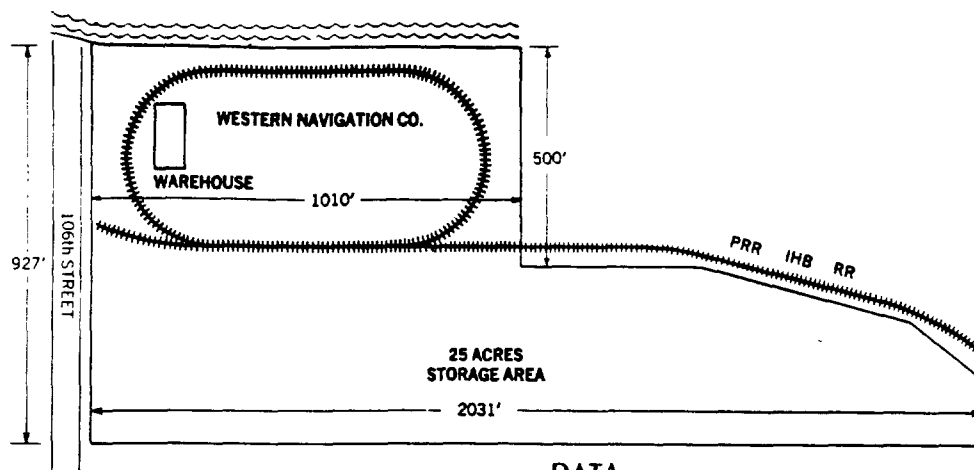
SAGINAW DOCK



DATA

Dock Length	2,355 ft.
Depth alongside dock	22 ft.
Steel Bulk Heading	550 ft.
Number of Warehouses	1
Open Storage	24 acres
Railroads	C&O, GTW, NYC
Dock Surface	Gravel
Telephone	755-0495
Mailing Address	P.O. Box 1471
	Saginaw, Michigan 48606
Contact Dock Traffic Manager for rates and other information.	

WESTERN NAVIGATION COMPANY



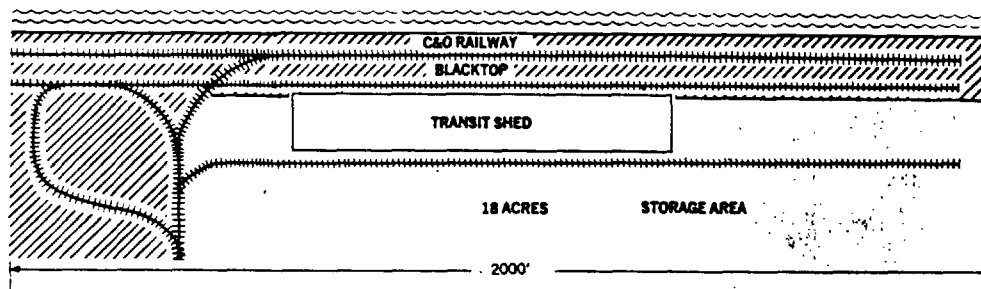
Located 3 miles from Lake Michigan on the Calumet River in South Chicago, with water connections to the Mississippi via Cal-Sag Canal. Available as a transfer point for river barges and vessels, and terminal for Chicago area. It is equipped to handle all types of bulk cargoes such as: Coal, iron ore, sulphur, scrap, and pig iron. The dock is jointly owned by Oglebay Norton Co. along with two other companies.

DATA

Number of Warehouses1
 Covered Storage11,200 sq. ft.
 Open Storage25 acres
 RailroadsP.R.R., I.H.B.
 Steel Bulk Heading1,000 ft.
 Dock SurfaceSlag
 Telephone321-0150
 Mailing Address1 E. Wacker Dr.
 Chicago, Ill. 60601

Contact Dock Operations Manager for rates and other information.

TOLEDO OVERSEAS TERMINALS



Located on Lake Erie at the mouth of the Maumee River, below all bridges, at Toledo. The dock is adjacent to Interstate Routes 75 and 280, a super highway connecting Detroit, Toledo and the Ohio Turnpike. The dock is equipped with heavy lift cranes to handle sea-way import and export package and bulk cargo, and lake bulk cargoes. Direct connections to nine mainline railroads are available through C & O switching facilities in Toledo.

DATA

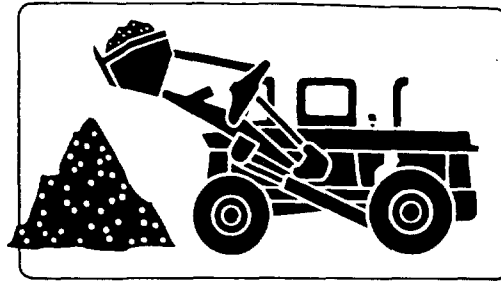
Dock Length, Steel Bulk Heading2,000 ft.
 Depth alongside dock27 ft.
 Traveling heavy lift crane110-ton capacity
 Two Traveling Gantries25-ton capacity
 Covered Storage115,000 sq. ft.
 Open Storage18 acres
 RailroadC & O
 Dock SurfaceBlacktop
 Telephone726-2605
 Mailing AddressStation "A", Box 306
 Presque Isle

Cable: TOTCO

Toledo, Ohio 43605

Contact Terminal Superintendent in Toledo for schedules, rates and other information.

FE003501



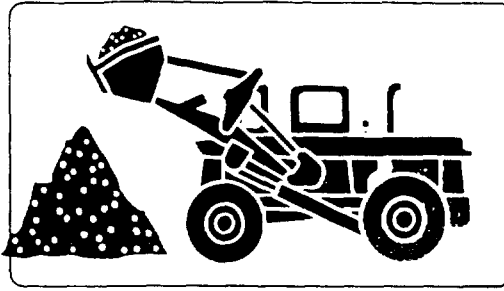
Raw Materials

Oglebay Norton serves the steel, foundry, chemical, ceramic and glass industries as a reliable supplier of an extensive list of basic raw materials. We enjoy quality-conscious and dependable relationships with our producers of these materials. Sales can be made on a spot basis or under long-term contracts to meet customer needs.

Our products include ONMEX Metallurgical Fluorspar; Minerva Fluorspar Pellets, produced by The Minerva Company, Eldorado, Illinois; ONCO Ceramic Fluorspar, a product of Reynolds Mining, Eagle Pass, Texas; New Jersey Zinc Company's Spiegeleisen; Celestite; Rim-Blox, a degasifying ingot mold addition for rimmed steels; Ferro-Phosphorus; and Lump Phosphate.

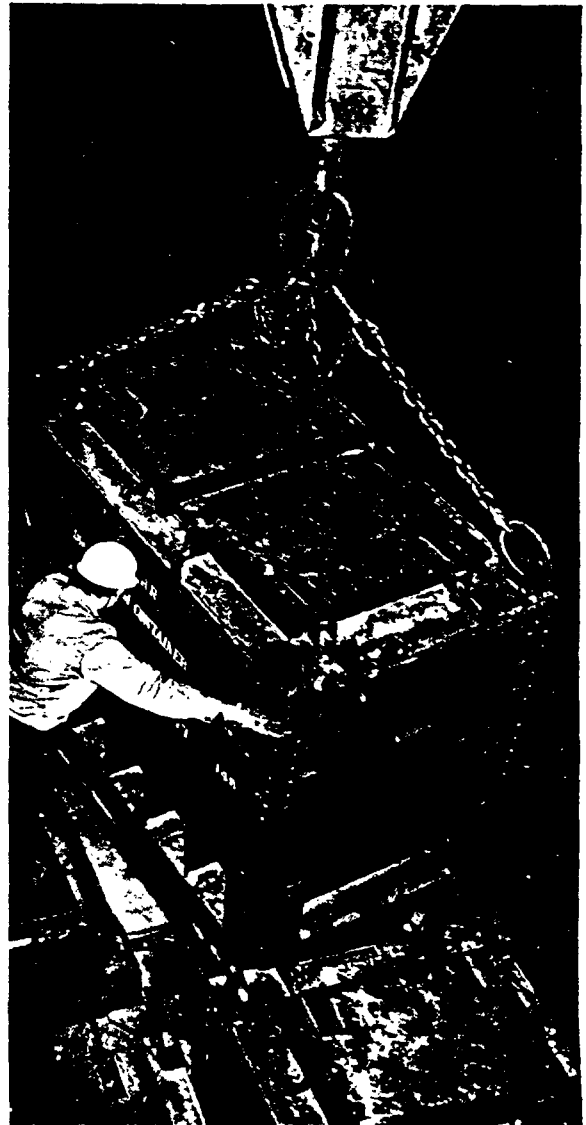
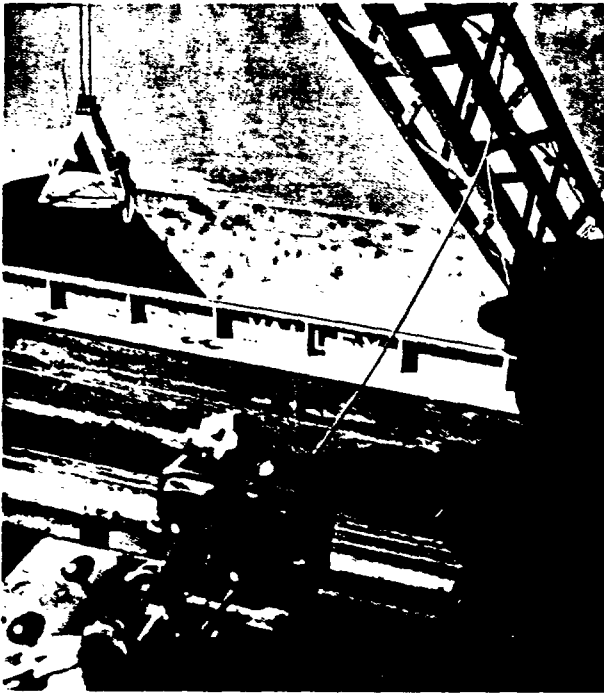
Minerva Pelletized Fluorspar is a top-quality, exactly uniform product available in size from $\frac{3}{8}$ " through $\frac{7}{8}$ " in $\frac{1}{8}$ " increments. Three grades on the market have a total calcium fluoride content of 85%, 90% and 94% respectively. Pellets are shipped to steel plants in pallet boxes or in bulk and are clean, dry and undamaged by weather or transportation conditions. They can be handled and stored in the same manner as gravel fluorspar.

ONCO Ceramic Fluorspar is guaranteed to contain a minimum of 97% calcium fluoride. Shipments average 97.5%. This product, used by ceramic and glass manufacturers, is low in iron; and lead, zinc and sulphur analyze trace to nil. Oglebay Norton also offers for sale a domestic ceramic fluospar available in various grinds and chemical specifications. This material is produced in Southern Illinois. On request, we will gladly furnish a detailed analysis and samples of each of these products.



1 Polystyrene floorpat being unloaded from a barge to warehouse in the Pittsburgh area. From here, it is loaded into trucks for pneumatic delivery to customers' plants in a controlled dry condition.

2 Floorpat pellets being delivered in container cars to a customer's plant. Another example of customized handling and service offered by Ogilby Norton Company.



ONMEX FLUORSPAR-METALLURGICAL GRADE

Onmex metallurgical fluorspar is a natural ore free of flotation concentrates or limestone additions. The fluorspar is crushed and screened to required physical specifications. Onmex is not contaminated by lead, zinc, or other sulphides. It is guaranteed 72.5% effective units of CaF_2 with shipments averaging 74-75% effective.

Chemical Analysis:

Effective Calcium Fluoride UnitsGuaranteed 72.5%
Silica 3-6
Total Calcium Fluoride78-88
Sulphur, Lead, ZincNil

Physical Analysis:

2 inch Maximum1/16 inch Minimum
Minimum of Fines

SHIPPING POINT

Shipments are made from Brownsville, Texas, Tampico, Mexico; or from stockpiles in Cleveland, Ohio. Transportation is via rail, truck, barge, lake vessel, or ocean vessel.

MINERVA FLUORSPAR PELLETS

Minerva fluorspar pellets, a new and unique approach to fluxing, stress uniformity—a factor which helps to eliminate one more variable in today's production of steel. The pellets flow freely because they are dry and this feature, along with their chemical and physical uniformity, means that they are ideally suited to today's computerized basic oxygen furnace operations where precise control of additions is a must. At the same time, their use is not limited to the basic oxygen furnace for they are readily accepted by electric and open hearth furnace operators.

Although the pellets are stored under cover and arrive at the consumer's plant completely dry, they may be stored outside over extended periods and weather will not alter their quality or physical characteristics. This has been proven by subjecting various samples to multiple cycles of soaking, freezing, thawing, drying, etc. Chemically, the pellets are extremely uniform and very low in trace elements. Strict quality control and multiple sampling throughout the entire process insure this consistency.

The plant, located in Southern Illinois near the Ohio River, is served by barge at Cave-In-Rock, Illinois; by rail at Junction and Rosiclare, Illinois; and by various truck lines. While most shipments are in bulk, the pellets may be bagged, palletized, boxed, etc.

A recent innovation is handling by pneumatic equipment, which can improve material flow and considerably reduce the amount of time normally necessary for unloading.

Chemical Analysis:

	Grade #3-Reg. Average & Typical	Grade #3-L Average & Typical	Grade #3-S Average & Typical
CaF_2	85.02%	82.05%	82.55%
SiO_2	6.00	4.80	11.50
CaCO_3	8.08	12.00	4.80
BaSO_4	0.20	0.20	0.20
R_2O_3	0.70	0.95	0.95

Note. Grades up to 94% CaF_2 are available

ONCO BRAND CERAMIC FLUORSPAR

ONCO Fluorspar, which is produced by Reynolds Mining Corporation, is an extremely uniform product, both chemically and physically. It is guaranteed to contain a minimum of 97% calcium fluoride and shipments average 97.5%. ONCO Fluorspar is low in iron, lead, zinc and sulphur analyze trace to nil. We will gladly furnish samples as well as a detailed analysis upon request.

Typical Chemical Analysis:

Calcium Fluoride 97.68%
Silica57
Calcium Carbonate 1.46
Moisture00

Typical Physical Analysis:

Thru 48 Mesh	100%
Thru 65 Mesh	90
Thru 100 Mesh	80
Thru 150 Mesh	70
Thru 200 Mesh	60
Thru 325 Mesh	40

SHIPPING POINT

Shipments are made from Eagle Pass, Texas in boxcars or covered hopper cars. ONCO Brand Fluorspar is available in bulk or packed in 100 pound four-ply paper bags—palletized on specifications.

ILLINOIS BRAND CERAMIC FLUORSPAR

Illinois Fluorspar is produced from mines in Southern Illinois. It is available for those ceramic and glass producers who do not require a high Calcium Fluoride content in their fluorspar. A choice of chemical and physical grades is offered making it adaptable to all types of production.

Typical Chemical Analysis:

	No. 1 Ceramic	No. 2 Ceramic
Calcium fluoride (CaF ₂)	96.18	91.49
Silica (SiO ₂)	1.22	4.78
Calcium carbonate (CaCO ₃)	2.12	2.89
Iron oxide (Fe ₂ O ₃)	0.10	0.25
Barite (BaSO ₄)	0.17	0.12
Undetermined (R ₂ O ₃)	0.28	0.42
Guaranteed (CaF ₂)	95.00	90.00

Typical Physical Analysis:

	Fine	Reg.	Coarse	Extra Coarse
+65 Mesh	—	—	6%	8%
-65 Mesh	—	100%	94	92
-100 Mesh	100%	98	82	75
-200 Mesh	96	94	53	38
-325 Mesh	86	74	34	15

Shipping Specifications:

Shipments are made by rail or truck in bulk or packed in 100 pound bags. Palletizing is available.

SPIEGELEISEN

Oglebay Norton distributes New Jersey Zinc Company's Horse Head brand Spiegeleisen. Three grades are available with varying manganese content in 10-pound pigs. The method of packaging and shipping is highly flexible and may be easily adapted to a customer's handling problems.

Domestic—Horse Head Brand representative analysis:

*Manganese	19.00%—21.00%
Iron	71.00 — 75.50
Combined Carbon	4.25 — 5.00
Graphitic Carbon	.15 — .35
Silicon	1.00 — 3.00
Phosphorus	.05 — .08
Sulphur	.01 — .03

*Also available with the following ranges of manganese content: 16%—19% • 21%—23% • 23%—25%.

CELESTITE

Imported from Mexico, celestite (strontium sulphate) is used for the manufacture of pyrotechnics, production of electrolytic zinc, and for conversion to strontium carbonate. Celestite is available either as direct shipping ore, or custom ground and bagged.

Approximate Analysis:

SrSO ₄	90% Minimum
BaSO ₄	2 Approx
CaSO ₄	3 Approx
NaSO ₄	Nil

RIM-BLOX

We are sales agent for Rim-Blox, produced by the Rossborough Supply Company, Cleveland, Ohio. Rim-Blox, a degasifying ingot mold addition for rimmed steels, is pressed into 1 oz. and 4 oz. coated briquettes for easy handling and accurate measurement. It is also packed loose in 4 oz., 8 oz., and 16 oz., polyethylene bags. Several compositions are available for both low carbon and high carbon steels. The mold additions are packed in lots of 375 pounds and 500 pounds in fibre drums, and also in cartons of 50 pounds each, palletized. Shipment is direct from Cleveland by truck.

FERRO-PHOSPHORUS

Produced by the Virginia-Carolina Chemical Company, this is available as 24% ferro-phosphorus with silicon specifications being less than 1.00% or between 1.00% and 2.00%. V-C ferro-phosphorus is sized to customer specification and is shipped in containers or bulk.

PHOSPHATE ROCK LUMP

This is a lump phosphate from the Tennessee area. The rock is sorted, washed and sized minus 2 inch to plus 1/4 inch, so that it is well adapted for blast furnace feed. Shipments are made by rail from Tennessee.

Phosphate rock—from Tennessee approximate analysis (dry basis):

Screen Size	-2" + 1/4"
Phosphoric Acid	22.50%
Calcium Oxide	35.50%
Magnesium Oxide	.10%

Potassium Oxide	40%
Sodium Oxide	20%
Sulphur Tri Oxide	—
Sulphur	30%
Carbon Dioxide	1.40%
Fluorine	3.10%
Iron Oxide	4.00%
Alumina	2.30%
Insoluble Matter	29.00%
Organic Matter and Moisture	1.20%

Base Analysis:

25% phosphoric acid, equivalent to approximately 54.6 bone phosphate of lime, or 10.91% phosphorus.

FE003505

FACILITIES, SERVICES AND PRODUCTS

EXECUTIVE OFFICE:
1200 Hanna Building, Cleveland, Ohio

BRANCH OFFICES:
Cincinnati, Ohio
(Cabin Creek Coal Sales Co.)
Detroit, Michigan
Duluth, Minnesota
St. Clairsville, Ohio

LAKE TRANSPORTATION:
Columbia Transportation Division
(Fleet of 18 vessels)
Pringle Barge Line
Sillco Limited
Fairport Machine Shop

C & D HOT TOPS:
Ferro Engineering Division
(Plants No. 1 & No. 2)
(Plant No. 3)

IRON ORE:
Eveleth Taconite Company
Reserve Mining Company
Tennessee Copper Company

Brasamerican Ore Corp.

Cleveland, Ohio

Detroit, Michigan & Cleveland, Ohio
Toronto, Ontario, Canada
Fairport, Ohio

Cleveland, Ohio
Chicago, Illinois

Eveleth, Minnesota
Silver Bay, Minnesota
Copper Hill, Tennessee

Brazil, South America

COAL:

Brule Mine
Ceredo Central Prep. Plant
Shamrock Mines
Saginaw Mine
Shamrock Prep. Plant
Norton Mine

DOCKS:

Bay City Seaway Terminal
Saginaw Dock
Toledo Overseas Terminals Co.
Western Navigation Company

RAW MATERIALS:

Fluorspar
Celestite
Ferro-Phosphorus
(Sales agent for:
Virginia-Carolina Chemical Company)
Rim-Blox
(Sales agent for:
Rossborough Supply Company)
Spiegelisen
(Distributor for:
New Jersey Zinc Company)

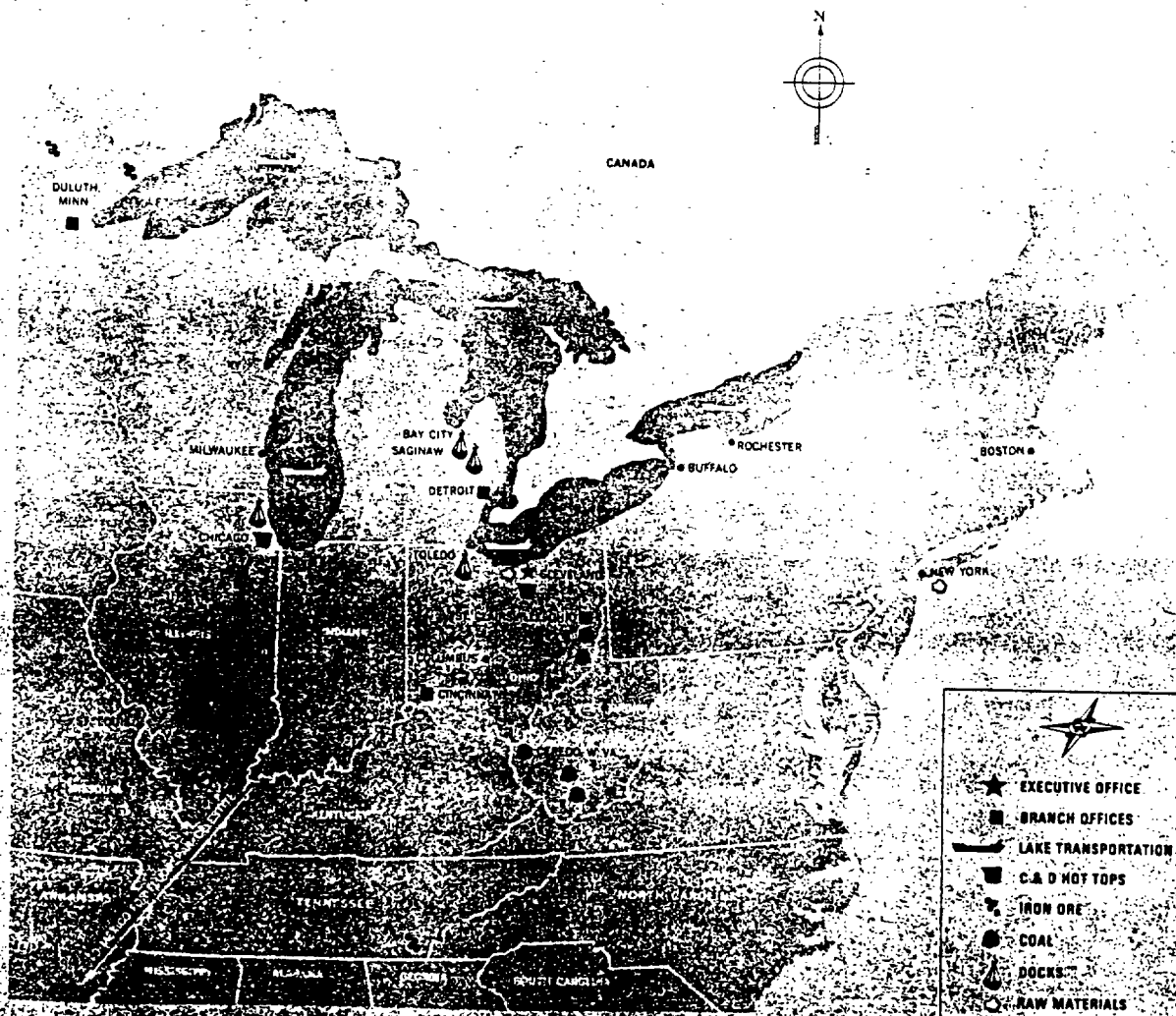
Osage, West Virginia
Ceredo, West Virginia
Kayford, West Virginia
St. Clairsville, Ohio
Kayford, West Virginia
Jacobsburg, Ohio

Bay City, Michigan
Saginaw, Michigan
Toledo, Ohio
Chicago, Illinois

from Mexico & Illinois
from Mexico
from Tennessee

Cleveland, Ohio

New York



FE003506