

CROSBY MINE

ANNUAL REPORT FOR 1922.

No mining activities were undertaken at the Crosby Mine during the year 1922. Underground work was discontinued May, 1921, and was never resumed.

There is approximately 60,000 tons of high grade wash ore remaining in the track and shaft pillar. Aside from this, there is some scattered wash ore on and below the main haulage level. This material for the most part is quite low grade and the cost of extraction is relatively high.

Estimates were made on the cost of removing the track and shaft pillar and the necessary alterations to do this. According to the terms of our lease and the requirements of the Fee Owner's Agent, this ore could not be profitably handled and the other tonnage underground would not justify a continuation of operations by itself.

After considering the matter carefully, a report was made and it was decided to throw up the lease. A formal notice of surrender of the lease was sent to the Fee Owners on October 31st. Under the terms of the lease, this gave us until December 31st. to remove our property from the Crosby ground, but the Fee Owner's Agent extended this time until next spring. The lease on the washing plant and other auxiliary lands continues for a period of 25 years after the cancellation of the Crosby Mine lease.

During the first months of the year only two men, a day and night policeman, were employed at the Crosby property. Daily trips of inspection were made to the washing plant and storage dam and the regular policing of the mine premises was carried on.

A small force of men was employed in March and April in cleaning the surface drainage ditches of snow and debris, so that the spring flood water would be taken care of. The ground under the storage dam spillway had heaved and cracked the concrete in places. It was necessary to do some repair work here in the spring to hold back the water.

The Great Northern section crew spent some time during April in repairing the Crosby Mine tracks and laying a track for stockpile loading.

It was found necessary to secure additional pumping equipment in connection with the open pit operations at the Boeing and the Crosby underground centrifugal pump was brought to surface and shipped to Hibbing.

We received word to start washing our stockpile on June 22nd and a small crew was hired to put the plant and equipment in shape for this work.

A force of from six to 10 men were engaged from the latter part of June until early in September in removing rails, trolley equipment, the Model "28" shovels, pipe, motors cars and other mining equipment. This work progressed very satisfactorily, although we had to do some cleaning and repairing of drifts in order to remove all of the rail and sub-level cars.

Two cars of 40-lb. rail were loaded and shipped to Michigan. This rail was in first class condition.

One care of machinery was forwarded to Gwinn on October 12th. This consisted of the hoist, with motor and electrical equipment, two sets of dump plates from the shaft house, the Sullivan compressor with a 50 HP motor and the motor generator set, with the electrical equipment. Included in this car were also the four 4-ton skips.

The two Model "28" shovels, Nos. 12 and 13, were loaded on flat cars and shipped to the Hill-Trumbull Mine on October 23rd. These machines will be stored here until they are required at some other property. The shovels can be repaired at the Hill-Trumbull to good advantage whenever the occasion demands.

Two of the 6-ton underground locomotives were overhauled and shipped with the Helmer Mine boiler to the Spies Mine at Iron River. All the repair parts for these locomotives were shipped with them, as our other motors in this district are of different design. The other two underground locomotives at the Crosby Mine, which were purchased in 1915, were sent to the Hill-Trumbull Mine. They will be overhauled there and sent to one of our other operations when desired. These locomotives are of a much later design and better machines than the two sent to the Spies.

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A considerable amount of old scrap plates and rail were sold to the Hill-Trumbull Mine for repair work in connection with the washing plant. Arrangements were made to dispose of the rest of the Crosby scrap to the West End Scrap Iron & Metal Company of Duluth. The loading of this scrap was started the latter part of December and should be completed early in January.

The Marion Model "60" shovel, which was used for stockpile loading, the six standard railway cars, the 45-ton railway locomotive and the six 7-yd. dump cars, were sent to the Hill-Trumbull Mine for storage during October. This equipment can be repaired to good advantage at the Hill-Trumbull and will be held there until there is some use for it at some of our other properties. It is quite likely that we will be able to use most of this equipment to advantage in our Mesaba Range properties this year.

All of the mine supplies were transferred from the warehouse to the machine shop and will be held there until shipped to some of our other properties.

The two cottages, four dwelling houses, office-warehouse, and barn, were sold to Mr. P. H. Tweed of Nashwauk the forepart of November, for a consideration of \$2,500.00.

#### WASHING PLANT

Washing plant operations were started July 5th and the stockpile was loaded out by September 29th.

We aimed to turn out 1,000 tons of concentrates per 10-hour shift, operating days only, but due to the fact that there was considerable frost in the pile and the Great Northern car service was poor, we fell somewhat short of this figure. There was considerable frost at the bottom of the pile and it was necessary to break these chunks down before they could be handled to advantage at the mill. This slowed up our operations appreciably. The Great Northern car supply was rather poor at times and we frequently suffered losses of from two to three hours duration. On account of the dock situation, we were forced to close down entirely from July 19th to the 22nd, inclusive.

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We operated the Crosby washing plant during the past season with a force of 13 men, including the foreman. The mill operated very satisfactorily, and with the exception of several shut downs to repair the conveyor belt, there were no serious interruptions. The old conveyor belt was in poor shape to start with, but by repeatedly patching it, we were able to get through the season. The belt was worthless when it was taken off.

The mill was given a thorough overhauling during the winter of 1920-1921 and as the service last year was lighter than usual, the repairs to put it in first class shape should not be heavy.

The following is the tonnage and analysis of the crude ore treated and the concentrates secured during 1922:

	<u>Tons</u>	<u>Fe.</u>	<u>Phos</u>	<u>Sil.</u>
Crude Ore Treated During 1922-----	95,510	44.68	.043	29.46
Bessemer Concentrates Produced During 1922-----	18,814	58.63	.045	8.95
Non-Bessemer " " " 1922-----	<u>39,339</u>	<u>58.67</u>	<u>.051</u>	<u>8.98</u>
TOTAL CONCENTRATES PRODUCED DURING 1922-----	58,153	58.72	.049	8.97

According to our skip tally, we had 89,754 tons of crude ore in stock. We loaded out 95,510 tons, thus securing an overrun of 5,756 tons on the crude ore.

We estimated our ratio of concentration at 60%, figuring the Bessemer concentrates at 18,000 tons and the Non-Bessemer at 36,000 tons. Our actual gross recovery was 60.9%, giving us an overrun of 4,154 tons in the concentrates, 851 tons in the Bessemer and 3,303 tons in the Non-Bessemer.

Our recovery of iron units amounted to 80.02%, which compares with 80.91% for the season of 1920.

The final clean-up cut with the stockpile shovel entailed considerable work, as we scraped all the ore and sorted out considerable rock.

The average analysis of the product from the machines for the past season was as follows:

	<u>Fe.</u>	<u>Phos</u>	<u>Sil.</u>
Screen-----	55.01	.050	12.92
Logs-----	58.51	.051	8.93
Turbo-----	58.89	.037	10.48
Tables-----	63.56	.022	6.79
Tailings-----	31.80	---	--

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At the conclusion of washing operations, all of the piping at the mill was disconnected and drained. The machines were carefully oiled and greased and everything put in shape for an indefinite shutdown. The old conveyor belt was taken off.

As the mill is to be leased to the M. A. Hanna Company, no repairs were attempted. It was considered advisable for the M. A. Hanna Company to make such repairs as they deemed advisable, and thus in case anything went wrong, it would be entirely their lookout. As stated before, the repairs should not be extensive, as the machinery was in relatively good shape at the end of the season.

When the lease to the M. A. Hanna Company has been executed, we will go over the mill carefully with the M. A. Hanna Company's representatives, so as to determine just what shape the machinery is in. It is the understanding that the mill will be turned back to us in the same shape as it was when leased, ordinary wear and tear excepted.

SHIPMENTS

Following are the cargoes of Crosby concentrates shipped during the 1922 season and the analysis of same as obtained at the Mine and by the Lower Lake Chemists:

BESSEMER ORE

PIONEER - - - - - 7/20/22 - - - - - 2,999 Tons.

	<u>Fe.</u>	<u>Phos</u>	<u>Sil.</u>	<u>Mois.</u>	<u>Fe.Nat.</u>
Mine-----	59.37	.045	8.73	----	----
Crowell & Murray-----	58.45	.045	----	7.53	54.05

ISHPEMING - - - - - 8/10/22 - - - - - 2,706 Tons.

Mine-----	58.67	.045	8.98	----	----
Hughes-Guentzler-----	58.10	.048	----	7.34	53.84
Oscar Textor-----	58.00	.047	----	7.04	53.92

J. H. SHEADLE - - - - - 8/20/22 - - - - - 2,170 Tons.

Mine-----	59.29	.045	8.60	----	----
Oscar Textor-----	60.10	.045	----	7.45	55.62
Hughes-Guentzler-----	59.50	.044	----	7.39	55.47

PONTIAC - - - - - 8/27/22 - - - - - 2,356 Tons.

Mine-----	58.84	.046	8.59	----	----
Oscar Textor-----	58.45	.045	----	7.82	53.88
Cremer & Case-----	58.80	.045	----	7.26	54.53

PANAY - - - - - 9/16/22 - - - - - 3,870 Tons.

Mine-----	58.81	.045	9.00	----	----
Cremer & Case-----	58.50	.045	----	7.39	54.18

MICHIGAN - - - - - -10/17/22- - - - - 4,713 Tons.

Mine-----	58.80	.045	11.67	----	----
Hughes-Guentzler-----	57.95	.047	----	6.59	54.13
Oscar Textor-----	58.10	.044	----	6.41	54.38

NON-BESSEMER ORE

PONTIAC - - - - - 7/13/22 - - - - - 2,106 Tons.

Mine-----	57.88	.052	9.86	----	----
Oscar Textor-----	58.40	---	----	7.36	54.10

HARRY YATES - - - - - 8/4/22 - - - - - 9,517 Tons.

Mine-----	58.66	.052	8.95	----	----
Cremer & Case-----	59.00	----	----	7.04	54.85

J. T. KOPP - - - - - -8/21/22- - - - - 8,561 Tons.

Mine-----	58.72	.051	8.97	----	----
Oscar Textor-----	59.10	---	----	7.57	54.63

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C. F. MOLL----- -9/6/22----- -8,400 Tons.  
 Mine----- Fe. Phos Sil. Mois. Fe.Nat.  
 58.69 .051 8.89 -----  
 Cremer & Case----- 59.00 --- --- 7.83 54.38

C. F. MOLL----- -9/24/22----- -8,474 Tons.  
 Mine----- 58.81 .050 8.67 -----  
 Growell & Murray----- 58.75 --- --- 7.38 54.41

M. A. REEB----- -11/6/22----- -5,621 Tons.  
 Mine----- 58.99 .055 7.59 -----  
 Oscar Textor----- 58.00 --- --- 6.13 54.45

The Bessemer Concentrates were shipped in six cargoes, which averaged  
 as follows:

	<u>Tons</u>	<u>Fe.</u>	<u>Phos</u>	<u>Sil.</u>	<u>Mois.</u>	<u>Fe.Nat.</u>
Mine Analysis-----	18,814	58.94	.045	9.54	-----	-----
Lower Lake Analysis-----	18,814	58.43	.046	-----	7.15	54.27

The Non-Bessemer Concentrates were shipped in six cargoes, averaging  
 as follows:

	<u>Tons</u>	<u>Fe.</u>	<u>Phos</u>	<u>Sil.</u>	<u>Mois.</u>	<u>Fe.Nat.</u>
Mine Analysis-----	39,339	58.71	.052	8.75	-----	-----
Lower Lake Analysis-----	39,339	58.81	---	-----	7.26	54.54

The composite samples of the season's shipments shows the following  
 results:

	<u>Tons</u>	<u>Fe.</u>	<u>Phos</u>	<u>Sil.</u>	<u>Mn.</u>	<u>Alum</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Loss</u>
Bessemer-----	18,814	58.68	.045	8.89	1.49	1.11	.18	.13	.012	3.54
Non-Bessemer-	39,339	58.63	.050	8.94	1.58	1.08	.20	.15	.013	3.52

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AVERAGE MINE ANALYSIS ON CRUDE ORE FOR YEAR 1922.

GRADE	IRON	PHOS.	SILICA
Crosby Crude,	(No Production)		

AVERAGE MINE ANALYSIS ON CONCENTRATES FOR YEAR 1922.

GRADE	IRON	PHOS.	SILICA
Crosby Bessemer Concts.,	58.83	.045	8.95
Crosby Non-Bess. Concts.,	58.64	.050	9.02

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1922.

GRADE	IRON	Mine PHOS.	SILICA	Lake Erie IRON	Erie MOIST.
Crosby Bessemer,	(All Mixed)				
Crosby,	58.67	.051	8.93	58.93	7.44

ORE STATEMENT AND SHIPMENTS FOR YEAR 1922.

	CRUDE ORE	CONCEN- TRATES	SHIPMENTS	PERCENTAGE OF RECOVERY	TOTAL LAST YEAR
On hand January 1, 1922,	89,754	-	-		30,621
Output for Year,	-	58,153	58,153	61 %	59,133
Stockpile Overrun,	5,756	-	-		-
Total,	95,510	58,153	58,153		89,754
Crude Ore Treated,	95,510				
Balance on Hand,	-	-			89,754
Decrease in Output,	53,377				
Decrease in Ore on Hand,	89,754				

1922 -- Mine idle during Year.  
Washing Plant operated from July 5th to Sept. 30th, 1922.

1921 -- 2-8 Hour Shifts, Jan. 1st to May 8th, 1921.  
Mine closed May 7th, 1921.



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COMPARATIVE MINING COST FOR YEAR

	1 9 2 2	1 9 2 1	INCREASE	DECREASE
PRODUCT (Crude)	5,756	59,133		
Underground Costs		1.462		
Surface Costs		.194		
General Mine Accounts		.088		
Cost of Production		1.744		
Original Cost		.026		
Plant Account		.044		
Taxes		.169		
Central Office		.071		
Contingent Expense		.008		
Idle Expense		.425		
Cost Adjustment		.038		
Winter Expense		.006		
Cost on Stockpile		2.531		
Loading and Shipping				
Total Cost on Cars		2.531		
No. Days Operating		108		
No. Shifts & Hours		2-8hr		
Avg. Daily Product		548		
<u>COST OF PRODUCTION</u>				
Labor		1.329		
Supplies		.415		
Total		1.744		

Mine closed May 7, 1921. 5756 tons is Stockpile Overrun.

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COMPARATIVE WAGES AND PRODUCT

	1 9 2 2	1 9 2 1		
PRODUCT	5,756	59,133		
No.Shifts & Hours		2-8hr		
AVG.NO.MEN WORKING				
Surface	5	9		
Underground	2	36		
Total	7	45		
AVG.WAGES PER DAY				
Surface	4.68	5.33		
Underground	4.66	5.98		
Total	4.68	5.85		
WAGES PER MO.OF 25 DAYS				
Surface		133.25		
Underground		149.50		
Total		146.25		
PRODUCT PER MAN PER DAY				
Surface		20.81		
Underground		5.53		
Total		4.37		
LABOR COST PER TON				
Surface		.256		
Underground		1.082		
Total		1.338		
AVG.PRODUCT PER 'G & TRM'G BASED ON CRUDE ORE		7.05		
TOTAL NO. OF DAYS				
Surface	1468- <sup>3</sup> / <sub>4</sub>	2,841		
Underground	637- <sup>1</sup> / <sub>4</sub>	10,693- <sup>1</sup> / <sub>4</sub>		
Total	2106	13,534- <sup>1</sup> / <sub>4</sub>		
AMOUNT FOR LABOR				
Surface	6,879.04	15141.99		
Underground	2,967.58	63961.97		
Total	9,846.62	79103.96		

Mine closed May 7, 1921.  
 Lease surrendered Dec.31, 1922.      5756 tons stockpile overrun.