

HILL-TRUMBULL MINE
ANNUAL REPORT FOR 1919.

Engineering work at the Hill-Trumbull property was started in March and a crew of four men was transferred to Marble the latter part of this month. A considerable amount of preliminary work was done by this crew during the Summer, more especially in connection with the washing plant project and the railway tracks leading thereto from the open pit.

RAILWAY TRACKS

A force of men was employed the latter part of September and the work of laying track into the Hill Pit and extending the line to the north from the Great Northern yards, was begun. It was also necessary to re-tie the two westerly tracks of the Great Northern yard, which we have under lease. These jobs were pretty well completed by the middle of October, when our 85-C Bucyrus steam shovel and one of the 45-ton locomotives were received.

Arrangements were made with the Great Northern Railway to build the spur from their main line to our washing plant. The Great Northern Company let this out on contract and the work of grading was completed on the 24th of December. The construction company is now laying steel and will ballast the tracks sufficiently, so that structural steel may be delivered to our washing plant site, on or soon after March 1st. This spur will be about $1\frac{1}{2}$ miles in length, approximately one-half of which will be double tracked, to accommodate sufficient empties and to allow for the switching out of loads. It is the intention to complete the ballasting of this track during March and April, when weather conditions are favorable.

The model "36" Marion shovel was received from the Crosby Mine on the 28th of November and was set up and started HILL-TRUMBULL MINE.

digging for our railroad grade across the old Hill dump. It was necessary to make a cut, varying from 2' to 8' in depth along 1,100' of the dump, in preparing a grade for our washing plant track. The track was extended from the end of this grade onto the dump trestle, which was put in use on the 15th of December. In order to affect satisfactory and desirable grade conditions and also cut down the height of our trestle, leading from the dump to the washing plant, it was advisable to make the above cut. The ground was frozen down about 3' and we were obliged to blast in front of the shovel. The material was cast along the two sides and will be mucked back with the "36" shovel when weather conditions are favorable in the Spring. While the dump is approximately 40' in height, it is largely of a clay material and we encountered several very soft spots in our cut, necessitating the use of long sill timbers to support the shovel. Apparently the rain water had seeped down to the impervious clay and thereby softening the ground. No material had been placed on this part of the dump for the past seven years and we were very much surprised to find the soft ground in making our cut.

A 28' railway bridge, spanning the County Highway at the approach end of the dump, was started on the third of November and completed on the 13th. A force of carpenters from the Crosby Mine was employed on this job.

A contract was let during October for the erection of our washing plant approach trestle at a price of \$1.65 per lineal foot. It will be necessary to fill the approach from two trestles, the ultimate height being too great for one structure. The lower trestle varies in height from 15' to 40' and the upper structure from 1' to 30'. We furnish all material, the contract price simply covers the erection. The work of erecting the first trestle was well along on January 1st. and should be completed within the

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time specified in the contract; namely, February 15th. This job has been carried well ahead of our dumping requirements at all times. The second trestle will be started from the washing plant end upon the completion of the first structure, so as not to interfere with our dumping operations. We will be able to fan out along the dump end of the first fill while the construction of this part of the second trestle is in progress. We will, of course, be obliged to put a substantial shoulder on the first dump before erecting the secondary trestle, where the fill reaches an appreciable height.

In order to take care of the Mud Lake drainage, it was necessary to construct a culvert 180' in length. This culvert was built of 12" x 12" timbers and will be covered with a fill approximately 40' in height. The work was done by contract at a price of \$3.50 per lineal foot. We furnished all the material for this job.

WASHING PLANT

The surveys for our washing plant were completed in the Summer and our definite plans decided upon the latter part of the year.

A contract was let during October for the delivering of gravel on the mill site at a price of \$1.85 per cubic yard. The contractor completed this work on December 5th, the total quantity amounting to 777 yards.

The railroad construction crew was given a contract for the grading of our mill site at a price of 75¢ per cubic yard. This work was started on the 12th of November and completed on the 26th, the material excavated amounting to 1,234 cubic yards.

Excavation for our washing plant piers was started the forepart of November and completed the middle of December.

This job progressed rather slowly, due to the heavy frost and the large quantity of boulders encountered. The forms are to be set during January and the concrete poured as soon as weather conditions are favorable. We have a one-quarter yard concrete mixer, equipped with a heating device, on the ground and the gravel required for the plant piers, also the crusher and receiving bin foundations, has been delivered as noted above. A large quantity of boulders, encountered in the excavation for the site and piers, were piled in the vicinity and will be used in the foundations.

OPEN PIT OPERATIONS

The second-hand 85-C Bucyrus steam shovel, purchased by Mr. McClure in East St. Louis, was received and put in shape for operation the latter part of October. The first job undertaken with this shovel was the casting for the railroad grade just north of the Great Northern yards. Upon the completion of this work, October 24th, the shovel was moved into the Hill approach and was engaged until the 18th of November in digging a drainage cut along the east side of the track. The material from the cut, amounting to 6,372 cubic yards, was removed from the pit and used in raising the new track to the north of the yards. One of the 45-ton locomotives, purchased from Butler Brothers, and the second-hand 12-yard cars were used in this operation. Some delay was encountered in the prosecution of the work, due to a seam of quick sand in the bottom of the cut. It was necessary to do some cribbing in order to keep the sand from washing.

The yardage handled here per shift was very light, due to the fact that the material could not be distributed along the track in any quantity.

Upon the completion of the drainage cut along the approach track, the 85-C Bucyrus shovel was taken out of the pit

and turned around in order to attack the stripping bank to the best advantage. Stripping operations along the north side of the Hill approach were started on November 20th, the early work here being restricted for a time on account of the limited quantity of material, which we could handle to advantage along the tracks to the north. It was extremely difficult to raise the tracks and take care of any amount of frozen material. It was necessary to widen out the approach to the stripping dump and throw our tracks to the east in order to get our tracks lined on the right of way provided for us by the agreement between the Arthur Iron Mining Company and the Oliver Iron Mining Company.

The second 45-ton locomotive was placed in operation in November. We handled 9,972 cubic yards during this month, the quantity being comparatively small, due for the most part to the fact that the shovel cut was extremely shallow and our capacity for handling the material was very much restricted. Aside from this, there were the usual number of delays incidental to starting a job of this sort and it was necessary to make some repairs on our 12-yard air dump cars.

The progress of the work during December was also affected to a considerable extent by our being limited in dumping capacity. The grade to our approach trestle was not completed until the latter part of the month and the 22,696 yards of stripping was dumped along the old approach shoulder and our tracks thrown out onto the new fill. We had handled a total of 32,688 yards of surface material by the first of the year.

Progress of our operations were delayed somewhat during December on account of the strike on the coal docks, by the holiday season and very severe weather. One of the 12-yard air dump cars went over the side of the dump and a broken cap on our trestle was responsible for tipping over a second car. The cars were not damaged to any great extent and the necessary repairs were made

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within a few days after the accident. The posts on the trestle were shoved out from under the caps and this resulted in breaking the stringers. This difficulty has been largely overcome by the use of wire stays, fastened from the top of each post back of the stringers.

The Bucyrus shovel lost some time due to breaks and derailments. We are working on a very high bank and side slides frequently bury the jack arms. One shift was lost on December 31st., due to the breaking of a jack arm, which was struck by a large chunk of frost. The hoisting chain failed in several places and it was necessary to install a new chain on December 28th.

The first cut will be approximately 1,600' in length and we anticipate that it will be completed the latter part of January. The bank varies from 50' to 70' in height, but the first cut is entirely in slope material and the high bank was not blasted. We expect to get some very good ballasting material along the last 500' of the cut. Preparations were made to blast the bank behind the shovel and we figure on moving back and starting the second cut by the first of February. Due to the considerable height of the bank, the material from the second cut will be loaded on the same track as the first. The track will be shifted in toward the bank for the third cut.

Our washing plant approach fill will require 351,000 cubic yards of material and we now figure on completing the work, also extending and ballasting our track to the washing plant, by the first of July. We also anticipate the completion of an additional 350,000 cubic yards of stripping during the coming year.

Arrangements were made with the Oliver Iron Mining Company to take care of any necessary repairs to our equipment in their old Hill shops and we have also secured our water supply from them. The local management of the Oliver Iron Mining Company has been most accommodating and our arrangements with them have

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assisted materially in keeping our operations going.

The general labor situation in and about Marble has been quite satisfactory and it is our opinion that we will be able to secure sufficient hands for the job, after we have erected the four boarding houses, four cottages and captain's house, contemplated.

ACCIDENTS

There was only one accident of a serious enough nature to be reported. The description of this accident follows:

LOUIS LUIVENE

Injured-----November 13th, 1919.
 Occupation-----Laborer.
 Nationality-----French.
 Time Lost-----52 Days.
 Compensation Paid-----No payment to-date.

Remarks: In lifting a track jack Luivene sprained his back. He has received no compensation, due to the fact that the attending physician expressed the opinion that Luivene feigned illness for too long a period after the injury, that he could and should have returned to work within a short time. Luivene has made no complaint thus far and we are not making a report for final compensation until a further investigation is made.

ESTIMATE OF PRODUCTION

The estimate of production from the Hill-Trumbull Mine for the year 1920 is 350,000 tons. This estimate is based on the assumption that our washing plant will be ready for operation on the first of July. Should there be a delay of one month in the starting of our mill, the production will be reduced by 100,000 tons.

Following is a detail of the estimate as to grade and the analysis of same:

	Tons	Fe.	Phos	Sil.	Mois.	Fe.Nat.
Bessemer Direct Shipping-	62,500	58.00	.045	13.00	9.00	52.78
Bessemer Concentrates----	112,500	60.00	.045	8.50	8.00	55.20
Non-Bess.Direct Shipping-	62,500	59.00	.060	11.50	9.00	53.60
Non-Bess. Concentrates----	112,500	60.00	.075	8.50	8.00	55.20
TOTAL- - - - -	350,000	59.46	.057	9.84	8.36	54.49

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The silica content in this direct shipping ore is rather high. We have been most conservative in our estimates and we feel that it may be possible to grade our direct shipping ore so as to obtain a lower silica content in the Bessemer especially. Based on our results at the Crosby mill, the silica content of the Hill-Trumbull concentrates should be somewhat lower than we have shown, but we feel that it is advisable to be conservative in that this is a new ore.

Unfortunately the proportion of direct shipping ore to the concentrates is much larger for the year 1920 than it will be any year thereafter, also the tonnage of direct shipping ore in 1920 will be decidedly limited and we will, therefore, have very little leeway in the matter of grading. Subsequent to 1920 we will have a larger tonnage of direct shipping ore uncovered and will be able to do more grading, as regards this particular material. According to our schedule of production, 36% of the 1920 output will be direct shipping ore, whereas it will amount to only 23% in 1921 and 22% in 1922 and 1923.

Hill-Trumbull Ore Estimate of January 1st., 1920.

Following is an estimate of the ore in sight at the Hill and Trumbull properties on January 1st., 1920. A factor of 14 cubic feet per ton was used in the case of the direct shipping ore and 18 cubic feet for the wash material.

	HILL MINE		TRUMBULL MINE		T-O-T-A-L	
	DIRECT	WASH	DIRECT	WASH	DIRECT	WASH
Bessemer-----	1,123,000	2,215,000	85,000	3,453,000	1,208,000	5,668,000
Non-Bessemer-	1,123,000	813,000	365,000	649,000	1,488,000	1,462,000
TOTAL-----	2,246,000	3,028,000	450,000	4,102,000	2,696,000	7,130,000

The above table shows a total of 5,274,000 tons for the Hill Mine and 4,552,000 tons for the Trumbull, or a grand total of 9,826,000 tons for these properties.

The average analysis of the Hill-Trumbull ores are as follows:

<u>TRUMBULL MINE</u>					
Tons	Fe.	Phos	Sil.	Fe.Nat.	
85,000	58.40	.040	12.79	51.32	
365,000	58.04	.060	9.85	52.82	
3,453,000	60.00	.043	8.00	55.50	
649,000	60.00	.080	8.00	55.50	
4,552,000	59.78	.050	8.34	55.21	

<u>HILL MINE</u>					
Tons	Fe.	Phos	Sil.	Fe.Nat.	
5,274,000	56.61	.050	12.54	50.95	

The Hill-Trumbull properties have now been thoroughly explored and we do not expect to add any appreciable tonnage, as the result of development work. We do not anticipate any explorations during 1920, further than for the purpose of grading the material in our shovel cuts.