A comparison of the Mine and Lower Lake analysis on the cargoes of straight Hill-Trumbull ore follows:

	TONS.	FE.	PHOS	SIL.	MOIS.	FE.NAT.
Mine Analysis----------	494,572	58.65	.060	8.61	7.51	54.24
Lower Lake Analysis----	494,572	58.40	---	----	7.35	54.11

A composite analysis of the season's shipments follows:

	FE.	PHOS	SIL.	MN.	ALU.	MAGNESIA	LIME	SULPHUR	LOSS
Hill Concentrates------	58.60	.055	9.95	.15	.40	.19	.20	.011	5.45
Trumbull Concentrates--	58.52	.062	8.14	.10	.49	.32	.28	.008	7.15
Hill Direct------------	58.90	.055	9.51	.12	1.01	.21	.25	.008	4.84

HILL-TRUMBULL MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1925.

GRADE	IRON	PHOS.	SILICA
Hill Bessemer Concentrates,	(No Production)		
Hill Non-Bessemer Concentrates,	58.68	.056	9.85
Hill Direct,	58.94	.057	9.39
Trumbull Bessemer Concentrates,	(No Production)		
Trumbull Non-Bess. Concentrates,	58.53	.063	8.13

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1925.

GRADE	Mine IRON	Mine PHOS.	Mine SILICA	Lake Erie IRON	Lake Erie PHOS.	Lake Erie MOIST.
Hill Bessemer Concentrates,	(No Shipments)					
Hill Non-Bessemer Concentrates,	(All Mixed)					
Hill Direct,	(All Mixed)					
Trumbull Bessemer Concentrates,	(No Shipments)					
Trumbull Non-Bess. Concentrates,	(All Mixed)					

HILL-TRUMBULL MINE

ORE STATEMENT - DECEMBER 31ST, 1925.

	HILL CRUDE	HILL BESS. CONCTS.	HILL NON-BESS. CONCTS.	HILL BESS. DIRECT	HILL NON-BESS. DIRECT	TRUMBULL CRUDE	TRUMBULL BESSEMER CONCTS.	TRUMBULL NON-BESS. CONCTS.	TOTAL	TOTAL LAST YEAR
On hand Jan. 1, 1925	-	-	-	-	-	-	-	-	-	-
Output for Year,	124,845	-	79,377	-	98,893	523,425	-	326,717	504,987	302,989
Total,	124,845	-	79,377	-	98,893	523,425	-	326,717	504,987	302,989
Shipments,	124,845	-	79,377	-	98,893	523,425	-	326,717	504,987	302,989
Balance on Hand,	-	-	-	-	-	-	-	-	-	-
Percentage of Recovery,	63.7%					62.2%			62.6%	
Output Last Year,	209,994	-	134,269	-	15,849	241,730	-	152,871	302,989	
Increase in Output,									201,998	

1925 -- Mine Idle, Jan. 1st to Apr. 25th, 1925.
1-10 Hour Shift, 6 days per week, Apr. 25th to Oct. 8th, 1925.
Mine Idle, Oct. 8th to Dec. 31st, 1925.

1924 -- Mine Idle, Jan. 1st to Apr. 26th, 1924.
1-10 Hour Shift, 6 days per week, Apr. 26th to Sept. 13th, 1924.
Mine Idle, Sept. 13th to Dec. 31st, 1924.

HILL-TRUMBULL MINE

COMPARATIVE MINING COST FOR YEAR

	1925	1924	INCREASE	DECREASE
PRODUCT				
Direct Shipping	98,893	15,849	83,044	
Concentrates	406,094	287,146	118,948	
Total Production	504,987	302,995	201,992	
DIRECT SHIPPING ORE				
Labor	.095	.082	.013	
Supplies	.043	.059		.016
Total	.138	.141		.003
CRUDE ORE - CONCENTRATED BASIS				
Labor	.126	.144		.018
Supplies	.079	.114		.035
Total	.205	.258		.053
MISCELLANEOUS GROUP				
Superintendence	.005	.008		.003
Concentrating	.126	.158		.032
Stripping	.560	.560		
Insurance	.002	.004		.002
District Office	.009	.014		.005
Central Office	.011	.013		.002
Contingent Expense	.0	.0		
Special Expense	.001	.003		.002
Occupation Tax	.037	.076		.039
Taxes	.258	.414		.156
Winter Expense	.123	.187		.064
Cost Adjustment	.002	.004		.002
Depreciation	.200	.200		
Total Cost on Cars	1.526	1.893		.367
Misc. Debits & Credits	.004	.003	.001	
Grand Total Cost	1.530	1.896		.366
DIRECT SHIPPING				
No. Shifts & Hours	1-10-83	1-10-13		
Avg. Daily Product	1,191	1,219		
CRUDE ORE CONCENTRATED BASIS				
No. Shifts & Hours	1-10-141	1-10-115		
Avg. Daily Product	4,598	2,459		

HILL-TRUMBULL MINE

COMPARATIVE WAGES AND PRODUCT

	1925	1924	INCREASE	DECREASE
PRODUCT	504,987	302,995	201,992	
No.Shifts & Hours	1-10	1-10		
AVG.NO.MEN WORKING	103	97	6	
AVG.WAGES PER DAY	5.08	5.13		.05
PRODUCT PER MAN PER DAY	27.18	23.17	4.01	
LABOR COST PER TON	.187	.222		.035
TOTAL NO. OF DAYS	18578½	14703-1/4	3875-1/4	
AMT. PAID FOR LABOR	94311.82	67143.62	27168.20	

In 1923 Production from May 5th to Oct.3rd.
1924 " Apr.26th to Sept.13th.
1925 " Apr.25th to Oct.6th,

HILL-TRUMBULL MINE

STATEMENT OF EXPLOSIVES USED FOR BREAKING ORE

KIND	QUANTITY	AVERAGE PRICE	AMOUNT 1925	AMOUNT 1924
60% Powder	3,100	.1550	480.50	325.50
40% "	6,263	.1350	845.50	600.75
Hercules Special #1	10,750	.1450	1,558.75	2,450.50
" " #2	30,900	.1350	4,171.50	472.50
DuPont Blasting Powder				118.00
" 160				36.25
Trojan Special C				145.00
" 17%				106.20
" CC	16,250	.1165	1,893.13	
" 40%	3,950	.1350	533.25	
" 60%	100	.1550	15.50	
" 20%	750	.1200	90.00	
Total Powder	72,063	.1331	9,588.13	4,254.70
Fuse	1,165	.0062	7.17	
Caps	1,580	.0108	17.02	1.06
Electric Exploders	3,875	.0769	297.95	320.60
Connecting Wire	30	.4177	12.53	8.17
Crimpers	2	1.1450	2.29	
Total Caps,Etc.			336.96	329.83
Total Explosives			9,925.09	4,584.53

	1925 CRUDE & DIRECT	1925 CONCTS & DIRECT	1924 CRUDE & DIRECT	1924 CONCTS & DIRECT
Product	747,163	504,987	467,573	302,995
Lbs.Powder per ton of Ore	.0964	.1427	.0643	.0993
Cost per Ton for Powder	.0128	.0190	.0091	.0140
" Caps,Etc.	.0005	.0007	.0007	.0011
" All Explosives	.0133	.0197	.0098	.0151
Avg.Cost per Pound for Powder	.1331	.1331	.1414	.1414

Commenced Operating April 25,1925; suspended operations Oct.8,1925.

ANALYSIS OF HILL-TRUMBULL COSTS FOR THE SEASONS OF 1924 & 1925

The production of direct shipping ore in 1925 was 98,893 tons, as compared with 15,849 tons the previous year. The mining cost per ton during 1925 amounted to $.138, as against $.141 for 1924. The labor item against this expense was somewhat higher in 1925, owing to the necessity of doing considerable blasting and more track work, but the smaller cost per ton for supplies in 1925 more than offset this, with the result that there was a reduction of $.003 per ton in the cost.

The production of concentrates in 1925 amounted to 406,094 tons and compares with 287,146 tons in 1924. The mining cost per ton of concentrates in 1925 amounted to $.205, as against $.258 for the previous year, or a decrease of $.053 per ton. Both the labor and supply accounts making up this item were lower in 1925, due in part to the larger tonnage secured, but the larger factor entering into the cost is the more favorable operating conditions. The large tonnage of wash ore was secured from the Trumbull property and it was not necessary to handle very much rock in this operation. Further than this, the work done in the Hill wash ore was in softer average ground and less rock work was entailed.

The following table shows the cost on cars for the ore shipped (Direct and Concentrates) from the Hill-Trumbull properties during the years 1924 and 1925:

	1924 SEASON	1925 SEASON
Mining Cost	.252	.192
Mine Superintendence	.008	.005
Concentrating	.158	.126
Stripping	.560	.560
Insurance	.004	.002
District Office	.014	.009
Central Office	.013	.011
Special Expenses	.003	.001
Depreciation	.200	.200
Taxes	.414	.258
Occupational Tax	.076	.037
Winter Expense	.187	.123
Cost Adjustment	.004	.002
Less Misc. Debits & Credits	.003	.004
TOTAL COST ON CARS	$1.896	$1.530

The average "MINING COST" for 1925 shows a reduction of $.06 per ton, as compared with the previous year. Both the direct ore and concentrates were

produced at less cost in 1925. While there was only a small decrease in the cost per ton of producing direct ore, the 1925 output of this grade was so much greater that it affects the average mining cost for the entire output, appreciably. As noted before, the larger decrease was in the concentrated ore. Aside from the fact that we handled less rock in our 1925 wash ore operations, there was somewhat less track work necessary and we were obliged to cut and lay out a permanent approach track into our Trumbull property during 1924.

The decrease of $.003 per ton in the 1925 item of "MINE SUPERINTENDENCE" is explained by the larger product secured during that year.

Under "CONCENTRATING" there was a reduction of $.032 in the 1925 cost per ton. The actual cost of concentrating was very close for the two years, but in 1925 considerable dyke work was done during the operating season and went against the concentrating costs in 1925, whereas in 1924 this work was largely taken up under winter expense. The averaging in of the direct ore is misleading as it tends to show a large reduction in this item and the tonnage of direct ore in 1925 being so much greater than that of 1924, the cost per ton here is reduced out of proportion.

The captions "INSURANCE", "DISTRICT OFFICE" and "CENTRAL OFFICE" all show a reduction in the cost per ton for 1925 and this is the result of the larger output secured during that year.

The 1925 reduction of $.156 per ton in ad valorem taxes is entirely due to the greater tonnage produced. The actual taxes paid in 1925 were approximately $5,000 greater than for 1924.

The "OCCUPATIONAL TAXES" for 1925 show a decrease of $.039 per ton over those for 1924. This is explained by an adjustment in the 1925 taxes, which was the result of an overcharge, based on the estimates of 1924.

In 1925 the "WINTER EXPENSE" per ton was $.064 less than in 1924. While the actual money charged to this account was about $8,000 higher in 1925, the production was considerably larger and more than offset this. The reason for the larger amount charged to Winter Expense in 1925 was on account of the extensive work undertaken in our washing plant storage basin during the early spring of 1925.

BOEING MINE
ANNUAL REPORT FOR 1925.

Operations at the Boeing Mine were carried on actively during the year 1925. Work underground was pushed forward steadily and the open pit ore operations were conducted from April 30th to November 19th. Upon the completion of the ore season, the large shovel was engaged in surface clean-up work until December 26th.

Stockpile shipments commenced on May 1st. and were concluded August 31st. Loading at the stockpile was somewhat intermittent, such tonnages being forwarded as were necessary to keep the grade on as uniform a basis as possible. Shipments from pocket were made from April 15th to October 26th. The shaft product was stockpiled from January 1st. to April 15th and from October 26th to December 31st.

The following table shows the tonnage and analysis of the ore shipped during the 1925 season:

	TONS	FE.	PHOS	SIL.	MN.	ALU.	MOIS.
Open Pit Shipments----------	291,060	54.57	.077	11.12	.79	4.31	15.69
Shaft Pocket Shipments-------	110,582	55.92	.077	9.89	1.09	3.69	12.73
Shaft Stockpile Shipments----	100,054	56.04	.081	10.26	.97	3.57	12.55
Boeing-Susquehanna Shipments-	2,256	55.99	.078	10.00	.83	3.57	13.73
TOTAL AND AVERAGES----------	503,952	55.16	.078	10.67	.89	4.02	14.41

The tonnage and analysis of the ore placed in stock from October 26th to the end of the year was as follows:

	TONS	FE.	PHOS	SIL.	MN.	ALU.	MOIS.
Boeing----------	31,613	55.78	.076	10.48	1.11	3.88	----

We did not mine and stockpile any Susquehanna ore during the fall of 1925.

The iron content of the 1925 shipments was somewhat below our expectations. We had figured that the grade would be somewhat above that forwarded in 1924, but due to the low iron and high silica in the second class ore mined in the bottom of the east end of the pit, our expectations were not realized. The underground ore produced during 1925 was very close to our expectations.

During 1926 our open pit ore operations will be conducted largely in

the west end of the pit. We will mine all the cretaceous ore remaining in the pit, approximately 44,000 tons, and aside from this, there will be a certain amount of second class ore. We feel, however, from the results of explorations and work to-date in the pit, that the average grade of pit ore for 1926 will be well above that shipped during the past season.

The estimated tonnage and analysis of our 1926 shipments are as follows:

	TONS.	FE.	PHOS	SIL.	MN.	ALU.	MOIS.
Underground Ore----	170,000	55.03	.078	10.44	1.11	4.45	13.06
Open Pit Ore-------	330,000	56.16	.081	10.55	.84	3.18	15.00
TOTAL & AVERAGES---	500,000	55.78	.080	10.51	.93	3.61	14.35

While the estimate of the open pit ore to be shipped in 1926 is approximately 1.50 higher in iron than that forwarded in 1925, the underground ore is approximately one point below that in 1925. The larger tonnage being secured from the open pit, the average iron in the 1926 shipments will be .52 above those of the past season. To be conservative, we have estimated an average moisture of 14.35% for our 1926 shipments, this being based largely on exploratory data, but we feel that it is quite likely that the average moisture will be somewhat under this.

The plans for open pit operations for 1926 call for the removal of all the ore at the west end of the mine, with the exception of the deposits in the deep ore channels. At the conclusion of the 1926 shipping season, we will have removed all of the commercial ore in the Boeing pit with the exception of that in the deep ore channel which extends along the north side of the pit.

The car service provided by the Great Northern Railway Company was much improved during 1925, as compared with the previous year.

Loading conditions in the pit during 1925 were slowed down to a considerable extent on account of the large amount of rock encountered at the east end of the pit and the fact that we were for the large part digging into second class ore and it was questionable as to the amount we should take. In spite of the fact that the ore was drilled and blasted ahead of the shovel, the material broke in very large chunks and it was necessary to do a large amount of block-holing and hand sledging. From the standpoint of operating conditions, the 1926 season should show considerable improvement, as we will not have the hard cretaceous capping ore to contend with and the commercial ore extends down to the taconite largely.

BOEING MINE.

BOEING MINE ORE ESTIMATE OF JANUARY 1ST., 1926

Following is an estimate of the ore in sight at the Boeing Mine on January 1st., 1926:

	TONS.
Underground Ore----------	819,000
Milling Ore----------	338,000
Open Pit - First Class Ore----------	531,000
Open Pit - Second Class Ore----------	264,000
Open Pit - Cretaceous Ore----------	44,500
TOTAL, ----------	1,996,500

The following table shows a comparison between the estimate of January 1st., 1925, with that of January 1st., 1926, deductions having been made for the tonnages mined of the several grades:

	UNDERGROUND	OPEN PIT	MILLING.	TOTAL
Estimate of Jan. 1, 1925---	930,000	1,232,000	338,000	2,500,000
Mined in 1925----------	207,413	291,000	---	498,413
BALANCE----------	722,587	941,000	338,000	2,001,587
Estimate of Jan. 1, 1926---	819,000	839,500	338,000	1,996,500
DIFFERENCE----------	96,413 Inc.	101,500 Dec.	-----	5,087 Dec.

The increase in the tonnage of underground ore as compared with a year ago, and taking into consideration the tonnage mined, is due to the fact that we developed more ore along the west shore line on the lower subs than we had anticipated. The ore was also followed further south along the west shore line than we had expected. In our previous estimates, we had considered a large part of the west shore line as being second class material, but we found upon developing that a considerable part of this material could be mined.

The decrease in the tonnage of open pit ore is the result of our finding that the lower part of the deposit at the east end of the pit contained an unmerchantable grade. Due to the amount of water in the bottom of the east end of the pit, we were unable to put down test-pits and the churn drill holes did not disclose the fact that a part of the deposit was of such low grade that it could not be mined to advantage. Unfortunately several drill holes did not show the existence of a swell in the rock, which also affected the estimated tonnage in this deposit.

BOEING MINE.

The increase in the tonnage of underground ore almost offsets the decrease in the open pit, there being a difference, or shrinkage, of only 5,087 tons in the total of the two estimates, after making deduction of shipments.

The situation as regards the mining of the available ore from a second level, is the same as it was a year ago. We feel that this estimate is conservative and that the ore available from a second level may be considerably in excess of what we have shown. We do not feel justified in assuming a larger tonnage, however, due to the fact that there is considerable second class ore mixed with the better grade and our past experience has made us very cautious in estimating tonnages of this character of ore.

There has been no change in the status of the unavailable underground ore.

The following table shows the expected analysis of the Boeing ore in sight January 1st., 1926:

	TONS.	FE.	PHOS	SIL.	MN.	ALU.
Underground----------	819,000	56.88	.084	8.04	.98	3.56
Milling----------	338,000	56.56	.068	9.76	1.29	2.43
Open Pit Ore - First Class--	531,000	56.07	.078	10.15	1.23	2.99
Open Pit Ore - Second Class-	264,000	54.47	.099	13.66	1.18	1.73
Open Pit Ore - Cretaceous---	44,500	49.40	.119	19.14	.17	6.26
TOTAL AND AVERAGES----------	1,996,500	56.12	.082	9.88	1.10	3.04

GENERAL SURFACE

Comparatively little work was done around the mine and location grounds during the year 1925. While the premises were kept clean and the lawns mowed, no new planting was done.

Our year's timber supply was received during the first three months of the year, most of it being placed along the timber yard to the east of the coal dock and the remainder being taken down into the pit and stored in the vicinity of the timber raise at the west end thereof. As the timber raise at the west end of the pit is only serving three gangs at the present time, only a small amount of timber will be stored here during the present winter.

It was necessary to place four additional bents on our stocking trestle during the month of March to provide room for our shaft output.

On account of our starting mining and caving operations in the East Deposit, it was necessary to change the location of the mine water ditch along the east boundary line of the property and also to have the Great Northern Railway Company shift their track leading into the shaft and coal dock. The Shenango Furnace Company, operating the Webb Mine, had secured surface rights from the Oliver Iron Mining Company for the disposal of their water and we worked out a joint proposition with the Shenango people, whereby our mine water was diverted to the eastward and disposed of in a new ditch, which was constructed by the Shenango Company. In order to divert our water into the Shenango ditch, it was necessary to tunnel for 300' under the Great Northern yard tracks and to place a 36" reinforced concrete culvert pipe. This pipe was placed and the tunnel back-filled. The work was begun early in February, but was not completed until the middle of April, on account of our operations being suspended awaiting a decision as to whether or not we would operate the Boeing Mine underground during 1925.

The Great Northern Railway Company shifted their tracks serving the shaft, stockpile and coal dock, so as to be well back from any settlement from the underground operations in our East Deposit. The contractor for the Railway Company constructed the grades during April and May, but the new track was not

placed in service until June 27th. During August, the Great Northern Railway Company straightened the main line leading into our pit from their ore yards. While this track might not have been endangered by caving, it was considered advisable to make the change. This work was done at the expense of the Great Northern Railway Company.

The erection of our stocking trestle for the handling of this winter's product was carried on during the months of August, September and October. A small crew worked intermittently on the stockpile job.

A sand run in the East Deposit on the night of October 26th blocked the subs at the east end of our main level. In order to dispose of this sand to advantage, it was necessary to commence stocking operations immediately and to dump the sand and washed material into the railway pocket. Stripping cars were placed under the pocket and as they were filled, the locomotives hauled them away and the material was disposed of along the surface tracks.

The old wood sidewalk, which ran along Washington Street when we took over the Boeing property, was used by our employees until last summer. The sidewalk was becoming unsafe and we decided it was advisable to tear it up and replace it with a cinder walk.

The old sewer line, leading to the boarding houses, had given us considerable trouble the past two years on account of its not having sufficient grade. We relaid 60' of this sewer line during the summer.

On October 20th, the Model 60 shovel was sent to the North Eddy Mine, just west of Hibbing, where it was engaged in loading out 19,419 tons of stockpile ore. This job was completed November 14th and the shovel returned to the Boeing Mine.

The Minnesota Power & Light Company made two changes in their transmission line across the Boeing Mine property during 1925. In May, they ran a new line from our transformer along the north boundary line of our property and dismantled the old line, which crossed our timber yard. We felt that this was necessary for safety purposes, for in the event that a fire should occur in our timber yard it would destroy this line and our power would be shut off. This change was made at our expense. The second alteration in their line was along the southeast corner

of our property and this was made necessary by caving operations at our East Deposit. This change was made at the Power Company's expense.

The open sewer ditch of the Village of Hibbing runs along the south side of our dump grounds for approximately three-quarters of a mile and for most of this distance, the toe of the dump extends close to the bank of the ditch. On account of the wash from heavy rains, a considerable accumulation of sand and gravel had been carried into the sewer ditch and the level of the water therein had been raised several feet in consequence. While the drainage on top of the dumps is diverted away from the ditch, there is no way to prevent the wash from the side of the banks. Upon the complaint of the Village authorities, we put two men at work in the sewer ditch and they were engaged here for three months cleaning out the accumulation of sand and gravel. The work satisfied the Village authorities. The Village Council is now contemplating a covered ditch for the disposal of their sewage and if this proposition is carried out, there should be no more expense to us in keeping the ditch open.

STOCKPILES

Loading was carried on at the Boeing stockpile intermittently from May 1st. to August 31st. This ore was shipped so as to maintain an average grade in our cargoes.

Following is the tonnage and analysis of the ore shipped from stockpile during 1925:

	TONS.	FE.	PHOS	SIL.	MN.	ALU.	MOIS.
Stockpile Shipments------	102,310	56.04	.081	10.25	.97	3.57	12.58

The sampling of the ore as it was placed in stock showed an analysis of 56.61% iron, as compared with 56.04% in loading, or a difference of .57%. We will give the question of sampling special attention this winter in an endeavor to secure results that will be borne out by our sampling when loading.

An overrun of 5,610 tons was realized in the loading out of our stockpile last season. This amounts to 5.6% and compares with an overrun of 6.6% for the previous year.

The new stocking trestles were put into service October 27th and we feel that sufficient space should be afforded to accommodate the tonnage that it will be necessary to place there up to May 1st., 1926.

BOEING MINE.

The tonnage and analysis of the ore in stock on January 1st., 1926 follows:

	TONS	FE.	PHOS	SIL.	MN.	ALU.
Boeing in Stock----------	31,613	55.78	.076	10.48	1.11	3.88

While we had been in hopes that we would be able to forward some of the sandy cretaceous ore, stocked to the south of the open pit, during 1925, the grade of the open pit ore mined was so low that we were unable to do this. We are in hopes of forwarding some ore from this stockpile during 1926, in the event that the open pit output holds up as well as, or better, than we expect.

The tonnage and analysis of this lean sandy stockpile is as follows:

	TONS	FE.	PHOS	SIL.	MN.	ALU.
Lean Ore----------	33,417	50.84	.101	17.74	--	5.91

Stocking operations were conducted on double shift from January 1st. to April 14th and from October 27th to December 31st.

UNDERGROUND OPERATIONS

Underground operations were carried on continuously during 1925. Although we had 16 contracts working during the year, our average force only amounted to 14½ gangs, as there was so much time lost by the men failing to report. In order to keep our mining force up, we employed on the average four stemmers, but even with this precaution, we were unable to realize a full operation much of the time. Labor conditions in the Hibbing District were quite satisfactory during 1925 and we had no difficulty in securing all the underground force that we needed.

The following table shows the output by months from our underground operations, the tons per miner and the tons per man, total payroll, during 1925:

MONTH	TONS PRODUCED	TONS PER MINER IN ORE	TOTAL TONS PER MAN
January-----	17,194	11.45	5.62
February----	16,879	12.21	5.58
March-------	18,024	11.87	5.76
April-------	17,090	11.58	5.57
May---------	18,435	11.87	6.33
June--------	18,409	11.64	6.21
July--------	17,840	11.77	6.02
August------	18,435	12.37	6.18
September---	15,183	10.59	5.23
October-----	15,271	10.48	4.92
November----	13,941	10.17	4.88
December----	15,102	10.06	5.03
S.P.Overrun-	5,610	---	--
TOTAL - 1925-	207,413	11.66	5.77
" - 1924-	187,436	10.28	5.12
DIFFERENCE---	19,977 Inc.	1.38 Inc.	.65 Inc.

The decrease in the monthly output, subsequent to August, is explained by the fact that the larger part of our mining force has been employed in the East Deposit, where the working conditions are much less favorable than in the West Deposit. We were working along the shore line in a number of places in the East Deposit with a low mining height and there has been considerable trouble encountered with sand runs. We feel that the water conditions are improving and that as the several gangs cave back from the shore line, that our results will show an improvement.

The pump sump was cleaned out at intervals throughout the year, but there was not nearly as much work done in this connection as during the two previous

years. The amount of water being pumped has decreased about 25% since the pit was stripped. Prior to the inauguration of mining activities in the East Deposit, practically all of the water pumped at the Boeing Mine came from the open pit, but at the present time fully 25% of the flow is encountered in the east end underground workings.

Comparatively little work was done on the main level during the past year, as the repairs undertaken in 1924 were so thorough. The water and sand conditions in the East Deposit has somewhat hampered our motor haulage and the wet condition of the ore from this deposit has interferred to some extent with top tram operations. There was comparatively little delay in our underground operations throughout 1925. Several hours were lost on the night shift of October 26th due to a bad sand run in the East Deposit, which blocked out main level and necessitated changing over from pocket shipping to stockpiling.

WEST DEPOSIT

1370' SUB-LEVEL:

Contract No. 1 was engaged until the middle of March in mining the pillars in the vicinity of No. 153 raise. The gang was then moved down to the next sub.

Nos. 2 and 3 spent the first six months of the year in slicing and caving back the ore at this elevation to the south of No. 155 raise. This was the last ore to be mined on this sub-level and when it was exhausted, the two gangs moved down to the next sub.

The pillars adjacent to No. 115 raise were mined by Nos. 5 and 9 by the middle of April and these two contracts then dropped down to the 1358' sub.

1358' SUB-LEVEL:

Contract No. 1 cut out at this elevation from No. 153 raise late in March and were engaged in mining and caving in this vicinity until July, when they dropped down to the next sub.

The development work and mining to the south of 155 raise has been undertaken by contracts Nos. 2 and 3 since they were transferred to this elevation in in July. These gangs have now caved back some distance from the south shore line and will be engaged for several additional months in exhausting the remaining pillars.

Contracts Nos. 5 and 9 cut out at this elevation from No. 115 raise in April and were engaged until December in mining the ore between this raise and the open pit face. The ore in this locality was exhausted in December and the two gangs dropped down to the 1346' sub.

Contract No. 6 finished caving and scramming in the neighborhood of No. 118 raise at this elevation early in February and moved down to the next sub.

No. 7 contract put up No. 116 raise from the main level to this elevation and were engaged until November in blocking out and mining the pillars in this vicinity. The gang then dropped down to the 1346' level.

No. 8 contract was engaged in mining along the west shore line to the south of No. 139 raise from April until July, when they were transferred to the East Deposit.

Contract No. 10 finished mining operations in the vicinity of No. 117 raise by the middle of April. They then dropped down in this raise and started development work on the next sub.

No. 11 was engaged in mining and scramming along the west shore line near 137 and 138 raises until September, when they were transferred to the East Deposit.

Contract No. 12 spent the first six months of the year exhausting the ore adjacent to No. 128 raise. They then dropped down to the 1346' sub.

No. 14 sliced and caved out the pillars around No. 136 raise by April. They were then transferred elsewhere.

Contract No. 15 spent the first four months of the year slicing and caving near 140 raise. They then dropped to the next sub.

Contract No. 16 exhausted the ore at this elevation in the vicinity of No. 135 raise early in March. They then dropped down to the next sub.

No. 17 operated a part of the month of April in slicing and caving out the pillars adjacent to No. 138 raise.

1346' SUB-LEVEL:

Contract No. 1 cut out from No. 153 raise at this elevation early in July. The gang developed pillars and then sliced them out, cleaning up the ore in this vicinity early in September, then being transferred to the East Deposit.

No. 2 contract spent the month of July in driving timber drifts between Nos. 140 and 153 raises, while No. 3 contract was exhausting the pillars to the south.

Contract No. 4, which had commenced development work North of No. 130 raise before the first of the year, continued mining and scramming along the west shore line in this locality until the forepart of June, when they were transferred to the East Deposit.

Nos. 5 and 9 contracts cut out at this elevation early in December from No. 115 raise and they are now engaged in blocking out the deposit between this raise and the open pit.

No. 6 developed and mined out the ore adjacent to No. 118 raise between February 10th and September 15th. The gang was then moved to the East Deposit.

Contract No. 7 started development work at this elevation early in November from No. 116 raise and they are now caving back along the open pit face.

Contract No. 8 exhausted the deposit in the vicinity of No. 119 raise early in March and were then transferred to the 1358' sub.

Contract No. 10 spent from April until the end of August in slicing and caving out a pillar at this elevation between the open pit face and the Susquehanna boundary line, dumping their product into No. 117 raise. The gang moved down to the next sub-level in this raise at the end of August.

No. 12 contract mined out the pillars to the north of Nos. 126, 127 and 128 raises from the forepart of March until the middle of October. They were then transferred to the East Deposit.

Contract No. 14 developed and mined out the ore in the immediate neighborhood of Nos. 136 and 137 raises, being engaged here during the months of May and June. The gang was then moved to the East Deposit.

Contract No. 15 was engaged in mining out the pillars and scramming in the vicinity of Nos. 140 and 151 raises from the first of June until December, when they were moved to the 1358' sub and are now assisting Nos. 2 and 3 in mining out the pillar under the open pit tail tracks.

No. 16 mined out the ore to the east and west of No. 135 raise, conducting their operations on top of the rock. The gang was engaged here from

the middle of March until the first of September, when they moved down to the main level below.

No. 17 was engaged in slicing out the pillars and caving back to the north of No. 129 raise from February until June, when they were transferred to the East Deposit.

1335' SUB-LEVEL:

Contract No. 10 cut out from No. 117 raise on top of rock at this elevation the latter part of August. The gang has developed the deposit between this raise and the open pit face and are now slicing and caving back. They encountered considerable rock in their development drift before they reached the edge of the open pit, where a test-pit had shown a good quality of ore to extend to this depth.

MAIN LEVEL:

Contract No. 16 started slicing back along the rock at the western extension of the ore channel early in September. They have worked out the deposit to within one set of the main tramming drift and they will shortly have secured all the ore to the north of this heading. No. 16 has used a scraper, operated by air, with very satisfactory results.

EAST DEPOSIT

1356' SUB-LEVEL:

The work of raising and developing this deposit was resumed in June, 1925. Operations were increased here from time to time and by January 1st. ten of our 18 contracts were employed in this deposit. No slicing activities along the pit face could be begun until open pit ore operations were concluded at the east end. During September, slicing operations were commenced along the open pit face, as well as along the north shore line.

Contract No. 1 started slicing between Nos. 174 and 176 raises in September. The ore here was hard and the back was quite high, retarding somewhat the progress of the operation. It was necessary to do considerable block-holing and sledging in order to reduce the chunks to the required size. Further than this, there was a considerable seepage of water and it was necessary to use precaution to prevent runs of sand. Since the middle of November this gang has been engaged in slicing back on top of the rock north of No. 174 raise.

No. 4 contract started drifting westerly from No. 174 raise in June. By the forepart of October they had reached the mining limit and crosscutted north to the shore line. This contract has encountered considerable difficulty with runs of sand and it has been necessary to leave some ground along their old workings and they are now slicing on the rock to the north.

Contract No. 6 moved to this deposit during September and they were engaged for the first month in slicing back from the pit face to the south from 176 raise. The gang then drifted to the north of No. 177 raise until the shore line was encountered and they have now started slicing back.

No. 8, since being moved to this deposit in June, have driven to the south from No. 184 raise and took a 20' slice along the south boundary line for a distance of approximately 300'. The object of this work was to break down the back and tap the water. The thought was that by bringing down the water along the limits of the workings, the bulk of the operations might be conducted with the minimum seepage from the back. Although the work done by No. 8 resulted in draining the deposit to some extent locally, there is still considerable seepage to the north and west. No. 8 is now engaged in slicing northward from the boundary workings.

Contract No. 11 was moved into No. 8's workings late in September and are attempting to mine out a sufficient area to bring down the capping along the south boundary line and aid in the draining situation. So far the gang has not succeeded in accomplishing very much along this line. No. 11 spent some time in handling the sand which flowed into their workings from time to time.

No. 12 contract began slicing operations to the north of No. 179 raise the middle of October. It was necessary for them to transfer their ore for the first six weeks that they operated, due to an abrupt raise in the rock and further than this, the gang was somewhat handicapped on account of a low mining height. During the night shift of October 26th, forty-eight hours after their room had been blasted in, a sand run occurred, which filled their drift with sand and boulders. As a result of this sand run, a considerable amount of material was washed into connecting drifts on either side and the main level was blocked for a distance of approximately 150' to their side of No. 179 raise. As a result of this sand run, no mining operations were conducted on the night

shift of October 26th and we were obliged to resume stocking operations so that the washed material could be dumped into and handled through our shipping pocket. The main level was practically cleaned up and all but two of the gangs resumed operations in their working places the following day. It was, however, two weeks before No. 12 had their tramway cleaned and could resume mining activities. No. 12 spent the balance of the year in slicing back in this territory and on December 30th another run occurred, which will take several days to clean up.

No. 14 contract spent July, August and September in putting up Nos. 177 and 179 raises and they have been engaged the balance of the year in driving to the south boundary line from these raises, a distance of 200' in each case.

Contract No. 17 pushed a drift to the north along the west boundary line from June until the first of October. A 10' pillar was left along the line, with the intention of slicing this out later, if it were feasible. We were very apprehensive that a cave-in along this line would endanger our roadway, the only means we have of getting into the property. No. 17 did slice out a room two sets wide for a distance of 200' along the south end of their drift. The idea here was to tap the water and reduce the seepage over the rest of the workings. The north part of the boundary workings will be left until we feel sure that the mining and caving of the deposit here would not endanger our roadway.

Contract No. 18 started driving north from 179 raise the latter part of November and were engaged here at the end of the year.

No. 19 contract started slicing operations on top of rock to the north of 180 raise the middle of December.

On December 11th, a sand run occurred along the boundary line to the east of No. 184 raise, which filled the adjacent crosscuts and some material was washed down onto the main level. As a result of this sand run a settlement occurred on the surface. Considerable water is now flowing from this area and we are not apprehensive of any further runs unless the water becomes blocked. We do not contemplate any further slicing operations along the south or east boundaries at this time, as the water has been pretty well tapped and we feel that we can follow out our mining program without serious trouble from sand runs.

In all cases where we have a sub below us, the rooms are covered down with poles, lagging and covering boards. This provides an opening under the

caved ground for the water to flow freely and will provide a good mat for operations on the sub below.

OPEN PIT ORE OPERATIONS

Operations in the open pit were started on April 13th. Several wash-outs, which had occurred under the tracks during the spring break-up were filled and ballasted and a part of the main line near the coal dock was rebuilt. A small revolving shovel was rented from a Duluth contractor and this machine was used in digging a casting cut along the underground workings at the west end of the pit. Mining operations had caved the ground here and it was necessary to place material for our tail track. This machine was taken from the pit on May 14th and later returned to the owner.

The pit tracks were ready for ore loading by the latter part of April and shipments started on the 30th. The last ore loading for the season was completed on November 19th.

The open pit ore produced by months and the analysis of same follows:

MONTH:	TONS.	FE.	PHOS	SIL.	MN.	ALU.	MOIS.
April----------	1,200	53.28	.085	8.71	1.15	6.17	--
May----------	48,996	55.60	.079	7.59	.57	6.76	14.37
June----------	40,621	54.08	.084	9.70	.92	4.99	16.81
July----------	41,335	53.46	.077	11.99	.87	3.77	16.25
August----------	39,400	53.65	.076	12.42	.72	4.27	16.09
September----------	49,143	54.11	.071	12.03	1.09	3.44	16.00
October----------	56,410	55.61	.074	12.77	.65	2.97	15.59
November----------	13,955	55.83	.088	11.86	.52	3.70	13.69
TOTAL, ----------	291,060	54.57	.077	11.12	.79	4.31	15.69

The average grade of ore secured from open pit operations was quite disappointing. Our test-pitting and churn drilling indicated a better grade than we secured. The material encountered in the bottom of the cuts at the east end of the pit were particularly disappointing and it was this second class ore that was largely instrumental in causing the grade to run off to such an extent.

We feel that the grade of ore to be secured from the open pit in 1926 will show an appreciably higher iron content, as well as lower silica and lower alumina.

The first cut of the 350-ton shovel was taken along the south bank of the pit at the east end and was completed May 14th. This cut removed a wedge shaped piece of ore and allowed us to get to the extreme east end of the pit and

attack the ore face along the Sargent boundary. It had been our intention to clean up the material sloughed into the bottom of the pit when this first cut was completed, but it was impossible to take care of the drainage situation so as to do this. The shovel was moved westward, digging along the south bank and taking all the material possible along the Sargent boundary.

On May 19th, the Model 60 Marion shovel was taken into the pit and was engaged for the balance of that month in cleaning sloughed material on top of the ore ahead of the large machine. During the first two weeks of June, the 60 shovel was engaged in cutting a track bench along the face of the ore cut, so that cars could be spotted in the bottom of the pit for the loading out of the deepest ore.

The 350-ton shovel continued operating to the westward along the south bank until June 26th, when it was turned around and started digging down the bottom toward the east. The ore encountered in this bottom cut was much inferior to what we had anticipated from the test-pitting and drill holes. Seams of rock were encountered and had to be sorted out and many large chunks of hard material had to be blockholed and reduced. There was considerable delay to the operation while we were taking this sinking cut.

As the bottom ore cut at the east end of the pit was considerably below our main level, the handling of the water was quite a problem. Launders were built around the toe of the stripping bank and as much of the flow as possible was caught in these launders by the use of pipes and small cross launders, leading out from the bank. The water was carried around in the main launder to the main level through stand pipes. The relatively small amount of seepage from the pit ore itself was handled by a small steam pump, which was hung under the big shovel. To safeguard our open pit operations, while we were engaged in loading ore below the elevation of the main level, from being flooded by cloudbursts, or breaks in the launders, two electric centrifugal pumps were installed on a scow. This scow floated and could have taken care of any sudden heavy flow into the pit, had one occurred. If it had not been for this arrangement, we would have had very serious difficulty, as a cloudburst occurred one night that filled the pit bottom and would have delayed us for some time, if we did not have this equipment with which to pump it out rapidly.

The amount of ore that we secured in the bottom at the east end of the pit was considerably less than we had contemplated. This was due to our encountering rock along the north side of the cut, where our drilling and test-pitting had indicated merchantable ore. The mining of the deep ore was completed by the middle of September, when the shovel was moved westward, cutting along the south bank of the pit. In the vicinity of No. 6 main level crosscut, the rock was found to roll much higher than we had figured on. As a result the shovel had to climb over this rock and there was a further decrease in the ore tonnage from our estimate. A dam of waste material was made by a cast on top of the rock. This was done to keep the surface wash from going onto the cleaned out portion of the pit to the west. During the balance of the season, the large shovel cut along the south bank and when operations were concluded, it was located to the west of the shaft.

A Cyclone drill was rented from the Winston-Dear Company in June and a number of holes were put down ahead of the shovel and blasted. The shaking of the bank materially benefitted the shovel operations and in July a Cyclone drill was purchased from the Mesabi Iron Company. Drilling operations were conducted off and on during the balance of the season, with satisfactory results.

Ore loading had to be suspended at several times during the summer in order to clean up surface material that had washed into the pit. Fortunately these delays were not very serious, as they seemed to occur when we had a large dock balance and the Great Northern Railway Company would not furnish us an adequate car supply. During the latter part of October and November, the weather was quite severe at times and the Great Northern Company would not supply us with cars unless the boats were in dock to take the ore. In consequence of this, we had to suspend operations seven days in October and 10 days in November. For the most part, the crews were sent home when we were forced to suspend work, but some repair work was done on the shovel, locomotives and tracks.

The delay on account of not being furnished cars only amounted to 62½ hours during 1925, with the exception of the time we were shut down on account of the severe weather and not having a boat in dock. During 1924 we suffered delays of 99½ hours from this cause.

BOEING MINE.

During October operations, rock was encountered in the bottom of the ore cut and it was necessary for the shovel to climb up on quite a grade. Such rock as it was necessary to handle was sorted out and piled in the middle of the cut behind the shovel.

During the latter part of November, the 350-ton machine climbed up on the ore and when ore loading was completed, the machine was ready for clean-up work on top of the ore along the south toe of the stripping bank. The Model 60 shovel was brought into the pit on November 24th and was engaged until December 3rd in digging a new tail track bench at a lower elevation than the old one. Early in December one locomotive and sixteen stripping cars were secured from the Hill-Trumbull Mine. The entire old lower track bench for a distance of 1,000', was dug out by the large shovel during December, the material being loaded into stripping cars on the upper approach track and taken to the dump. This job was very nearly completed, but on account of the very severe weather and the wet condition of the bank, it was decided advisable to shut down the work and complete the job next spring.

ACCIDENTS

Following is a list of the accidents which occurred at the Boeing Mine during 1925 and were of a serious enough nature to require the payment of compensation:

JACK SHICKICH

Injured---------- January 26th, 1925.
Occupation---------- Miner.
Nationality---------- Croatian.
Time Lost---------- 18 Days.
Compensation Paid---------- $40.00.

Remarks: Shickich fell on a pile of lagging and struck his left knee in such a manner as to cause an abrasion on the outer side.

CARL ASICH

Injured---------- February 22nd, 1925.
Occupation---------- Miner.
Nationality---------- Croatian.
Time Lost---------- 13 Days.
Compensation Paid---------- $23.33.

Remarks: In placing support in mine water ditch under Great Northern tracks, Asich caught his finger between two pieces of rail, resulting in squeezing the end of middle finger of right hand.

PAUL MILLER

Injured---------- February 27th, 1925.
Occupation---------- Miner.
Nationality---------- Finnish.
Time Lost---------- 8 Days.
Compensation Paid---------- $6.67.

Remarks: While Miller was engaged in sawing a piece of lagging, the saw jumped and the teeth passed over his left hand, causing several cuts on his index finger.

GEORGE MILLER

Injured---------- March 14th, 1925.
Occupation---------- Miner.
Nationality---------- Austrian.
Time Lost---------- 43 Days.
Compensation Paid---------- $146.67.

Remarks: While Miller was walking into his working place, he slipped and fell on the tramming track in such a manner as to cause a bruise and sprain of his right side.

PETER BOOS

Injured---------- March 20th, 1925.
Occupation---------- Timber Trammer.
Nationality----------German.
Time Lost---------- 19 Days.
Compensation Paid---------- $37.27.

Remarks: Boss was engaged in piling timber at the bottom of a raise and was using a hook to pull it away from the raise. A piece of timber slipped and struck him on the right ankle, causing a severe bruise.

CHARLES MATTI

Injured----------April 1st., 1925.
Occupation----------Miner.
Nationality----------Finnish.
Time Lost----------9½ Days.
Compensation Paid----------$13.33.

Remarks: A small chunk of ore fell from the side of his drift and struck him on the side of the head, causing a slight cut on the scalp.

VETO LAMPUGANO

Injured----------April 9th, 1925.
Occupation----------Timber Trammer.
Nationality----------Italian.
Time Lost----------32½ Days.
Compensation Paid----------$94.60.

Remarks: Lampugano was handling timber with a tugger hoist. He attempted to guide the cable onto the drum with his left hand and caught his hand under the cable. He suffered a fracture of the fingers of his left hand.

MIKE CHOVEK

Injured----------April 13th, 1925.
Occupation----------Miner.
Nationality----------Austrian.
Time Lost----------17 Days.
Compensation Paid----------$40.00.

Remarks: An underground locomotive was being used to hoist timber in Chovek's raise. A piece of timber stuck at the top of the raise and while Chovek was attempting to pry it loose with a piece of lagging, the locomotive gave a pull, breaking the 3/4" hemp rope and allowing the timber to fall onto Chovek's left foot. He suffered a fracture of the terminal phalangeal bones of the 4th and 5th toes.

ISAAC PEINOVICH

Injured----------May 16th, 1925.
Occupation----------Miner.
Nationality----------Jugo-Slavian.
Time Lost----------18 Days.
Compensation Paid----------$40.00.

Remarks: Peinovich was operating a Mayne loader, when his hands were caught between the operating lever and a drift post. His left hand was badly squeezed and he suffered a fracture of the phalangeal bone of the index finger of his right hand.

LEO PAPPILA

Injured----------May 22nd, 1925.
Occupation----------Miner.
Nationality----------Finnish.
Time Lost----------16 Days.
Compensation Paid----------$33.33.

Remarks: While shoveling ore into a tram car, some chunks of ore fell from the side of Pappila's working place and struck his right leg. He suffered two cuts which extended to the bone and his leg was otherwise badly bruised.

SIDNEY KEMP

Injured---------- July 30th, 1925.
Occupation---------- Steam Shovel Oiler.
Nationality---------- American.
Time Lost---------- Still Off.
Compensation Paid---------- $436.67 to Dec. 31st.

Remarks: Kemp, who was employed an an oiler on the Model 350-ton shovel, had climbed up on the boom to oil the two sheaves. These sheaves were located on the same shaft, hub to hub, and revolve in the same direction, one moving much slower than the other. Kemp was standing on the right side of the boom and attempted to oil the sheave on the left side by sticking his right arm through the spokes of both wheels. The engineer did not know that Kemp was engaged in this work and started to operate the shovel. Kemp suffered a fracture of the ulna and radius of the right arm. This accident was due entirely to Kemp's carelessness and he disobeyed rules.

CHARLES BISSONNETTE

Injured---------- August 12th, 1925.
Occupation---------- Underground Pumpman.
Nationality---------- American.
Time Lost---------- 13 Days.
Compensation Paid---------- $16.67.

Remarks: While Bissonnette was working on a pump, he slipped and fell from a step ladder and suffered a sprain of his right ankle. There was considerable swelling and some ecclupnosis.

PETER MARICICH

Injured---------- October 6th, 1925.
Occupation---------- Miner.
Nationality---------- Serbian.
Time Lost---------- 16 Days.
Compensation Paid---------- $33.33.

Remarks: Maricich was landing timber at the top of his raise when a piece rolled on his left foot, causing a severe bruise and slight ecclupnosis.

JOHN HILL

Injured---------- October 7th, 1925.
Occupation---------- Timber Trammer.
Nationality---------- Finnish.
Time Lost---------- 15 Days.
Compensation Paid---------- $25.80.

Remarks: While Hill was engaged in pulling poles from a pile of timber that had been dumped down a raise, a piece of timber rolled over and struck his foot, causing a severe bruise of his right ankle.

MIKE HORAN

Injured---------- October 22nd, 1925.
Occupation---------- Pit Laborer.
Nationality---------- American.
Time Lost---------- 54 Days.
Compensation Paid---------- $156.80.

Remarks: While Horan was engaged in salvaging timber from the old launders at the east end of the pit, a 12" boulder rolled from the bank and struck him on the back. He suffered a fracture of the 9th and 10th ribs, besides being badly bruised.

EMIL RIMMI

Injured---------- October 19th, 1925.
Occupation---------- Timberman.
Nationality---------- Finnish.
Time Lost---------- 11 Days.
Compensation Paid---------- $16.53.

Remarks: While Rimmi was engaged in landing timber at the top of his raise, he dropped a piece on his left foot and suffered a fracture of the distal bone of the first toe of his left foot.

PAUL DAVICH

Injured---------- October 28th, 1925.
Occupation---------- Miner.
Nationality---------- Austrian.
Time Lost---------- 22 Days.
Compensation Paid---------- $53.33.

Remarks: While Davich and his partner were engaged in mining the last of the ore over their raise, he stepped onto the poles which covered the raise, to cut a fuse. The poles rolled under him and his knife slipped and afflicted a deep cut on the anterior surface of his right wrist.

CARL ASICH

Injured---------- October 27th, 1925.
Occupation---------- Miner.
Nationality---------- Croatian.
Time Lost---------- 12½ Days.
Compensation Paid---------- $20.72.

Remarks: While tramming with a loaded timber truck, Asich squeezed his hand between the truck and a drift post. He suffered several bruises of the left hand over the first and second metacarpal-carpal joints.

ANDREW SENKOVICH

Injured---------- October 21st., 1925.
Occupation---------- Steam Shovel Oiler.
Nationality---------- American.
Time Lost---------- 14 Days.
Compensation Paid---------- $20.00.

Remarks: Senkovich was oiling the boom engine while it was in motion and he caught the thumb of his right hand in such a way as to cause a fracture and some crushing of the end of the thumb.

ATTILIO CHIARNUCCI

Injured---------- November 6th, 1925.
Occupation---------- Motor Brakeman.
Nationality---------- Italian.
Time Lost---------- 9 Days.
Compensation Paid---------- $8.64.

Remarks: While he was loading a car of dirt near his chute, Chiarnucci slipped and fell against the handle of the chute stopper. He suffered a severe bruise of his right side, especially in the neighborhood of his 6th rib.

TONY WOLF

Injured----------November 27th, 1925.
Occupation----------Blaster.
Nationality----------Russian.
Time Lost----------9 Days.
Compensation Paid----------$9.20.

Remarks: While he was engaged in loading ties onto a flat car, Wolf fell from the car to the ground, striking on his left foot in such a manner as to break the terminal phalangeal bone of his left great toe.

GEORGE MAURIN

Injured----------March 1st., 1925.
Occupation----------Locomotive Engineer.
Nationality----------American.
Time Lost----------Still Off.
Compensation Paid----------$136.67 to Dec. 31st.

Remarks: Maurin was assisting to place the hoisting chain on the No. 20 shovel. He slipped on the roof of the shovel and sprained himself in such a manner as to cause a right inguinal hernia.

ARTHUR KOSKI

Injured----------December 8th, 1925.
Occupation----------Steam Shovel Pitman.
Nationality----------Finnish.
Time Lost----------8 Days.
Compensation Paid----------$6.67.

Remarks: While Koski was pulling out drain plugs on shovel No. 28, the engineer moved the machine and Koski slipped and fell to the ground. While there were no apparent bruises or swelling, he claims he suffered severe pains in the lower left side of his abdomen. No hernia condition was found.

PETER STANICH

Injured----------December 8th, 1925.
Occupation----------Miner.
Nationality----------Montenegrin.
Time Lost----------19 Days.
Compensation Paid----------$42.33.

Remarks: While he was making room for back poles, a chunk of ore loosened and fell from the back and struck Stanich on the right leg, causing a severe bruise.

SHIPMENTS

Following are the cargoes of straight Boeing ore shipped during the 1925 season and the analysis of same as obtained at the Mine and by the Lower Lake Chemists:

MUNISING	4/29/25						5,809 Tons.
	FE.	PHOS	SIL.	ALU.	MOIS.	FE.NAT.	
Mine	56.12	.078	10.61	3.07	12.89	-----	
Cremer & Case	56.50	---	----	----	13.32	48.97	
ANGELINE	5/5/24						6,054 Tons.
Mine	55.34	.078	9.67	4.71	13.84	-----	
Hughes-Guentzler	55.75	----	----	----	14.30	47.78	
MICHIGAN	5/6/25						3,358 Tons.
Mine	55.80	.077	9.47	4.15	13.60	-----	
Crowell & Murray	55.70	---	----	----	13.20	48.35	
GRAND ISLAND	5/8/25						7,615 Tons.
Mine	55.62	.078	9.26	5.03	13.91	-----	
Oscar Textor	55.50	---	----	----	13.13	48.21	
ISHPEMING	5/10/25						9,346 Tons.
Mine	56.32	.077	8.56	4.90	13.38	-----	
Cremer & Case	56.10	---	----	----	13.24	48.67	
W. E. FITZGERALD	5/12/25						6,791 Tons.
Mine	56.41	.076	8.38	4.96	13.37	-----	
Crowell & Murray	56.40	---	----	----	12.57	49.31	
THOS. BRITT	5/13/25						5,754 Tons.
Mine	56.92	.077	8.12	4.90	12.45	-----	
Oscar Textor	56.60	---	----	----	13.02	49.23	
YOSEMITE	5/18/25						5,429 Tons.
Mine	56.71	.079	7.86	5.14	12.81	-----	
Hughes-Guentzler	56.73	---	----	----	13.92	48.83	
PIONEER	5/20/25						8,603 Tons.
Mine	56.60	.076	8.22	5.23	12.86	-----	
Cremer & Case	56.70	---	----	----	13.04	49.31	
W. E. FITZGERALD	5/24/25						6,711 Tons.
Mine	56.35	.078	8.35	5.24	12.81	-----	
Oscar Textor	56.30	---	----	----	12.04	49.52	
CADILLAC	5/26/25						5,742 Tons.
Mine	56.00	.076	8.58	5.31	12.37	-----	
Hughes-Guentzler	55.95	---	----	----	13.51	48.39	

W. H. WOLF- - - - - - - - - - - - - - - - 5/26/25 - - - - - - - - - - - - 8,883 Tons.

	FE.	PHOS	SIL.	ALU.	MOIS.	FE.NAT.
Mine	55.89	.076	8.97	5.66	12.80	-----
Oscar Textor	56.10	---	----	----	13.13	48.73

PIONEER- - - - - - - - - - - - - - - - - 5/29/25 - - - - - - - - - - - - 8,694 Tons.

Mine	55.53	.078	9.67	5.00	13.65	-----
Crowell & Murray	55.41	---	----	----	14.93	47.14

MARQUETTE- - - - - - - - - - - - - - - - 6/2/25 - - - - - - - - - - - - 6,782 Tons.

Mine	55.44	.083	9.25	4.56	14.06	-----
Cremer & Case	55.10	---	----	----	13.97	47.40

SAMUEL SQUIRE- - - - - - - - - - - - - - 6/5/25 - - - - - - - - - - - - 6,436 Tons.

Mine	55.20	.086	9.72	4.60	14.24	-----
Oscar Textor	55.30	---	----	----	13.75	47.70

PIONEER- - - - - - - - - - - - - - - - - 6/6/25 - - - - - - - - - - - - 8,404 Tons.

Mine	54.89	.088	9.56	4.70	14.97	-----
Cremer & Case	54.65	---	----	----	15.65	46.32

CADILLAC- - - - - - - - - - - - - - - - -6/7/25 - - - - - - - - - - - - 5,791 Tons.

Mine	54.71	.088	9.90	4.80	14.88	-----
Hughes-Guentzler	55.00	---	----	----	14.93	46.79

GRAND ISLAND- - - - - - - - - - - - - - -6/12/25 - - - - - - - - - - - - 7,994 Tons.

Mine	54.88	.081	9.73	4.62	15.07	-----
Oscar Textor	55.55	---	----	----	14.16	47.68

W. E. FITZGERALD- - - - - - - - - - - - -6/14/25 - - - - - - - - - - - - 6,713 Tons.

Mine	55.19	.083	9.65	4.71	14.58	-----
Crowell & Murray	55.50	---	----	----	14.37	47.53

YOSEMITE- - - - - - - - - - - - - - - - -6/15/25 - - - - - - - - - - - - 5,306 Tons.

Mine	55.60	.080	9.65	4.04	14.70	-----
Hughes-Guentzler	55.67	---	----	----	14.73	47.40

ANGELINE- - - - - - - - - - - - - - - - -6/17/25 - - - - - - - - - - - - 6,240 Tons.

Mine	54.97	.080	9.94	4.22	14.65	------
Cremer & Case	55.60	---	----	----	13.97	47.83

PETER WHITE- - - - - - - - - - - - - - - 6/18/25 - - - - - - - - - - - - 8,451 Tons.

Mine	55.09	.081	9.89	4.56	14.88	-----
Hughes-Guentzler	55.50	---	----	----	14.33	47.55

PIONEER- - - - - - - - - - - - - - - - - 6/21/25 - - - - - - - - - - - - 8,706 Tons.

Mine	55.11	.081	10.05	4.18	14.51	-----
Oscar Textor	55.75	---	-----	----	14.02	47.93

GRAND ISLAND- - - - - - - - - - - - - - - 6/27/25- - - - - - - - - - - - 7,849 Tons.

Mine	55.18	.079	10.09	4.14	14.34	-----
Crowell & Murray	56.60	---	-----	----	13.91	48.73

BOEING MINE.

MARQUETTE- - - - - - - - - - - - - - - - - 6/28/25 - - - - - - - - - - 6,675 Tons.

	FE.	PHOS	SIL.	ALU.	MOIS.	FE.NAT.
Mine----------	55.29	.078	10.14	4.06	14.55	-----
Cremer & Case----------	55.20	---	-----	----	15.04	46.90

PIONEER- - - - - - - - - - - - - - - - - - 6/30/25 - - - - - - - - - - 8,566 Tons.

Mine----------	55.07	.082	10.02	4.04	14.94	-----
Cremer & Case----------	55.30	---	-----	----	14.42	47.33

ANGELINE- - - - - - - - - - - - - - - - - -7/3/25 - - - - - - - - - - - 6,220 Tons.

Mine----------	55.43	.077	9.71	3.77	14.36	-----
Oscar Textor----------	55.75	---	----	----	15.12	47.32

W. H. WOLF- - - - - - - - - - - - - - - - - 7/5/25- - - - - - - - - - - - 9,139 Tons.

Mine----------	55.04	.080	11.09	3.46	14.86	-----
Oscar Textor----------	56.20	---	-----	----	13.40	48.67

D. E. CALLENDER- - - - - - - - - - - - - -7/8/25 - - - - - - - - - - - - 4,748 Tons.

Mine----------	54.54	.076	11.72	3.47	13.77	-----
Crowell & Murray--------	55.40	---	-----	----	14.40	47.42

PIONEER- - - - - - - - - - - - - - - - - - 7/11/25 - - - - - - - - - - - 8,782 Tons.

Mine----------	54.87	.076	11.50	3.45	14.24	-----
Hughes-Guentzler--------	55.65	---	-----	----	13.40	48.19

J. H. SHEADLE- - - - - - - - - - - - - - 7/12/25 - - - - - - - - - - - - 9,415 Tons.

Mine----------	55.16	.081	10.53	3.68	14.25	-----
Crowell & Murray--------	55.63	---	-----	----	14.71	47.45

PANAY- - - - - - - - - - - - - - - - - - 7/16/25 - - - - - - - - - - - - 5,354 Tons.

Mine----------	54.83	.080	10.37	3.73	13.92	-----
Hughes-Guentzler--------	54.73	---	-----	----	14.35	46.88

GRAND ISLAND- - - - - - - - - - - - - - 7/16/25 - - - - - - - - - - - - 7,869 Tons.

Mine----------	54.95	.079	10.47	3.71	13.69	-----
Crowell & Murray--------	56.22	---	-----	----	13.75	48.49

MARQUETTE- - - - - - - - - - - - - - - - - 7/18/25 - - - - - - - - - - - - 6,702 Tons.

Mine----------	54.41	.075	11.03	3.65	14.20	-----
Cremer & Case----------	54.60	---	-----	----	13.47	47.24

W. A. AMBERG- - - - - - - - - - - - - - - -7/23/25 - - - - - - - - - - - - 3,250 Tons.

Mine----------	54.70	.075	11.72	3.56	13.74	-----
Cremer & Case----------	53.80	---	-----	----	12.86	46.88

GRAND ISLAND- - - - - - - - - - - - - - -7/26/25 - - - - - - - - - - - - 8,023 Tons.

Mine----------	54.65	.074	10.85	3.83	13.82	-----
Oscar Textor----------	55.20	---	-----	----	12.90	48.08

ISHPEMING- - - - - - - - - - - - - - - - - 7/26/25 - - - - - - - - - - - - 3,106 Tons.

Mine----------	54.78	.078	11.52	3.75	13.68	-----
Hughes-Guentzler--------	54.75	---	-----	----	14.66	46.72

BOEING MINE.

PETER WHITE- - - - - - - - - - - - - - - 7/27/25- - - - - - - - - - - - - 8,581 Tons.

	FE.	PHOS	SIL.	ALU.	MOIS.	FE.NAT.
Mine----------	55.15	.078	10.74	3.90	14.26	-----
Hughes-Guentzler----------	55.35	---	-----	----	14.40	47.38

MARQUETTE- - - - - - - - - - - - - - - - 8/1/25 - - - - - - - - - - - - - 6,733 Tons.

Mine----------	55.27	.077	10.72	3.68	14.48	-----
Crowell & Murray----------	56.08	---	-----	----	14.60	47.89

PANAY- - - - - - - - - - - - - - - - - - 8/3/25 - - - - - - - - - - - - - 5,305 Tons.

Mine----------	54.94	.077	11.12	3.77	14.74	-----
Oscar Textor----------	55.95	---	-----	----	13.05	48.65

W. H. WOLF- - - - - - - - - - - - - - - - 8/8/25- - - - - - - - - - - - - 8,895 Tons.

Mine----------	55.58	.082	9.88	4.03	14.26	-----
Cremer & Case----------	55.50	---	----	----	13.54	47.99

J. H. SHEADLE- - - - - - - - - - - - - - 8/9/25- - - - - - - - - - - - - - 9,392 Tons.

Mine----------	55.42	.084	10.28	4.18	13.66	-----
Crowell & Murray----------	55.63	---	-----	----	13.96	47.86

PIONEER- - - - - - - - - - - - - - - - - 8/13/25- - - - - - - - - - - - 8,742 Tons.

Mine----------	55.03	.082	10.79	3.91	14.29	-----
Oscar Textor----------	55.18	----	-----	----	13.34	47.82

NEGAUNEE- - - - - - - - - - - - - - - - - 8/16/25- - - - - - - - - - - - 5,700 Tons.

Mine----------	54.41	.077	10.96	4.14	14.94	-----
Hughes-Guentzler----------	54.20	---	-----	----	14.73	46.22

CADILLAC- - - - - - - - - - - - - - - - - 8/21/25 - - - - - - - - - - - 5,940 Tons.

Mine----------	54.65	.074	11.17	4.31	14.28	-----
Oscar Textor----------	54.40	---	-----	----	13.97	46.80

GRAND ISLAND- - - - - - - - - - - - - - - 8/22/25 - - - - - - - - - - - 7,885 Tons.

Mine----------	54.63	.072	11.65	4.23	14.75	-----
Crowell & Murray----------	54.81	---	-----	----	14.16	47.05

FRONTENAC- - - - - - - - - - - - - - - - - 8/25/25 - - - - - - - - - - - 5,287 Tons.

Mine----------	54.73	.072	11.33	4.08	14.56	-----
Cremer & Case----------	54.60	---	-----	----	14.18	46.86

PIONEER- - - - - - - - - - - - - - - - - - 8/28/25 - - - - - - - - - - - 8,674 Tons.

Mine----------	54.55	.074	11.61	3.82	14.93	-----
Hughes-Guentzler----------	54.45	---	-----	----	14.13	46.76

W. H. WOLF- - - - - - - - - - - - - - - - -8/30/25 - - - - - - - - - - - 8,840 Tons.

Mine----------	54.07	.076	12.14	3.63	15.38	-----
Cremer & Case----------	54.60	----	-----	----	13.35	47.31

CADILLAC- - - - - - - - - - - - - - - - - -9/2/25- - - - - - - - - - - - 5,881 Tons.

Mine----------	54.63	.075	11.99	3.70	15.15	-----
Crowell & Murray----------	54.85	---	-----	----	14.76	46.75

BOEING MINE.

GRAND ISLAND- - - - - - - - - - - - - - - 9/6/25 - - - - - - - - - - 7,998 Tons.

	FE.	PHOS	SIL.	ALU.	MOIS.	FE.NAT.
Mine	53.96	.073	11.90	3.57	14.64	-----
Oscar Textor	53.45	---	-----	----	14.16	45.88

PIONEER- - - - - - - - - - - - - - - - 9/26/25 - - - - - - - - - - 8,678 Tons.

Mine	55.09	.080	9.86	----	15.81	-----
Oscar Textor	54.80	---	----	----	15.10	46.52

ANGELINE- - - - - - - - - - - - - - - - -9/30/25 - - - - - - - - - - 3,556 Tons.

Mine	55.23	.072	11.09	3.84	14.91	-----
Cremer & Case	55.45	---	-----	----	16.04	46.56

GRAND ISLAND- - - - - - - - - - - - - - -9/30/25 - - - - - - - - - - 7,896 Tons.

Mine	55.23	.075	10.80	3.83	15.17	-----
Crowell & Murray	56.51	---	-----	----	16.51	47.18

COLONEL- - - - - - - - - - - - - - - - -10/3/25- - - - - - - - - - 5,595 Tons.

Mine	54.94	.072	12.54	3.11	15.33	-----
Hughes-Guentzler	55.07	---	-----	----	15.30	46.64

MUNISING- - - - - - - - - - - - - - - -10/4/25 - - - - - - - - - - 5,825 Tons.

Mine	55.08	.077	12.23	3.73	15.03	-----
Oscar Textor	55.25	---	-----	----	14.10	47.46

PIONEER- - - - - - - - - - - - - - - - -10/6/25- - - - - - - - - - 8,768 Tons.

Mine	54.95	.072	12.96	3.48	15.85	-----
Cremer & Case	55.25	---	-----	----	15.54	46.66

GRAND ISLAND- - - - - - - - - - - - - - -10/13/25 - - - - - - - - - 7,814 Tons.

Mine	54.66	.074	13.29	3.26	15.50	-----
Crowell & Murray	55.85	---	-----	----	14.84	47.56

PIONEER- - - - - - - - - - - - - - - - - 10/15/25 - - - - - - - - - 8,571 Tons.

Mine	55.31	.072	12.76	3.00	15.84	-----
Oscar Textor	55.55	---	-----	----	14.56	47.46

ANGELINE- - - - - - - - - - - - - - - - 10/18/25 - - - - - - - - - - 6,157 Tons.

Mine	55.61	.071	12.74	2.89	15.07	-----
Cremer & Case	55.60	---	-----	----	14.45	47.56

FRONTENAC- - - - - - - - - - - - - - - -10/18/25- - - - - - - - - - 10,511 Tons.

Mine	55.59	.069	12.25	3.04	15.56	-----
Crowell & Murray	56.52	---	-----	----	14.31	48.43

C. W. WATSON- - - - - - - - - - - - - - - 10/19/25- - - - - - - - - - 5,860 Tons.

Mine	56.12	.080	11.76	2.93	14.97	-----
Hughes-Guentzler	56.80	---	-----	----	13.34	49.22

PIONEER- - - - - - - - - - - - - - - - -10/24/25 - - - - - - - - - - 8,653 Tons.

Mine	56.08	.083	11.30	3.25	14.77	-----
Cremer & Case	56.70	---	-----	-----	14.09	48.71

BOEING MINE.

The following cargoes, shipped as Boeing Grade, are made up of 10,415 tons of Hill Direct and 30,972 tons of Boeing:

PETER WHITE- - - - - - - - - - - - -9/6/25 - - - - - - - - - - - - - - 2,522 Tons.

	FE.	PHOS	SIL.	ALU.	MOIS.	FE.NAT.
Mine----------	55.12	.063	11.24	----	13.14	-----
Crowell & Murray---------	56.10	---	-----	----	13.30	48.64

PIONEER- - - - - - - - - - - - - - -9/7/25 - - - - - - - - - - - - - - 8,846 Tons.

Mine----------	55.16	.061	11.87	----	12.75	-----
Crowell & Murray---------	57.01	---	-----	----	13.64	49.23

MICHIGAN- - - - - - - - - - - - - - - 9/15/25- - - - - - - - - - - - - - 9,410 Tons.

Mine----------	55.40	.063	11.90	----	12.21	-----
Hughes-Guentzler---------	54.90	---	-----	----	11.97	48.33

PIONEER- - - - - - - - - - - - - - - -9/16/25- - - - - - - - - - - - - - 8,811 Tons.

Mine----------	55.07	.065	11.80	----	11.98	-----
Hughes-Guentzler---------	56.27	---	-----	----	10.40	50.42

FRONTENAC- - - - - - - - - - - - - -9/21/25- - - - - - - - - - - - - - 5,496 Tons.

Mine----------	55.22	.073	11.09	----	12.91	-----
Oscar Textor----------	55.35	---	-----	----	14.44	47.35

PENOBSCOT- - - - - - - - - - - - - -9/23/25- - - - - - - - - - - - - - 6,302 Tons.

Mine----------	55.24	.072	9.91	----	14.13	-----
Cremer & Case----------	55.40	---	----	----	12.52	48.46

The following cargoes, shipped as Boeing Grade, are made up of 19,419 tons of North Eddy stockpile ore and 25,932 tons of Boeing ore:

CADILLAC- - - - - - - - - - - -10/25/25- - - - - - - - - - - - - - 4,553 Tons.

	FE.	PHOS	SIL.	ALU.	MOIS.	FE.NAT.
Mine----------	53.87	.075	12.64	2.82	13.33	-----
Oscar Textor----------	54.45	---	-----	----	11.21	48.35

MARQUETTE- - - - - - - - - - - - - 10/26/25- - - - - - - - - - - - - - 6,548 Tons.

Mine----------	54.74	.080	12.18	2.88	13.25	-----
Crowell & Murray---------	55.74	---	-----	----	12.50	48.77

PIONEER- - - - - - - - - - - - - - - 11/3/25 - - - - - - - - - - - - - - 8,612 Tons.

Mine----------	54.76	.075	12.02	2.59	13.17	-----
Hughes-Guentzler---------	54.78	----	-----	----	12.94	47.69

W. E. FITZGERALD- - - - - - - - - -11/4/25 - - - - - - - - - - - - - - 6,619 Tons.

Mine----------	54.46	.077	12.33	2.74	12.48	-----
Cremer & Case----------	54.20	---	-----	----	10.70	48.40

PETER WHITE- - - - - - - - - - - - -11/6/25- - - - - - - - - - - - - - 5,680 Tons.

Mine----------	54.84	.080	12.32	3.08	13.30	-----
Cremer & Case----------	55.00	---	-----	----	12.45	48.15

ISHPEMING- - - - - - - - - - - - - -11/13/25 - - - - - - - - - - - - - - 9,431 Tons.

Mine----------	54.82	.079	12.39	2.87	13.04	-----
Hughes-Guentzler---------	55.05	---	-----	----	12.94	47.93

MARQUETTE- - - - - - - - - - - - - -11/21/25 - - - - - - - - - - - - - - 3,908 Tons.

Mine----------	53.16	.077	14.18	2.37	11.75	-----
Oscar Textor----------	54.00	---	-----	----	11.75	47.65

BOEING MINE.

A comparison of the Mine and Lower Lake analysis on the cargoes of Boeing grade, made up of 19,419 tons of North Eddy stockpile ore, 10,415 tons of Hill Direct ore and 503,952 tons of Boeing ore, is as follows:

	FE.	PHOS	SIL.	ALU.	MOIS.	FE.NAT.
Mine----------	55.18	.076	10.77	3.96	14.14	47.38
Lower Lake---------	55.49	---	---	----	13.80	47.83

The mine analysis of the several grades entering into the above mixture follows:

	TONS.	FE.	PHOS	SIL.	MN.	ALU.	MOIS.	FE.NAT.
Boeing Ore---------	503,952	55.16	.078	10.67	.89	4.02	14.41	47.21
North Eddy Ore-----	19,419	52.86	.068	13.64	1.04	1.53	11.65	46.70
Hill Direct Ore----	10,415	60.42	.054	8.93	--	--	5.61	57.03

A composite analysis of the Boeing ore shipped during the year follows:

TONS.	FE.	PHOS	MN.	SIL.	ALU.	LIME	MAGNESIA	SULPHUR	LOSS
503,952	55.17	.079	.91	10.55	3.94	.14	.11	.011	4.98

BOEING MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1925.

GRADE	IRON	PHOS.	SILICA	MANG.	ALUM.	MOIST.
Boeing Merch.,	55.16	.076	10.82	.89	-	-
" Susquehanna,	55.48	.071	11.05	-	-	-
" Lean,			(No Production)			

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR-1925.

	Mine						Lake Erie	
GRADE	IRON	PHOS.	SILICA	MANG.	ALUM.	MOIST.	IRON	MOIST.
Boeing Merch.,	55.18	.077	10.77	-	-	14.14	55.50	13.80
" Susquehanna,			(All Mixed)					
" Lean,			(No Shipments)					

ORE STATEMENT - DECEMBER 31ST, 1925.

	PIT BOEING MERCHANT. ORE	PIT BOEING LEAN ORE	SHAFT BOEING MERCHANT. ORE	SHAFT BOEING LEAN ORE	BOEING SUSQUE-HANNA ORE	TOTAL	TOTAL LAST YEAR
On hand Jan. 1, 1925,	-	33,417	34,982	-	2,110	70,509	51,076
Output for Year,	291,060	-	207,267	-	146	498,473	520,967
Stockpile Overrun,	-	-	5,610	-	-	5,610	3,814
Total,	291,060	33,417	247,859	-	2,256	574,592	575,857
Shipments,	291,060	-	210,636	-	2,256	503,952	505,348
Balance on Hand,	-	33,417	37,223	-	-	70,640	70,509
Decrease in Output,						20,698	
Increase in Ore on Hand,						131	

1925 -- 2-8 Hour Shifts, Jan. 1st to Dec. 31st, 1925.
Pit operated 1-10 Hr. Shift Apr. 30th to Nov. 19th, 1925.

1924 -- 1-8 Hour Shift, Jan. 1st to Dec. 31st, 1924.

BOEING MINE

SHIPMENTS FOR YEAR-1925.

GRADE	PIT	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Pit, Boeing Merchantable,	291,060	-	-	291,060	333,531
Pit, Boeing Lean,	-	-	-	-	-
Shaft, Boeing Merchantable,	-	110,582	100,054	210,636	164,512
Shaft, Boeing Lean,	-	-	-	-	-
Boeing Susquehanna,	-	-	2,256	2,256	7,305
Total,	291,060	110,582	102,310	503,952	505,348
Total Last Year,				505,348	
Decrease,				1,396	

BOEING MINE

COMPARATIVE MINING COST FOR YEAR

	1925	1924	INCREASE	DECREASE
Open Pit Product	291,060	333,531		42,471
Shaft Product	207,413	191,250	16,163	
Total Product	498,473	524,781		26,308
Open Pit Costs				
Operating Accounts	.285	.263	.022	
General Accounts	.037	.029	.008	
Winter Expense	.102	.062	.040	
Stripping Amortization	1.150	1.150		
Total Open Pit Costs	1,574	1.504	.070	
SHAFT COSTS				
Underground Costs	1.232	1.334		.102
Surface Costs	.123	.141		.018
General Mine Accounts	.134	.204		.070
Loading & Shipping	.040	.033	.007	
Total Shaft Costs	1.529	1.712		.183
Depreciation	.400	.400		
Occupation Tax	.028	.024	.004	
Taxes	.061	.080		.017
Central Office	.010	.010		
Uncompleted Construction	.050	.050		
Cost Adjustments	.007	.003	.004	
Misc. Debits and Credits	.006	.009		.003
Total Cost on Cars	2.096	2.116		.020
No.Days Operating - Pit	138	142		4
No.Shifts & Hours	1-10	1-10		
Avg.Daily Product	2,109	2,349		240
No.Days Operating - Shaft	306	307		1
No.Shifts & Hours	2-8	1-8		
Avg. Daily Product	678	623	55	

BOEING MINE

COMPARATIVE WAGES AND PRODUCT

	1925	1924	INCREASE	DECREASE
PRODUCT	207,413	191,250	16,163	
No.Shifts & Hours	2-8	1-8		
AVG.NO.MEN WORKING				
Surface	26	25	1	
Underground	89	91		2
Total	115	116		1
AVG.WAGES PER DAY				
Surface	4.94	4.79	.85	
Underground	5.73	5.91		.18
Total	5.55	5.67		.12
WAGES PER MO. of 25 DAYS				
Surface	123.50	119.75	3.75	
Underground	143.25	147.75		4.50
Total	138.75	141.75		3.00
PRODUCT PER MAN PER DAY				
Surface	25.73	24.08	1.65	
Underground	7.63	6.76	.87	
Total	5.88	5.28	.60	
LABOR COST PER TON				
Surface	.192	.199		.007
Underground	.751	.875		.124
Total	.943	1.074		.131
AVG.PRODUCT BRK'G & TRM'G				
" WAGES CONTRACT LABOR	6.18	6.44		.26
TOTAL NO. OF DAYS				
Surface	8062½	7940½	122	
Underground	27188-3/4	28280½		1091-3/4
Total	35251¼	36221		969-3/4
AMOUNT FOR LABOR				
Surface	39876.31	38034.37	1841.94	
Underground	155806.27	167301.59		11495.32
Total	195682.58	205335.96		9653.38

BOEING MINE

TIMBER STATEMENT FOR YEAR ENDING DECEMBER 31,1925.

KIND	LINEAL FEET	AVG.PRICE PER FOOT	AMOUNT 1925	AMOUNT 1924
7" to 9" Timber	133,096	.1203	16,011.44	13,520.10
9" to 12" "	168,619	.1612	27,181.38	10,244.00
Total Timber - 1925	301,715	.1431	43,192.82	
Total Timber - 1924	237,387	.1001		23,764.20
	LINEAL FEET	PER 100'		
6' Lagging	382,800	.883	3,383.50	4,636.00
Poles	271,448	1.30	3,530.10	2,996.12
Covering Boards	430,499	1.372	5,909.20	3,973.77
Total - 1925	1,074,747		1 2,822.80	
Total - 1924				11,605.89
Product (1)			201,810	187,436
Ft.Timber per ton of ore			1.494	1.266
" Lagging "			1.896	3.600
" Boards "			2.133	1.418
" Poles "			1.345	1.278
" Lagging per foot of timber			1.268	2.842
Cost per ton for Timber			.214	.126
" Lagging			.016	.024
" Poles			.017	.015
" Boards			.029	.021
" Timber,Lagging & Poles			.276	.176
Equivalent of stull timber to bd.measure			678,881	503,013
Ft.Bd.measure per ton of ore			3.363	2.680

(1) Includes overrun.

BOEING MINE

STATEMENT OF EXPLOSIVES USED FOR BREAKING ORE

KIND	QUANTITY	AVERAGE PRICE	AMOUNT 1925	AMOUNT 1924
30% Powder	67,000	.1311	8,788.46	8,277.35
Total Powder	67,000	.1311	8,788.46	8,277.35
Fuse	158,500		1,083.90	1,021.41
Caps	40,800		434.45	439.57
Total Fuse, Etc.			1,518.35	1,450.98
Total Explosives			10,306.81	9,728.33
Product			201,810	187,436
Pounds of Powder per ton of Ore			.331	.342
Cost per ton for Powder			.0435	.044
" Fuse, Etc.			.007	.007
" All Explosives			.0505	.051
Average Price per Pound for Powder			.1311	.12875

ANALYSIS OF BOEING MINE COST SHEET FOR THE YEARS 1924 AND 1925

OPEN PIT

There was produced from open pit operations 291,060 tons during 1925, as compared with 333,531 tons in 1924, or a decrease of 42,471 tons.

The analysis of the 1924 and 1925 open pit cost sheets follows:

PIT OPERATING ACCOUNTS:	1924 COST PER TON	1925 COST PER TON
Drilling and Blasting	.026	.035
Steam Shovels, Operating	.048	.060
" " Repairs & Maintenance	.009	.010
Locos. & Cars, Operating	.072	.070
" " Repairs & Maintenance	.005	.004
Track Expense	.028	.045
Pumping and Drainage	.035	.036
Water Supply	.002	.004
General Open Pit Expense	.035	.017
Open Pit Superintendence	.003	.004
TOTAL	.263	.285
GENERAL ACCOUNTS:		
Engineering	.003	.003
Assaying	.009	.010
Personal Injury Expense	.001	.005
Mine Office	.009	.011
Special Expenses	.001	.000
District Office	.006	.008
TOTAL GENERAL ACCOUNTS	.029	.037
Stripping	1.150	1.150
Winter Expense	.062	.102
COST OF PRODUCTION	$1.504	$1.574

Open pit operations during 1925 were less favorable than in 1924 and during both of these years, the general situation was more difficult than in 1923, when we secured a cost of production of $1.364. The increase in the 1925 cost over that of 1924 amounted to $.07 and is explained by the fact that we were mining out the bottom of the east deposit during the large part of the season and the bottom in this deposit was quite irregular and we encountered a considerable quantity of hard material, which required blockholing and blasting ahead of the shovel. Further than this, the shovel was moved over a considerably greater area during 1925, entailing quite a little delay and increased amount of track work.

BOEING MINE.

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"DRILLING AND BLASTING" shows an increased cost per ton of $.009. This is due to the fact that a larger proportion of our product was very hard material during the past year and there were more delays occasioned by the necessity of blockholing and blasting ahead of the shovel. The purchase of a second-hand Cyclone drill from the Mesabi Iron Company was taken up in the 1925 accounts, which also added to the expense of this item for 1925.

Under the caption "OPERATING STEAM SHOVELS" there was an increase in the 1925 cost per ton of $.012. The output per day of operation of the shovel was lower in 1925 than for the previous year, due in large part to the character of the material encountered and the necessity of doing considerable casting of rocky material and sorting in the pit.

The charges for"STEAM SHOVEL REPAIRS & MAINTENANCE" were approximately the same each year, the larger tonnage handled in 1924 resulting in an increased cost per ton for 1925 of $.001.

"OPERATING LOCOMOTIVES & CARS" shows a decreased cost per ton in 1925 of $.002. This is due to there having been less clean-up work around the edge of the ore bank in 1925 and to the fact that the general track situation for handling ore cars was improved. There should be a decided improvement in the cost against this item during 1926, as our track grades will be more favorable and the clean-up work should be considerably less.

"REPAIRS & MAINTENANCE OF LOCOS. & CARS" was $.001 per ton less in 1925. It was not found necessary to put the amount of repairs on equipment during the operating season of 1925 that was the case the previous season.

The comparatively large increase in the cost per ton for "TRACK EXPENSE" during 1925, amounting to $.017, is explained by the fact that we had to provide a track grade into the bottom of the east end of the pit in order to load out the deep ore and the amount of loading track work was considerably more than during the previous year. This item should show a decided improvement in cost during 1926.

The charges for "PUMPING & DRAINAGE" were approximately the same each year, the small tonnage handled for 1925 explaining the increased cost per ton of $.001 for this year.

We paid the Village of Hibbing for our locomotive "WATER SUPPLY" in 1925, whereas no charge was made to us during 1924. This explains the increase of $.002

per ton in 1925 for "WATER SUPPLY".

There was a decrease of $.018 per ton for "GENERAL PIT EXPENSE" during 1925, as compared with the previous year. The very extensive clean-up work undertaken during 1924 is responsible for this 1925 reduction.

"OPEN PIT SUPERINTENDENCE" was $.001 per ton higher in 1925, due entirely to the small tonnage handled that year.

Under "GENERAL ACCOUNTS" there was no difference in the cost per ton for "ENGINEERING" and the slight increase of $.001 for "ASSAYING" was due to the fact that we did considerable sampling in test-pits and drill holes in order to ascertain what ore could be mined during 1925.

"PERSONAL INJURY EXPENSE" showed an increase of $.004 per ton in 1925, as the result of several semi-serious accidents during the past year.

The increase of $.002 in "MINE OFFICE" is the result of the smaller tonnage handled during 1925.

"WINTER EXPENSE" shows a 1925 increased cost per ton of $.004. This is explained by the fact that the equipment had been subjected to rather severe service during the operating season of 1924 and the replacements and repairs found necessary as the result were much larger than for the previous year. Included in this item is the clean-up work that was undertaken during December, 1925, which was quite a considerable item in the cost.

UNDERGROUND

The underground production for 1925 amounted to 207,413 tons, as compared with 191,250 tons in 1924. The larger output in 1925 and the somewhat more favorable mining conditions is responsible for reducing the underground cost per ton for 1925 by $.19.

The analysis of the 1924 and 1925 underground cost sheets follows:

	----1924---- COST PER TON	----1925---- COST PER TON
UNDERGROUND COSTS:		
Development in Rock	.016	.000
Development in Ore	.089	.031
Stoping	.641	.612
Timbering	.309	.329
Tramming	.074	.067
Pumping	.053	.047
Compressors and Air Pipes	.056	.052
Underground Superintendence	.037	.034
Cave-In	.002	.006
Compressors and Power Drills	.013	.004
Hand Tramming Equipment	.007	.003
Electric Tramming Equipment	.022	.010
Pumping Machinery	.015	.037
TOTAL UNDERGROUND COSTS	1.334	1.232
SURFACE COSTS:		
Hoisting	.026	.023
Stocking Ore	.045	.040
Dry House	.022	.023
General Surface Expense	.019	.020
MAINTENANCE ACCOUNTS:		
Hoisting Equipment	.008	.006
Shaft	.001	.000
Top Tram Equipment	.012	.008
Docks, Trestles & Pockets	.001	.001
Mine Buildings	.007	.002
TOTAL SURFACE COSTS	.141	.123
GENERAL MINE ACCOUNTS:		
Insurance	.003	.003
Engineering	.014	.011
Analysis	.011	.009
Personal Injury Expense	.063	.011
Telephones & Safety Devices	.006	.004
Special Expenses	.001	.000
Mine Office	.033	.030
District Office	.073	.066
TOTAL GENERAL MINE ACCOUNTS	.204	.134
COST OF PRODUCTION	$1.679	$1.489

During 1924 there was a charge of $.016 for "DEVELOPMENT IN ROCK", whereas there was no charge to this account during 1925.

The decrease of $.058 per ton during 1925 for "DEVELOPMENT IN ORE" was due to the fact that most of the underground contracts were slicing, the development work in the east end having been largely accomplished in 1924.

Under "STOPING" there was a decrease of $.029 per ton, which is the result of somewhat more favorable mining conditions in the west end of the mine.

"TIMBERING" shows an increase of $.02 per ton during 1925. This is explained by the fact that the handling charges are higher on account of not being able to take the timber into the pit and distribute it through the west

end raises, also the rather high cost per ton of ore at the east end of the mine, as the result of low mining height and blocking sand runs. The timber used in 1925 cost more than that for the previous year, but there was less of it used per ton of ore mined.

The decreased cost of $.007 per ton in "TRAMMING" is explained by the larger tonnage handled per shift and the fact that our tramming operations were somewhat restricted.

The 1925 reduction of $.006 per ton for "PUMPING" is the result of the larger tonnage mined and a slight decrease in the volume of water pumped.

The charges for "COMPRESSOR & AIR PIPES" was nominal for each year, the larger tonnage handled in 1925 resulting in a decreased cost of $.004 per ton.

"UNDERGROUND SUPERINTENDENCE" shows a 1925 decrease of $.003 per ton, the result of the larger product secured that year.

Under "CAVE-IN" there was an increase of $.004 per ton in 1925, which is the result of the sand runs encountered in the east end and the cost of handling this material.

Under "MAINTENANCE OF COMPRESSORS & POWER DRILLS", there was a 1925 decrease of $.009 per ton. Nine drill machines had been charged out during 1924, whereas the 1925 charges were nominal.

"HAND TRAMMING EQUIPMENT" showed a decreased cost per ton of $.004 in 1925. A number of the cars were remodeled in 1924, which explains the relatively high cost that year.

The 1925 decrease of $.012 to "ELECTRIC TRAMMING EQUIPMENT" was the result of less car wheel replacements during the last year.

There was an increase of $.022 in "PUMPING MACHINERY" in 1925, which is explained by the expense of changing our drainage ditches during the past year.

The charges per ton for "HOISTING" and "STOCKING ORE" were slightly less during 1925, due to the larger output secured.

The larger fuel consumption explains the slight increase in the cost of "DRY HOUSE" for 1925, as compared to the previous year.

We purchased some fire fighting apparatus in 1925 and this explains the increase of $.001 to "GENERAL SURFACE EXPENSE" in 1925.

The maintenance accounts "HOISTING EQUIPMENT" and "SHAFT" were nominal year year, the larger 1925 product showing slight reductions in the cost per ton.

There were only nominal charges to "TOP TRAM EQUIPMENT" in 1925, whereas in 1924 a new car was built and one of the old cars was remodeled. This resulted in a decrease of $.004 per ton in the 1925 cost.

During 1924 the shaft house was remodeled, so as to allow for a double track top tram haulage system. The 1925 charges here were nominal. The decrease in the cost per ton for this account in 1925 was $.005.

The General Accounts "INSURANCE", "ENGINEERING" and "ANALYSIS" were slightly less per ton in 1925, which is due to the larger tonnage secured.

The decrease in the "PERSONAL INJURY" cost per ton in 1925 of $.052 was due to there having been a fatal accident in 1924, whereas in 1925 there were no very serious accidents.

The items "TELEPHONE & SAFETY DEVICES", "SPECIAL EXPENSES" and "MINE OFFICE" all showed a slight decrease in the cost per ton in 1925, as the result of the larger product realized.

WADE MINE

ANNUAL REPORT FOR 1925.

No mining activities of any nature were undertaken at the Wade Mine during the year 1925. The Helmer Mine lease was relinquished early in the year, all the pit and other Helmer equipment having been moved onto the Wade property prior to the termination of our Helmer lease.

One cargo of Wade stockpile ore was shipped the latter part of April. Following is the analysis of the 5,009 tons of Wade stockpile ore, which was shipped in the PETER WHITE April 30th, as obtained from the Mine and Lower Lake sampling:

	FE.	PHOS	SIL.	MN.	MOIS.	FE.NAT.
Mine	56.97	.065	7.75	1.42	12.15	-----
Lower Lake	56.75	---	----	----	12.53	49.64

A composite sample of the Wade Mine shipments for 1925 shows the following results:

	FE.	PHOS	MN.	SIL.	ALUMINA.	LIME	MAGNESIA	SULPHUR	LOSS
Wade Ore	56.97	.064	1.40	7.60	1.80	1.12	.41	.014	5.28

Following is the tonnage and analysis of the ore remaining in stock at the Wade Mine January 1st., 1926:

	TONS	FE.	PHOS	MN.	SIL.
Wade Ore	26,205	57.22	.064	1.27	7.50

WADE MINE ORE ESTIMATE OF JANUARY 1ST. 1926

No ore has been mined from the Wade property during the past four years, nor has any exploratory work been undertaken. The estimates, therefore, remain the same as they were January 1st. 1922. The ore estimates are based on a factor of 13 cubic feet per ton, with a 10% deduction to cover mining loss in the case of the underground ore.

The tonnage and average grade of ore in the several Wade deposits on January 1st., 1926, follows:

	TONS.	FE.	PHOS	MN.	SIL.	MOIS.
West Deposit-------	1,365,000	57.90	.074	1.05	6.79	13.25
East Deposit-------	1,515,000	56.91	.075	1.83	7.44	13.50
Deacon Deposit-----	80,000	56.65	.045	1.16	8.04	12.50
Deacon Deposit-----	95,000	55.77	.053	.42	8.43	12.50

Following are the tonnages and grades of ore in the West Deposit above and below the main haulageway:

	TONS.	FE.	PHOS	MN.	SIL.
Above Main Level----------	1,179,000	57.85	.074	1.33	6.40
Below Main Level----------	186,000	58.11	.073	.74	7.03

The total ore by forty acre tracts as of January 1st., 1926, is as follows:

	TONS.	
SE¼ of SW¼ of Section 12, 58-19----------	305,000	Non-Bessemer.
NE¼ of NW¼ of " 13, 58-19----------	1,305,000	" "
NE¼ of NW¼ of " 13, 58-19----------	80,000	Bessemer.
NW¼ of NW¼ of " 13, 58-19----------	1,365,000	Non-Bessemer.

Of the ore remaining in the Wade Mine, 561,000 tons will be mined by the open pit method and 2,494,000 tons from underground operations.

ESTIMATE OF PRODUCTION FOR 1926

The estimate of production at the Wade Mine for 1926 is based on the assumption that orders to resume underground operations are received February 1st., and the opening and repair work is started immediately thereafter. The period of production is considered from February 1st., to November 15th:

	TONS	FE.	PHOS	MN.	SIL.	MOIS.
Wade Open Pit Ore-------	50,000	58.50	.060	.70	8.05	12.50
Wade Underground Ore----	92,000	56.77	.064	1.43	7.49	12.50
TOTAL AND AVERAGES------	142,000	57.38	.063	1.17	7.69	12.50

For each month that orders to reopen the Wade Mine are delayed, 12,000 tons should be deducted from the underground production. It will take us about two months to open the mine and get the crew organized, before we can realize an output of 12,000 tons per month.

Our open pit production of 50,000 tons is based on mining only the tonnage available without any additional stripping, except for a small amount of hand work in dragging back material that has washed onto the cleaned area. Before any open pit ore can be mined, a new incline tramway will have to be constructed on Wade land and the shaft house and hoisting equipment moved onto the Wade property, unless satisfactory arrangements could be made with the State, for the use of the Helmer pit in connection with the Wade open pit operations. Provided it seems desirable to mine more than 50,000 tons of Wade open pit ore during 1926, it would be necessary to do some additional stripping to make a larger tonnage available.

The lease of the Helmer Mine has not as yet gone back to the State, but no doubt it will during the early part of 1926, as we have notified the parties who now hold the lease from the State, that we would not be interested in sub-leasing from them and it is very doubtful whether they would be able to interest any other mining company.

GENERAL

A force of six men was employed regularly at the Wade Mine during 1925, consisting of a Captain, clerk, three pumpmen and a night watchman. The property was patrolled during the past year and no irregularities of any kind were reported.

There were no accidents at the Wade Mine during 1925.

Monthly inspections were made of the Wade Mine underground workings. The timber throughout the mine is steadily deteriorating and it will be necessary to do considerable repair work before mining activities can be resumed. The timber is broken down in several places and it is now impossible to go into all the working places on the sub-levels.

Captain Wivell, assisted by one of the other employees, has done some repair work in the raises and also on the main level, in the vicinity of the chutes.

The timber, which we have on hand at the Wade Mine, would not be desirable for repair work. This timber has tood in the yards for several years and the life is gone from it. When repairs are started underground at the Wade, we will have to secure a good grade of timber, to safeguard our operations. We have a quantity of cedar lagging at the Wade Mine, which can be used to advantage when we resume underground operations.

Three pumpmen were employed on 8-hour shifts during 1925. With the exception of some flood water from the heavy rains during the early spring, pumping conditions were normal throughout the year. The snow and ice in the pit melted very gradually and there was not a perceptible increase in the volume of water handled during this period. The only repairs made on the pumping equipment during the past year were of a minor character.

HELMER-WADE MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1925.

GRADE	IRON	PHOS.	SILICA	MANG.	MOIST.
Helmer,	(No Production)				
Wade,	(No Production)				

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1925.

	Mine					Lake Erie	
GRADE	IRON	PHOS.	SILICA	MANG.	MOIST.	IRON	MOIST.
Helmer,	(No Shipments)						
Wade,	56.97	.065	7.75	1.42	12.16	56.75	12.53

ORE STATEMENT - DECEMBER 31ST, 1925.

	HELMER	WADE	TOTAL	TOTAL LAST YEAR
On hand January 1, 1925,	-	30,214	30,214	58,576
Output for Year,	-	-	-	21,469
Stockpile Overrun,	-	-	-	488
Total,	-	30,214	30,214	80,533
Shipments,	-	5,009	5,009	50,319
Balance on Hand,	-	25,205	25,205	30,214
Decrease in Output,			21,957	
Decrease in Ore on Hand,			5,009	

1925 -- Mine Idle during Year.

1924 -- Mine Idle Jan. 1st to Sept. 8th, 1924.
1-10 Hr. Shift, Sept. 8th to Oct. 23rd, 1924.
Mine Idle Oct. 24th to Dec. 31st, 1924.

HELMER-WADE MINE

SHIPMENTS FOR YEAR-1925.

GRADE	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Helmer,	-	-	-	38,641
Wade,	-	5,009	5,009	11,678
Total,	-	5,009	5,009	50,319
Total Last Year,			50,319	
Decrease,			45,310	

WADE-HELMER MINE

COMPARATIVE WAGES AND PRODUCT

	1925	1924	INCREASE	DECREASE
PRODUCT	0	21,957		21,957
No.Hours & Shifts				
AVG.NO.MEN WORKING				
Surface	2	9		7
Underground	4	8		4
Total	6	17		11
AVG.WAGES PER DAY				
Surface	6.06	4.94	1.12	
Underground	5.14	5.21		.07
Total	5.46	5.07	.39	
WAGES PER MO. OF 25 DAYS				
Surface	151.50	123.50	28.00	
Underground	128.50	130.25		1.75
Total	136.50	126.75	9.75	
PRODUCT PER MAN PER DAY				
Surface		7.59		7.59
Underground		7.77		7.77
Total		3.84		3.84
LABOR COST PER TON				
Surface		.650		.650
Underground		.671		.671
Total		1.321		1.321
AVG.PRODUCT BRK'G & TRM'G				
" WAGES CONTRACT MINERS				
" " " TRAMMERS				
TOTAL NO. OF DAYS				
Surface	764-3/4	2891		2126¼
Underground	1441	2824		1383
Total	2205-3/4	5715		3509¼
AMOUNT FOR LABOR				
Surface	4636.52	14282.76		9646.24
Underground	7402.26	14723.52		7321.26
Total	12038.78	29006.28		16967.50

Proportion of Surface to Underground Men:
1925 - 1 to 2
1924 - 1 to .88
1923 - 1 to 1
1922 - 1 to 2.50
1921 - 1 to 3.92
1920 - 1 to 2.84
1919 - 1 to 3.14

1924 - Pit operations during months of Sept. and Oct.
1925 - Mine Idle.

ANNUAL REPORT FOR THE YEAR ENDING DECEMBER 31, 1925.

Ishpeming, Michigan,

January 9, 1926.

ENGINEERING DEPARTMENT.

The following is the report of the Engineering Department. The photographic maps and views which form part of this report have been bound and the books labeled as follows:

LIST OF ANNUAL REPORT MAP BOOKS FOR 1925.

Cleveland-Cliffs Iron Company,
Ishpeming, Republic & Iron River Districts.

Cleveland-Cliffs Iron Company,
North Lake District.

Cleveland-Cliffs Iron Company,
Negaunee & Cascade Districts.

Cleveland-Cliffs Iron Company,
Gwinn District.

Cleveland-Cliffs Iron Company,
Mesabi District.

These books contain the maps of the Company's mines; two sets of them have been prepared, one for the Cleveland office and the other is to be kept in the vault in this office. No new maps or photographs of the hydro-electric system were made during the year so that this heading has been omitted.

Special books have been prepared for the other companies which are interested in the Cleveland-Cliffs Iron Company's mines and also books and loose prints have been given to the superintendents of the various districts as follows:

BOOKS.

NUMBER.	MINE OR DISTRICT.	FOR WHOM.
1	Negaunee Mine,	Bethlehem Iron & Steel Corporation.
1	Athens Mine,	Pickands, Mather & Company.
1	Boeing Mine,	Col. J. B. Cavanaugh.
1	Mesabi District,	M. H. Barber.
5	Boeing & Hill-Trumbull Mines,	Directors, Mesaba-Cliffs Iron Mining Co.
2	Boeing & Hill-Trumbull Mines,	Arthur Iron Mining Company.
1	Negaunee & Cascade Districts,	G. R. Jackson.
1	Gwinn District,	W. W. Graff.
1	North Lake District,	C. J. Stakel.
1	Republic & Iron River Districts,	W. R. Meyers.

LOOSE LEAVES.

Cliffs Shaft and Holmes,	Lucien Eaton.
Boeing Mine,	Carl Brewer.
Hill-Trumbull,	H. C. Bolthouse.

The address of Colonel J. B. Cavanaugh is Royal Mineral Association, Hibbing, Minnesota.

Maps of the Athens Mine have been sent monthly to the Cleveland office for Pickands, Mather & Company. No mining operations were conducted during the year 1924 upon the portion known as the Corbit lease. On the Mitchell lease, mining operations have been conducted. Maps for the fee owners have been supplied upon demand. The management of the Lucky Star Mine was furnished with maps of the -220 sub-level of the Athens Mine showing ore removed from Lucky Star property South of Harvey Lot 12 at their request.

No maps of the Barnes-Hecker or Moore and Chase properties have been requested during 1925. Mr. P. P. Chase has made several visits to this office and has been informed as to the progress of mining operations. Mr. George W. Moore of Detroit has also visited the office on two occasions.

For the fee owners of the Negaunee Mine, 14 sets of maps have been prepared and sent to the Cleveland office.

Maps of the Roman Catholic Cemetery property at Negaunee have been sent ~~to~~ each month to Mr. R. S. Archibald, the engineer in charge. For the Stephenson Mine fee owners, maps have been furnished to their

engineer from the Gwinn office.

The Lessors of the Virgil Mine have been furnished with maps in accordance with the terms of the lease.

Mr. R. J. Chenneour, Assistant Engineer, has written the following pages covering the report of work done by the force employed in the Engineering office.

Following the above, I have added a few remarks on the Abstract Department and on various subjects.

J. E. Jopling
Chief Engineer.

JEJ:LTD.

REMARKS ON THE ABSTRACT DEPARTMENT AND VARIOUS SUBJECTS FOR THE YEAR 1925.

Documents received have been recorded and copies made where necessary.

MINING OPTIONS AND LEASES.

No options nor mining leases were taken out in 1925. The lease of the Helmer Mine, St. Louis County, Minnesota, was surrendered on January 20, 1925.

MISCELLANEOUS DOCUMENTS RECORDED.

The following is a list of documents recorded during the year:

	NO. RECEIVED.	LAST FILE NO.
Land offers, - - -	59	1573
Authorizations, - -	0	117
Deeds and Miscellaneous,	52	909
Easements, - - -	3	149
Rights of Way, - - -	0	201
Water rights, - - -	3	35
Surface leases, - -	43	2483
Applications for Sale, -	4	81
Sales, - - - - - -	14	413
Tax Histories, - - -	1	554
Legal Opinions, - - -	6	189

LAND OFFERS.

Of the 59 land offers, 37 were those of lots and house property mostly in Negaunee. The rest were mostly offers of mineral lands, nearly all of them being in Michigan or Minnesota.

DEEDS AND MISCELLANEOUS DOCUMENTS.

Most of these consist of the record of deeds of lots in Negaunee to this Company. The rest are deeds and some leases and various other documents pertaining to mining property. The documents in the so-called Oliver Exchange are included.

SURFACE LEASES.

These cover farm leases, as well as those for building lots and are scattered through the various mining districts of the Company.

SALES.

These were mostly for camp sites.

LAND OFFER PLAT BOOK.

This book has been posted with the offers received.

ABSTRACTS OF TITLE.

The book containing the Minnesota abstracts, compiled by Mr. Carl Brewer, has been completed. This covers the property owned or leased by the Company in Minnesota.

Abstract Book No.1, covering the mineral lands in the Negaunee and Gwinn Districts, has been posted by Mr. C. W. Nicolson; also he has posted Book No.2 to show the transfers in the Oliver Exchange. The Maas-Negaunee Mine Abstract Book was also posted by him.

MICHIGAN STATE TAX COMMISSION.

The maps and estimates of tonnages in the various mines were sent to the Tax Commission at the end of January. Mr. Pardee, the Engineer for the Commission, visited the district later.

During January, a number of descriptions of the mining properties of this Company were prepared for the Commission by Mr. Thomas Clancey and J. E. Jopling.

FORCE OF ENGINEERS.

Mr. Charles W. Allen of Reading, Pennsylvania, took a position on the force of engineers on June 29, 1925, just after his graduation at Lehigh University.

Mr. M. Duncan Harris of Marquette was employed as a helper during the months of July and August, which was part of his vacation from Lehigh University.

OLIVER EXCHANGE.

The documents included in the so-called Oliver Exchange were signed by the officers of this Company on January 26th. This covered the exchange of interests in the Lake Superior Iron Company for certain lands at Negaunee, including the so-called Adams Strip and Race Course and exchanges of mineral leases at Ishpeming.

CARBON FOR DIAMOND DRILLING.

No carbon for diamond drilling was purchased in 1925.

ENGINEERING DEPARTMENT.

REPORT OF THE ENGINEERING FORCE EMPLOYED DURING THE YEAR 1925,

AND A BRIEF OUTLINE OF THEIR WORK,

BY REGINALD J. CHENNEOUR, ASSISTANT CHIEF ENGINEER.

THE FORCE.

C. W. Allen, a graduate mining engineer of Lehigh University, was employed as an engineer on June 29th.

M. Duncan Harris was employed during a part of July and all of August as an engineer's helper.

With the above exceptions, the force is the same as it was in 1925.

The following table shows the personnel of the Department during the year, arranged in order of entrance:

NAME.	POSITION.	ENTERED.
R.J.Chenneour,	Asst. Chief Engineer,	Entire year.
H. O. Moulton,	Engineer,	" "
A. Rock,	Helper,	" "
J. Trosvig,	Engineer,	" "
T. A. Miller,	"	" "
S. Malmgren,	Hepler,	" "
C.W.Nicolson,	Engineer,	" "
K. C. Pellow,	"	" "
A. Minnear,	Helper,	" "
F. A. Olson,	Engineer and Helper,	" "
C. W. Allen,	Engineer,	June 29, 1925.

The following table shows the days worked, days sickness, percentage of days worked, etc, for all men in the Department. The vacation column shows time granted for regular vacations. Eight hours comstitutes a working day. There was no work Saturday afternoons during the year. The total days as shown in the table are actual working days:

NAME.	DAYS WORKED.	DAYS VACATION.	DAYS SICK.	TOTAL DAYS.	PERCENTAGE DAYS WORKED.
R.J.Chenneour,	271	6	0	277	97.8
H. O. Moulton,	268½	6½	2	277	96.9
C.W.Nicolson,	265	12	0	277	95.7
T. A. Miller,	264	9	3	277	95.3
K. C. Pellow,	271	0	6	277	97.8
J. Trosvig,	265½	11½	0	277	95.8
F. A. Olson,	268½	8½	0	277	96.9
C. W. Allen,	141½	0	0	141½	100.00
A. Rock,	267	10	0	277	96.4
A. Minnear,	267½	8	1½	277	96.6
S. Malmgren,	273	0	4	277	98.5

The following table shows the number of working days lost because of sickness and vacation by men in the Department for the last five years:

	1921.		1922.		1923.		1924.		1925.	
	VACATION.	SICK.	VACATION.	SICK.	VACATION.	SICK.	VACATION.	SICK.	VACATION.	SICK.
R.J.Chenneour,	17	3	11	0	6	0	1½	0	6	0
H. O. Moulton,	4½	0	23	2	9½	1	7	0	6½	2
C.W.Nicolson,	24	0	10½	0	1	0	17½	0	12	0
T. A. Miller,	3½	0	23	0	7½	0	7½	0	9	3
K. C. Pellow,	13½	49½	11	7½	9½	7	3½	9½	0	6
J. Trosvig,	11½	8	10	5	0	0	8	5½	11½	0
A. Rock,	4½	0	6½	4	½	6½	10½	6½	10	0
A. Minnear,	0	0	0	0	4	2	4	½	8	1½
S. Malmgren,	0	0	0	0	0	0	0	3½	0	4
F. A. Olson,							9	0	8½	0
C. W. Allen,									0	0

The following table gives the namesm of the men employed in the Department during the last fiveyears, arranged in order of entrance, showing the months worked and the average number of men per year:

	1921.	1922.	1923.	1924.	1925.
R.J.Chenneour,	12	12	12	12	12
H. O. Moulton,	12	12	12	12	12
A. Rock,	12	12	12	12	12
J. Trosvig,	12	12	12	12	12
J. E. Hayden,	12	12	12	4½	0
T. A. Miller,	12	12	12	12	12
S. Malmgren,	6	0	12	12	12
C.W.Nicolson,	12	12	12	12	12
A. Minnear,	6	3½	12	12	12
K. C. Pellow,	12	12	12	12	12
P. Denn,	5	0	0	0	0
F. A. Olson,	6	0	0	10	12
C. C. Taylor,	6	0	0	0	0
A. E. Carlson,	6	0	0	0	0
J.D.McCarthy,	6	0	0	0	0
C. W. Allen,					6
Average number of men,	11 5/12	8¼	10	10 2/12	10½

The work performed by each man in the Department is described briefly as follows:

Reginald J. Chenneour, as Assistant Chief Engineer, has had charge of the office during the year, supervising the office work, field and underground surveys. At various times he assisted the engineers with their underground and surface surveys. He spent several days on the proposed Au Train storage basin, running out locations for a proposed dam on the North end and a levee on the South end.

In the office, he made a table of capacities of the above basin for each foot of rise from 768' to 788' above sea level.

In May, he went to the Algoma Steel Company's plant at Sault Ste. Marie, Ontario, and together with their engineers made a joint estimate of the Cleveland-Cliffs Iron Company's ore in stock.

He made sieve tests of Cliffs Shaft, Holmes and Republic ores.

In the office, in addition to the regular work, he assembled the annual report and Tax Commission maps, had them photographed and printed and bound in books.

Henry O. Moulton, Engineer, has been in charge of the engineering work at the Negaunee and Maas Mines for the entire year.

At the Negaunee Mine, he made the regular monthly surveys and did considerable work in connection with the installation and operation of the new ventilating fan.

In the office, in additionx to the regular work, he made the Tax Commission estimate and maps and prepared the annual report maps for the above mine.

At the Maas Mine, he made the regular surveys until work was started on the shaft. While this work was in progress, he devoted his entire time to it.

In the office, he prepared Tax Commission estimate and maps and the annual report maps.

Below is a table showing the percentage of his time spent at the

Negaunee and Maas Mines and miscellaneous work:

	UNDERGROUND.	FIELD.	OFFICE.	TOTAL.
Negaunee Mine,	9	3	18	30
Maas Mine,	22	24	20	66
Miscellaneous,	2	1	1	4
Total,	33	28	39	100

Clyde W. Nicolson, Engineer, had charge of the engineering work at the Athens Mine for the entire year.

At this mine, he made the monthly surveys and noted and posted geology.

In the office, he prepared the annual report maps and made the Tax Commission estimate and maps.

In the Cascade District, he represented this Company in the field in making a joint survey to locate the corners in place and to replace the missing corners in Section 27, 47-26.

He spent several days in the field re-locating the land corners of the Barnes-Hecker Mine.

At the Negaunee Mine, he assisted in installing the ventilating equipment and made tests after it was in operation.

He spent several days at the various mines working with the Economy Committee, of which he was a member.

In the office, he spent several days on the abstracts in connection with the Oliver Exchange, Race Track, Athens Mine, Maas-Negaunee Mines, and the Sterling-Mackenzie interests.

Below is a table showing the percentage of his time spent at the Athens Mine and other miscellaneous work:

	UNDERGROUND.	FIELD.	OFFICE.	TOTAL.
Athens Mine,	8	9	27	44
Miscellaneous,	3	23	30	56
Total,	11	32	57	100

Tom A. Miller, Engineer, did the engineering work at the Cliffs Shaft Mine for the entire year.

At this mine, he made monthly surveys and located all diamond

drill holes.

On the surface, he gave lines for stocking trestles and made ore estimates. He also made a time study of the hoisting and top tramming system to show time interval for skips and cars.

In the office, he prepared the annual report maps and made the Tax Commission estimate and maps.

In the field, he made surveys to estimate the yardage of diorite in the area adjacent to the Salisbury Mine.

In the office, he made the maps to show miscellaneous water power projects.

Below is a table showing the percentage of his time spent at the Cliffs Shaft Mine and other miscellaneous work:

	UNDERGROUND.	FIELD.	OFFICE.	TOTAL.
Cliffs Shaft Mine,	22	4	55	81
Miscellaneous,	1	1	17	19
Total,	23	5	72	100

Kenneth C. Pellow, Engineer, did the engineering work at the Republic, Barnes-Hecker and Spies-Virgil Mines.

At the Republic Mine, he made the regular monthly surveys, gave lines for shaft sinking and located all diamond drill holes. He also made a time study underground of the drilling speed of various drills.

In the office, he made the Tax Commission estimate and maps and prepared the annual report maps.

At the Barnes-Hecker Mine, he made the regular surveys and assisted the geologists with their underground work.

In the field, he did some work tying in the surface land corners.

In the office, he made the Tax Commission estimate and maps and annual report maps.

At the Spies-Virgil Mine, he made regular surveys, located diamond drill holes and assisted the geologists with their underground work. New development work at this mine has taken considerable of his time and has necessitated a number of trips to the mine.

In the office, he made the annual report maps and the Tax Commission estimate and maps.

Below is a table showing the percentage of his time spent at the Republic, Barnes-Hecker and Spies-Virgil Mines:

	UNDERGROUND.	FIELD.	OFFICE.	TOTAL.
Spies-Virgil Mine,	15	2	25	42
Barnes-Hecker Mine,	8	2	19	29
Republic Mine,	11	0	18	29
Total,	34	4	62	100

John Trosvig, Engineer, did the engineering work at the Morris-Lloyd Mine for the entire year.

At this mine, he made the regular surveys, located diamond drill holes and assisted the geologists with their underground work. He also made a time study of the cutting speed of various auger drill bits.

On the surface, he gave lines for additional stocking trestle. He also gave lines for a drainage ditch which is being dug to drain the water from the swamp to the West of the Morris shaft. This ditch when completed will do away with the pumping equipment which is being maintained at North Lake.

In the office, he made the Tax Commission estimate and maps and prepared the annual report maps.

Below is a table showing the percentage of his time spent at the Morris-Lloyd Mine and miscellaneous work:

	UNDERGROUND.	FIELD.	OFFICE.	TOTAL.
Morris Mine,	20	4	46	70
Lloyd Mine,	10	2	15	27
Miscellaneous,	0	1	2	3
Total,	30	7	63	100

Frederick A. Olson, Engineer and Helper, did the engineering work at the Holmes Mine for the entire year.

At this mine, he made the monthly surveys, made the Tax Commission estimate and maps and prepared the annual report maps.

In the field, he made cross-sections of the road around Carp Basin No.2 and in the office made an estimate of the yardage required to raise the road 10', which would be necessary should the basin be raised an additional 10'.

In the office, he prepared new maps for the tax book and made a map of the City of Ishpeming to show the various plats.

Below is a table showing the percentage of his time spent at the Holmes Mine and miscellaneous work:

	UNDERGROUND.	FIELD.	OFFICE.	TOTAL.
Holmes Mine,	14	2	29	45
Miscellaneous,	3	10	42	55
Total,	17	12	71	100

Charles W. Allen, Engineer, was employed in June and did the work for the Ogden Mine and helped the engineers with their underground and field surveys.

At the Ogden Mine, he made weekly surveys and kept up an analysis map to show the grade of ore encountered in the various steal shovel cuts. He also surveyed the territory adjacent to the Ogden Mine to show a possible extension of the Ogden ore body.

In the office, in addition to the Ogden work, he made acrossp section of the Pascoe Shaft of the Republic Mine. He also posted the Negaunee Mine surveys while Mr. H. O. Moulton was engaged on the Maas shaft and trestle work.

Below is a table showing the percentage of his time spent at the Ogden Mine and miscellaneous work:

	UNDERGROUND.	FIELD.	OFFICE.	TOTAL.
Ogden Mine,	0	16	41	57
Miscellaneous,	13	10	20	43
Total,	13	26	61	100

Archibald Minnear, Draftsman and Helper, assisted the engineers with their underground and office work.

Below is a table showing the percentage of his time underground, in the field and office:

UNDERGROUND.	FIELD.	OFFICE.	TOTAL.
30	15	53	100

Albert Rock, Helper, assisted the engineers with their surface and underground surveys and drove the truck. During two months of the year, most of his time was taken up in printing the annual report maps.

Below is a table showing the percentage of his time underground, in the field and office:

UNDERGROUND.	FIELD.	OFFICE.	TOTAL.
6	54	40	100

Sextus Malmgren, Helper, assisted the engineers with their underground and surface surveys, cleaned tapes, made blue prints and assisted in printing the annual report.

Below is a table showing the percentage of his time underground, in the field and office:

UUDERGROUND.	FIELD.	OFFICE.	TOTAL.
32	15	53	100

M. Duncan Harris, Helper, was employed during part of July and all of August assisting the engineers with their underground and surface surveys.

Below is a table showing the percentage of his time underground, in the field and office:

UNDERGROUND.	FIELD.	OFFICE.	TOTAL.
26	42	32	100

The following table shows the percentage of time spent underground, in the field and in the office for engineering work for the mines in this district:

	UNDERGROUND.	FIELD.	OFFICE.	TOTAL.
Athens,	15	23	62	100%
Barnes-Hecker,	22	16	62	100
Cliffs Shaft,	37	6	57	100
Holmes,	29	10	61	100
Lloyd,	32	15	53	100
Maas,	22	42	36	100
Morris,	26	15	59	100
Negaunee,	21	26	53	100
Ogden,	0	49	51	100
Republic,	41	3	56	100
Spies-Virgil,	33	5	62	100
Average,	28	16	56	100

The next table shows the distribution of time and the cost to the various mines and other work for the last three years:

ENGINEERING DEPARTMENT.

DISTRIBUTION OF ENGINEERING LABOR FOR YEARS 1923, 1924 AND 1925.

	1923.			1924.			1925.				
	LABOR.	TIME IN DAYS.	PER-CENT.	LABOR.	TIME IN DAYS.	PER-CENT.	LABOR.	TIME IN DAYS.	PER-CENT.	PERCENT INCREASE.	PERCENT DECREASE.
Athens,	$3712.44	377	15.42	$2671.59	236¼	8.40	$2117.24	203¾	8.50	.10	
Barnes-Hecker,	1557.24	195½	6.47	1378.65	167	5.93	1500.76	184¼	6.00	.07	
Cliffs Shaft,	2601.51	338½	10.81	3250.38	406	14.43	3401.18	430½	13.60		.83
Holmes,	1483.78	185½	6.17	1549.96	214	7.60	1624.16	224¾	6.50		1.10
Lloyd,	1306.27	169	5.43	930.78	110	3.91	1129.84	132¾	4.50	.59	
Maas,	2660.75	274¾	11.06	2305.75	210	7.47	3476.35	346¾	13.90	6.43	
Morris,	2556.13	342½	10.62	2344.46	281½	10.01	2495.76	288¾	10.00		.01
Negaunee,	2944.76	280½	12.24	2308.79	222	7.89	2270.30	219¼	9.10	1.21	
Ogden,	0			80.64	7	.25	755.95	106	3.00	2.75	
Republic,	1534.23	178	6.38	1456.49	172	6.11	1374.52	165	5.50		.61
Salisbury,	23.79	3½	.10	718.67	107	3.80	15.82	2	0.10		3.70
South Jackson,	24.01	2½	.10	84.46	8	.28	0				.28
Spies,)	415.92	44½	1.73	277.63	32½	1.15					
Virgil,)	602.53	78	2.51	1059.59	119½	4.25	1886.66	230½	7.50	2.10	
Total Ishpeming, Negaunee, Republic & Iron River,	$21423.36	2469¼	89.04	$20417.84	229 2¾	81.48	$22048.54	2533¾	88.20	6.72	
GWINN DISTRICT MINES.											
Austin,	$60.12	9	.34	$39.47	5	.18	0				.18
Francis,	85.70	12	.35	80.13	9½	.34	$6.02	½			.34
Gwinn,	0			240.85	19	.67	17.99	2	0.10		.66
Stephenson,	73.45	10½	.30	173.32	25½	.91	62.14	6	0.20		.89
Total Gwinn District,	$219.27	31½	.89	$533.77	59	2.10	$86.15	8½	0.30		2.07
MESABI DISTRICT MINES.											
Boeing,	$77.02	11½	.32	$81.45	10½	.37	$73.42	10	0.30		.07
Hill-Trumbull,	78.84	11½	.33	81.45	10½	.38	71.30	9	0.30		.08
Wade-Helmer,	0			9.84	1½	.05	0				.05
Total Mesabi District,	$155.86	23	.65	$172.74	22½	.80	$144.72	19	0.60		.20
WATER POWER.											
Misc. Water Power,	0			0			$269.81	32	1.10	1.10	
Dead River Stor.Dam E. & A. 41,	$1049.97	99	4.36	$922.86	87	3.09	0				3.09
Oper.Elec.Power Plants,	650.23	72½	2.70	650.80	63	2.24	557.73	79	2.20		.04
Escanaba River Water Power,	0			194.64	15	.53	0				.53
Total,	$1700.20	171½	7.06	$1768.30	165	5.86	$827.54	111	3.30		2.56
SURVEYS AND CONTOURS.											
Section 22, 47-27,	18.62	3½	.08	0							
" 24, "	5.56	1	.02	0							
" 27, "	10.64	2	.05								
Cascade Exploration,	0			1581.01	222	7.89	164.08	19	0.70		7.19
Total,	$34.82	6½	.15	$1581.01	222	7.89	$164.08	19	0.70		7.19
MISCELLANEOUS.											
City of Ishpeming,	0			0			$324.76	50	1.30	1.30	
Abstracts,	$177.00	15	.73	$216.39	18½	.66	942.67	85½	3.80	3.14	
Oper.Hydro Elec.Plants Carp Basin No.2,	$118.09	11½	.49	0			0				
Miscellaneous,	236.45	22½	.99	318.17	34	1.21	$463.43	49	1.80	.59	
Total,	$531.54	49	2.21	$534.56	52½	1.87	$1730.86	184½	6.90	5.03	
Grand total,	$24065.05	2750¾	100.00	$25008.22	2813¾	100.00	$25001.89	2875¾	100.00		

OFFICE EXPENSE.

Below is a comparative table of office expense for the last three years:

	1923.	1924.	1925.
Traveling expense and livery,	$ 295.27	$ 80.75	$ 6.60
Supplies (see below), - -	2453.41	1967.72	1591.58
Operating automobiles, - -	1261.85	1242.80	1023.10
Office expense, - - - -	306.18	556.63	11.07
Insurance, - - - - - -	231.25	231.25	298.16
Taxes, - - - - - - -	42.78	43.96	41.11
Total,	$4590.74	$4123.11	$2971.62
Total salaries general office, Engineers#, - -	$24065.05	$25008.22	$25001.89
Total charges to Eng. Dept,	$28655.79	$29131.33	$27973.51
#Does not include salary of Chief Engineer and Stenographer.			

The following table shows the extraordinary charges for the year 1925:

Keuffel & Esser Company, - - - -	$64.37
Stenglein Bindery, - - - - -	89.33
George A. Newett, - - - - -	43.40
Lufkin Rule Company, - - - - -	27.95
The C. F. Pease Company, - - - -	51.00
American Blue Print Paper Company, -	26.87
Keuffel & Esser Company, - - - -	83.80
Stenglein Bindery, - - - - -	20.40
American Blue Print Paper Company, -	20.50
Keuffel & Esser Company, - - - -	155.14
American Blue Print Paper Company, -	18.83
American Blue Print Paper Company, -	12.86
George A. Newett, - - - - -	12.50
Keuffel & Esser Company, - - - -	23.88
Keuffel & Esser Company, - - - -	29.60
Keuffel & Esser Company, - - - -	42.00
C. L. Begger & Sons, - - - -	52.60
Keuffel & Esser Company, - - - -	29.60
Childs Art Gallery, - - -- -	361.70
Depreciation of Dodge Touring car, -	66.25

AUTOMOBILES.

The Dodge truck and touring car were operated the entire year. Below is a table showing the auto expense for three years:

	1923.	1924.	1925.
Company horses,	$ 289.14	$ 80.55	0
Company automobiles;			
Expense, - -	1261.85	1242.80	$1023.10
Traveling expense,	6.13	.20	6.60
Total,	$1557.12	$1323.55	$1029.70

COST OF OPERATING AUTOMOBILES.

Gasoline, oil, etc,	$ 169.97	$ 212.00	$ 266.05
Tires and tools,	206.41	99.11	151.87
Repairs, - - -	116.35	239.12	348.99
Miscellaneous, - -	77.18	29.40	85.18
Insurance, - - -	104.81	104.76	104.76
Depreciation, - -	587.13	558.41	66.25
Total,	$1261.85	$1242.80	$1023.10

M I N E S.

ATHENS MINE.

Regular surveys were made and all geology posted. The coal in stock was also estimated.

BARNES-HECKER MINE.

Regular surveys were made and the geology noted and posted. On the surface, the land corners were tied in to the underground survey system.

CLIFFS SHAFT MINE.

Regular monthly surveys were made and all drill holes located. Due to the fact that practically all the ore was shipped, new stocking trestles had to be laid out. A time study of hoisting and top tramming was aldo made.

HOLMES MINE.

Regular monthly surveys were made at this mine. On the surface, an estimate was made of the Holmes Bessemer ore in stock. The outline of the caving area was surveyed.

MAAS MINE.

Regular surveys were made and the geology noted and posted. This mine was close from July 1st to O ctober 15th while the shaft was being altered. A permanent steel trestle was also erected during this time. Lines were given for the foundations of an additional crushing unit at the district crusher, which is located at this mine. An engineer was kept constantly on the job during the construction and shaft work period.

MORRIS MINE.

Underground surveys were made and all geology noted and posted. Drill holes were also surveyed. On the surface, additional stocking trestle was laid out.

NEGAUNEE MINE.

Surveys were made and geology noted and posted. A ventilating fan was erected on surface at No.2 shaft to furnish air for the Maas

and Negaunee Mines.

OGDEN MINE.

Weekly surveys were made and an analysis map kept posted to show the material encountered in each steam shovel cut. Territory adjacent to the mine was surveyed and contoured for possible extensions of the Ogden ore body.

REPUBLIC MINE.

Monthly surveys were made and all diamond drill holes located. Lines were given in the Pascoe Shaft for sinking. A cross-section was made of the Pascoe Shaft to show the progress of sinking below the 1950' level.

SPIES-VIRGIL MINE.

Surveys were made and lines given on the main and sub-levels. Development work at this mine has required an unusual amount of survey work.

MISCELLANEOUS.

NORTH LAKE DRAINAGE DITCH.

Lines and grades were given for a new drainage ditch to drain the water from North Lake and thus do away with the pumping equipment which is being used.

CARP RIVER STORAGE BASIN NO.2.

An estimate was made of the yardage which would be necessary to raise the present road around the basin 10'.

AU TRAIN WATER POWER.

Surveys and yardage estimates were made for a proposed dam and levee. A table was prepared to show capacities for each foot of rise from elevation of 768 to 788.

MISCELLANEOUS WATER POWER.

Maps were prepared of various water powers to show the lands which we own.

CASCADE DISTRICT LAND CORNERS, SECTION 27, 47-26.

Our engineers, together with those of M. A. Hanna & Company, Oliver Iron Mining Company and Mr. Charles Cummings, County Surveyor, representing the other interests, replaced land corners missing on the above section. A map was prepared showing all corners, the distance and the included angles between each.

CITY OF ISHPEMING MAP.

A map of the City of Ishpeming was made which shows all the plats.

TAX MAPS.

The book of tax maps was revised. A number of new maps had to be prepared.

ABSTRACTS.

Considerable work was done by the Engineering Department on miscellaneous abstracts.

TRAP ROCK.

The various diorite bluffs were sampled and an estimate oade of the probable yardage available in the bluff to the North of the Salisgury Mine.

Ishpeming, Michigan,

January 15, 1926.

ANNUAL REPORT - GEOLOGICAL DEPARTMENT.

I beg to submit herewith my report for the year ending December 31, 1925, covering the work of the Geological Department; the geological surveys, and the drilling explorations conducted during that time.

The detailed report of drilling in the Cliffs Shaft, Republic and Virgil Mines will be found in the annual report book labeled, "The Cleveland-Cliffs Iron Company - Ishpeming, Republic and Iron River Districts"; the drilling in the Morris Mine will be found in the book labeled "The Cleveland-Cliffs Iron Company - North Lake District"; the drilling at the Cascade Exploration will be found in the book labeled "The Cleveland-Cliffs Iron Company - Negaunee and Cascade Districts". These books are submitted as a part of the annual reports of the Engineering and Geological Departments.

E. L. Derby, Jr.

Geologist.

ELD:LTD.

COPY TO HLS.

THE CLEVELAND-CLIFFS IRON COMPANY.

REPORT OF THE GEOLOGIST FOR THE YEAR ENDING DECEMBER 31, 1925.

STAFF.

The staff of the Geological Department in 1925 is shown in Table I below. The personnel has remained the same throughout the year:

TABLE I.

NAME.	OCCUPATION.	DURATION OF EMPLOYMENT IN 1925.	DAYS LOST. SICKNESS.	DAYS LOST. VACATION.	% OF WORKING DAYS WORKED.
E.L.Derby,Jr.	Chief Geologist.	Entire year	0	$2\frac{3}{4}$	99.0
M. C. Drake	Assistant Geologist.	" "	$3\frac{1}{2}$	$7\frac{1}{4}$	96.1
E. A. Allen	Assistant, testing diamond drill holes, collecting and labeling samples, etc.	" "	0	$5\frac{1}{2}$	98.0
Gustav Afuhs	Draftsman.	" "	$1\frac{1}{2}$	6	97.3

The year was divided into the factors as shown in Table II below:

TABLE II.

Total days of eight hours worked, - - -	$276\frac{3}{4}$ days.
Sundays, - - - - - - - - - -	52 "
Days resulting from Saturday afternoons, -	26 "
Holidays, - - - - - - - - - -	$10\frac{1}{4}$ "
Total,	365 days.

Table III, below, shows the average number of men regularly employed on the staff of the Geological Department during the past five years:

TABLE III.

YEAR.	AVERAGE NUMBER OF MEN.
1921	3.56
1922	3.00
1923	3.00
1924	3.58
1925	4.00

DIVISION OF WORK AMONG THE MEMBERS OF THE DEPARTMENT.

H. L. Smyth. The work of the Geological Department has continued under the direction of Mr. H. L. Smyth as Consulting Geologist.

E. L. Derby, Jr. I continued to have charge of the Department as Chief Geologist. The larger part of my time, as in former years, was taken up with the general oversight and supervision of the work of the Department. This has included, besides the usual routine office work, surface drilling explorations in the Cascade District; underground drilling in the Cliffs Shaft, Morris, Republic and Virgil Mines; and the geological surveys in the Athens, Barnes-Hecker, Cliffs Shaft, Holmes, Morris-Lloyd, Negaunee, Republic, Spies-Virgil and Stephenson Mines. I, personally, made frequent underground geological surveys of the new development work in the mines.

My time, not taken up with these duties, was spent chiefly as follows:

In January, I was in conference with Messrs. Reigart and Kronquist of the Mining Department of the Ford Motor Company relative to their drilling on Section 7, 46-29, lying West of Smith's Bay at Republic and on the West limb of the Republic trough. One hole was drilled by them and found no iron formation between the quartzite hanging and the greenstone footwall.

In February, I went over the valuation of the Cascade Exploration, Section 27, 47-26, with Mr. Pardee, Engineer for the Michigan State Tax Commission. I also visited the Company's Empire Mine property and wrote a report on the possibility of lean siliceous ores available here for open pit extraction.

In March, I prepared a report with Mr. Jopling on the possibility of lean siliceous ores on the Company's Estate which could be mined by open pit.

In April, I examined the N½ of the NE¼ of Section 26, 43-35 at Iron River which was offered to us. I collected representative samples

of ore and wall rocks at Republic which were sent to the Electrical Prospecting Corporation of America at New York to be tested for their relative electric conductivity in connection with their method of prospecting for ores by the use of a high frequency electric current. Nothing further has developed along this line as far as this Company is concerned but the method has decided merit under certain conditions. I made a map of the caving limits in anticipation of the extraction of the ore under the Race Track property at Negaunee. I prepared maps and a report on the Michigan Mineral Land Company's mineral holdings for our Cleveland office in connection with its work with the Federal Government, Valuation Section. Mr. Jackson and I examined the Mary Charlotte Mine workings and prepared a report on the property which was accompanied by maps.

In May, Mr. Jopling and I examined the property offered us by Mr. J. H. Quinn in Section 32, 41-30, Dickinson County, about eight miles Northwest of Iron Mountain, and wrote a report on it. I accompanied Messrs. Mather and Elliott on a field examination of the current operations on the Cascade Range, and more particularly the Richmond and Maitland open pits.

In June, Mr. Jopling and I examined the property offered to us by Mr. Louis Duval, the NW¼ of Section 14, 43-32, Delta County, about six miles South of Trenary, and wrote a report on it.

In July, I spent ten days in Duluth and Hibbing making estimates relative to the possible operation of Buffalo and Susquehanna Mines in connection with our Boeing property. Mr. Barber and I joined with Pickands, Mather & Company, operating officials, in a report on the proposition. This property, I understand, has been taken over by the M. A. Hanna Company, who also represent other partners in the deal.

In August, September and October, I spent a large part of the time on the Mesabi Range with headquarters at Hibbing. I examined the Holman-Brown properties offered to us by the Canisteo Mining Company, that is, the Congdon Estate of Duluth, and made many estimates which

are included in Mr. Barber's report of November 16th covering these properties.

In December, I made some additional estimates on the Holman-Brown proposition, which Mr. Barber embodied in his report of December 29th.

M. C. Drake. Mr. Drake continued as assistant geologist throughout the year. He made regular underground geological surveys at all the Company's operating mines in Michigan, except those in Negaunee, and posted these surveys on the geological maps and cross-sections. He frequently accompanied and assisted me in the underground geological surveys of the new development work in the various mines. He geologized and sampled the lean siliceous ore outcrops in Sections 13 and 24, 47-27, South of the Ogden pit; also the large occurrence of this material near the center of the NW¼ of the NW¼ of Section 26, 47-27. He checked over some of the geology in the Cliffs Shaft Mine, which was mapped years ago, and where a number of errors were found and geologized the lower levels of the old Incline Mine. With this information he constructed a longitudinal section including the territory between the Incline Mine and the Easternmost workings of the Cliffs Shaft Mine in order that drilling to locate the probable Westerly continuation of the Incline ore body may be carried on intelligently. He made a longitudinal cross-section through the workings of the Republic Mine in the vicinity of the Pascoe Shaft to aid in planning a campaign of drilling there. He also accompanied and assisted Mr. Jackson and me in our examination of the Mary Charlotte Mine.

E. A. Allen. Mr. Allen continued as an assistant in the Department during the year. At times, however, he also assisted several of the engineers with their surveys and drove the Dodge truck. The major part of his time was spent in collecting, sampling and filing diamond drill samples from the current explorations. He assisted Mr. Drake in underground geological surveys and on the surface South of the Ogden Mine. He sampled all the outcrops of iron formation in Section 4 and a part

of Section 5, 47-27 in our survey of the Company's Estate in quest of easily accessible lean siliceous ore. He made regular monthly carbon reports and the annual inventory of diamond drill equipment. He also surveyed the current drill holes with the Maas Compass wherever necessary and made thin sections of rock specimens for microscopic examination whenever called upon to do so.

Gustav Afuhs. Mr. Afuhs continued as draftsman throughout the year. His work, as formerly, has, in part, consisted in preparing cross-sections of drilling and in posting the current extensions on the underground geological maps and cross-sections of all the Company's operating mines on the Michigan ranges, making new maps and cross-sections as they became necessary. He spent a large part of his time the past year making new complete sets of geological cross-sections of the Athens, Barnes-Hecker, Cliffs Shaft and Maas Mines to be used exclusively for photographic records and more particularly for the annual reports to the State Tax Commission. He has, at various times, prepared geological white print maps of portions of the Michigan Mineral Land Company's holdings for Mr. Prickett of Sidnaw. He prepared some of the maps to accompany Mr. Barber's report of October 16th on the Holman-Brown properties. He also made a geological composite tracing of the more important levels of the Pascoe Shaft workings in the Republic Mine and a geological longitudinal section through the Spies-Virgil Mines. He colored in the annual and Tax Commission report sheets of this Company's drilling for the year and the legend sheets to accompany them. He also made copies of drill results, for our outside exploration files, of all the important land offers that were received during the year and spent the rest of his time on the routine work of the office.

SURFACE GEOLOGICAL SURVEYS.

The only geological surveys of surface areas that were made during the year were those in Sections 13 and 24, South of the Ogden Mine, in the NW¼ of the NW¼ of Section 26, and in Sections 4 and 5, all in 47-27. The surveys were made principally to locate and sample the outcrops of iron formation in quest of areas of lean siliceous ores on the Company's Estate which could be mined economically by the open pit method.

UNDERGROUND GEOLOGICAL SURVEYS.

ATHENS MINE.

The Athens Mine worked five day shifts per week throughout the year and continued to be one of the Company's large producers. Most of the work was confined to mining and the bulk of the ore came from the territory just above the 6th level. The South crosscut, started last year on the 4th level in Mitchell Lot 11, was completed and four raises put up to the hanging from which mining was started during the year. The 830 crosscut, a Southeast crosscut on the 8th level, which was started last year, was also completed. Five raises were put up from it to the 575' sub-level, which is the first sub above the 6th level, and a sixth raise started. Three raises were put up to this sub and a fourth started, all from the 850 crosscut; also two raises were put up to the same sub from the main drift. All these raises were connected by drifts and crosscuts on the 660' sub, which was opened for that purpose during the year. This sub is about half way between the 6th and 8th levels. Both the geological maps and cross-sections were posted periodically from the information furnished us by Mr. Nicolson, Engineer at the property, and formerly an assistant geologist.

BARNES-HECKER MINE.

This mine was operated 12 shifts per week until August 28th and ten shifts per week for the balance of the year. Practically all the work consisted of mining above the 1st level in both the East and West lenses, and under the flattened hanging territory above the 2nd level. A raise was put up from the 815' sub-level to the 1st level, all in ore, in the West lens. This affords another connection and traveling road between the 1st and 2nd levels. The mine is still making considerable water but the amount has declined steadily since last spring. Geological surveys have been made regularly.

CLIFFS SHAFT MINE.

The Cliffs Shaft Mine continued to operate on a five shift per week basis throughout the year and maintained a large output. Practically all work was confined to mining in areas already pretty definitely defined. Since acquiring a lease from the Lake Superior Iron Company on the territory in Section 3 lying immediately North of the mine, stoping has commenced in the ore crossing the line on the 1st level "A" Shaft and raises are being put up into it from the 7th to the 6th level "A" Shaft. Some new ore was developed by drilling in the Southeast deposit on the 6th and 7th levels "A" Shaft; also at the East end of the latter level and both North and South of the drift on the Southeast side of the 9th level "A" Shaft. Development work is also continuing in the ore at the West end of the 15th level "B" Shaft. We have made geological surveys of the current extensions regularly and have nearly caught up geologizing areas that had to be omitted several years ago.

HOLMES MINE.

This mine operated five shifts per week the entire year. A new lens of ore was discovered in the footwall jasper and the lean ore area on the 3rd level, and was stoped up for a distance of about 140', or 40' above the 2nd level. Aside from this, the work was all confined to mining the ore already developed and was all between the 2nd and

3rd levels. Geological surveys were made regularly.

MAAS MINE.

The Maas Mine was closed from July 1st to October 15th while the shaft was stripped down from the ledge to a point 48' below the 3rd level and re-equipped as practically a standard size shaft. Below this it was cut standard size when sunk. The mine operated five shifts per week the balance of the year. The 245' tramming sub-level was advanced along the Negaunee Mine boundary and a raise put up to the 3rd level for ventilation. The rest of the work was confined to mining ore already developed. The geological maps and cross-sections were posted periodically from data furnished us by Mr. Moulton, Engineer at the property.

MORRIS LLOYD MINE.

This mine worked five shifts per week throughout the year. In the Lloyd Mine all work was confined to mining in ore areas already developed and has progressed down to a point from 70' to 100' above the 3rd level.

In the East Lloyd Mine, besides the regular mining, development of the ore along the North side of the main dike and above the 1290' sub-level was started. Four raises have been put up in it. Two went up 90', one 42' and the other 35'.

Mining continued in the old areas of the Morris Mine from above the 4th level, on the subs between the 4th and 6th levels, and on the 6th and 7th levels. New ore was developed on the 870' sub, South of the shaft and about 55' below the 3rd level from raises put up from the 4th level. The ore here is approximately 300' long by 30' wide. Mining in it has commenced 15' under the 3rd level. The ore discovered on the 7th level by drill holes Nos.81 and 90 in 1924 has been partly outlined on that level and the development of the new ore on the 6th level directly Southwest of the shaft, which was discovered by drill holes Nos.100 and 101 during the year, has been commenced. Geological surveys were made at regular intervals.

GEOLOGICAL DEPARTMENT.

NEGAUNEE MINE.

The Negaunee Mine continued to be the largest producer on the Range. It worked ten shifts per week from July 1st to October 15th while the Maas Mine was closed, to take care of themen from there. Five shifts per week were worked the balance of the year. Most of the work was confined to regular mining operations in areas already developed.

One raise was put up from the 11th to the 10th level to drain the water at the point where it connects with the 2nd level Maas Mine. Several intermediate raises were put up from the 11th to the 460' sub-level to assist in mining with scrapers. Development work was also resumed on the 12th level and standard and storage and measuring pockets wereput in to serve this level at the shaft. The geological maps and cross-sections were posted periodically from information furnished us by Mr. Moulton, Engineer at this property.

OGDEN MINE.

An additional demand for lean siliceous ores resulted in the re-opening of the old Ogden pit in Section 13, 47-27. Stripping, construction of buildings, and the accumulation of equipment commenced May 11th and the production of ore on June 4th. Ore was mined by steam shovel continuous up to and including November 4th. Some stripping was done after this in preparation for next season's output. A total of 64,822 tons of siliceous ore were produced and shipped during the season. At first, the Keystone churn drill was used to drill holes for blasting the pit face. This machine was later replaced by a Cyclone churn drill, which proved to be more satisfactory. Mr. Allen, Engineer at the property, prepared a sample map of the cuts as taken. A geological survey of the pit and the surrounding area was made and the results posted on a map of the property.

REPUBLIC MINE.

The Republic Mine has worked ten shifts per week most of the time and 12 shifts per week part of the time, except for several

shutdowns due to accidents to equipment, caves in the hanging of the Pascoe Shaft, and other minor causes.

Development work was completed on the 2770' level Pascoe Shaft, the shaft sunk to the 2840' level and the level partly developed. Work was commenced on this level driving a drift into the hanging wall from which a campaign of drilling will be conducted to explore for the downward extension of ore in this trough.

The drift along the hanging wall on the 2570' level was extended Northwesterly along the hanging contact about 270'. No ore was encountered. When this drift has progressed far enough, a connection will be made with the bottom of the winze on the 2370' level No.9 shaft and further development work done in this territory.

Practically all the ore produced has come from the stopes already opened at the beginning of the year and all in the vicinity of the Pascoe Shaft. Geological surveys were made regularly.

SPIES-VIRGIL MINE.

This property operated 12 shifts per week throughout the year. Work in the Spies was confined to mining in the back and floor pillars of the old shrinkage stope above the 1st level and in stoping above the 3rd level on the South side and approaching the Virgil boundary. In fact, some ore has been stoped here from the Virgil side of the line.

All the work in the Virgil was development. The 4th level was extended 765' and cut 200' of ore in the main ore body. A crosscut was driven Northwesterly at right angles and two parallel Southwesterly drifts started from it. Both of these encountered the main ore body and were driven ahead in it as the year closed. A number of raises were put up and the 90', 120', 155', 165', and 245' sub-levels partly developed in ore. A drift has been started towards the shaft on the 245' sub which will become the new 5th main level. A station is being cut at the shaft half way between this elevation and the 3rd level and this will be the new 4th level. The present 4th and 5th levels

will become the 6th and 8th, respectively. The old 5th level was advanced 305' in the first part of the year. It cut 190' of ore, high in sulphur, and consequently of no commercial value, at least at present. Work on this level, therefore, was suspended indefinitely. Geological surveys were made at this property very frequently on account of their particular importance in planning the development work.

STEPHENSON MINE.

The Stephenson Mine operated five shifts per week throughout the year. A few pillars were mined above the 4th level and some above the 5th level. The latter were on the South side of the level on Section 29. Most of the ore, however, was mined from the sub-levels between the 5th and 6th levels. A footwall drift was driven on the Northeast side of the 6th level and three raises put up. Development of the new 7th level from the winze continued. Three raises were being put up as the year closed and two had encountered the main ore body. A sump was completed below the new 8th level at the winze. Geological surveys were made at irregular intervals, but Mr. Sterling, Engineer at the property, has supplied us with additional geological data so that the geological maps and cross-sections are posted up to date.

OPTIONS AND LEASES.

No options for exploring were acquired during the year.

Lease No.47 on the Helmer Mine at Kinney, Minnesota, covering the NE¼ of the NE¼ of Section 14, 58-19, was surrendered on January 26, 1925.

OLIVER EXCHANGE.

Mining leases were signed by this Company on January 26, 1925 as follows:

From the Lake Superior Iron Company, Lot 2 Section 3, 47-27. This property lies immediately North of the Cliffs Shaft Mine.

From the Lake Superior Iron Company the

SE¼ of the NE¼ of Section 3, 47-27,
NW¼ of the NE¼ of " 3, "
NE¼ of the NW¼ of " 3, "
SW¼ of the NW¼ of " 3, "

From the Oliver Iron Mining Company, the Race Track property at Negaunee.

The so-called Adams Strip, being the South two thirds of the old D. S. S. & A. Railway right of way between the Maas and Negaunee Mines was acquired by deed from the Oliver Iron Miming Company. The Oliver Iron Mining Company's interest in fee, both surface and mineral, in the Race Track property was deeded to this Company.

This Company leased to the Lake Superior Iron Company the Barnum Mine, the S½ of the NE¼ of Section 9, 47-27. This Company also assigned to the Oliver Iron Mining Company stock representing its quarter interest in the Lake Superior Iron Company.

EXPLORATIONS.

Drilling explorations were carried on during 1925 in the following districts and mines:

FROM SURFACE.	DISTRICT.	RANGE.
	Cascade.	Cascade.

FROM UNDERGROUND.

MINE.	DISTRICT.
Cliffs Shaft	Ishpeming
Morris	North Lake
Republic	Republic
Virgil	Iron River.

Table IV, which follows, gives the footage drilled, the ore encountered, and the cost per foot of drilling for both surface and underground explorations. It will be noted that the average cost of surface drilling was $6.95, excluding certain items which are not actual drilling expense but which are charged to the explorations. By including these items, the average cost was $8.27 per foot. The

average cost of underground drilling in the same way was $2.43 per foot and $2.71 per foot, respectively. The average cost of all drilling was $2.84 per foot and $3.22 per foot, respectively.

As the Cascade Exploration was the only surface work done during the year, the cost of this work represents the cost of all surface drilling. This was very high on account of a large moving expense compared to the total footage drilled. Roads had to be cut through the woods and considerable difficulty was met in getting the equipment in and out; also the holes were all shallow, necessitating frequent moving of the equipment. The cost of underground drilling has steadily decreased the last several years and is over 15% less in 1925 than in 1924. Some of this decrease is due to the influence of the cost of the Virgil drilling on the total cost. This work was done with the new deep drilling machine made by the Denver Rock Drilling Company at a very low cost as no carbon was used. It is limited, however, to relatively soft ground.

Table V, also shown below, gives a comparative cost per foot of total drilling for the past five years:

TABLE IV.

SUMMARY OF DRILLING FOR 1925.

EXPLORATION.	DESCRIPTION. SEC. T. R.	STAND-PIPING FT.	CHURN DRILLING FT.	DIAMOND DRILLING FT.	TOTAL FT.	FIRST CLASS ORE FT.	SECOND CLASS ORE FT.	LEAN ORE FT.	TOTAL COST "A".	COST PER FT. "A".	TOTAL COST "B".	COST PER FT. "B".
					SURFACE DRILLING.							
Cascade,	27, 47-26	243	5	821	1,069			99	$8837.52	$8.27	$7427.35	$6.95
					UNDERGROUND DRILLING.							
Cliffs Shaft Mine,	9 & 10, 47-27			2420	2,420	213	184	176	8250.96	3.41	7375.52	3.05
Morris Mine,	1 & 2, 47-28			2352	2,352	148	212	228	5624.48	2.39	4985.32	2.12
Republic Mine,	7, 46-29			3241	3,241	127	5	99	11218.35	3.46	10506.60	3.24
Virgil Mine,	24, 43-35			2626	2,626	1419	175	112	3746.52	1.43	2992.79	1.14
Total Underground Drilling,				10639	10,639	1907	576	615	$28840.31	$2.71	$25860.23	$2.43
Grand Total Drilling,		243	5	11460	11,708	1907	576	714	$37677.83	$3.22	$33287.58	$2.84

NOTE:- Cost "A" includes taxes, office expense, engineering, analysis, legal, personal injury, etc.
Cost "B" excludes " " " " " " " " " (To compare with contract price).

There was no contract drilling done during the year.

TABLE V.

SUMMARY OF FOOTAGE DRILLED AND COST PER FOOT OF DRILLING FOR PAST FIVE YEARS.

YEAR.	TOTAL FEET DRILLED.	COST PER FOOT "A".	COST PER FOOT "B".
1921	16,011	$5.14	$4.37
1922	7,634	3.79	3.44
1923	9,091	3.65	3.38
1924	11,007	4.10	3.54
1925	11,708	3.22	2.84

SURFACE EXPLORATIONS.

CASCADE RANGE.

CASCADE DISTRICT.

SECTION 27, 47-26, CASCADE EXPLORATION.

Drilling for lean siliceous ore on this property, which was begun in August 1924, was continued until the end of March, 1925.

Fifteen holes had been completed and the sixteenth started by the first of the year. They were all located in the SW¼ of the SE¼. Eight more holes, spaced at more or less regular intervals, were drilled on this forty but failed to find an appreciable amount of additional ore.

Six holes, spaced at 400' intervals on two parallel North-South lines 400' apart, were drilled on the NW¼ of the SE¼ and one hole in the SW¼ of the NW¼. Only one of these, No.30, encountered ore of importance and this hole was near the limiting edge of the territory in which open pit mining would be possible. Practically all of the iron formation drilled this year was interbedded with seams of quartzite of varying thickness and was unfavorable for ~~lean~~ a lean siliceous ore body. Consequently all further exploring has been abandoned. The only ore of importance discovered was that cut in holes Nos.7, 10 and 13 in 1924 and is the Southeasterly continuation of the Hanna Company's ore body which crosses the S½ of the SW¼ of the section. There is probably between 500,000 and 750,000 tons on our side of the line, - not enough for an independent operation at this time.

U N D E R G R O U N D E X P L O R A T I O N S.

CLIFFS SHAFT MINE.

One diamond drill continued operating in the Cliffs Shaft Mine throughout the year. Eighteen holes were completed and another started and all were drilled horizontally.

Hole No.344, which was drilled due South from the South drift on the 6th level "A" Shaft to explore the territory to the South boundary of the property, was in greenstone at a depth of 70' on the first of the year. This proved to be the footwall and the hole was bottomed in it at 130'. Hole No.345 tested the ground to the North from the opposite side of the same drift and encountered the slate hanging wall without finding ore of a merchantable grade.

Holes Nos.346 and 347 were drilled due North and South, respectively, from the same drift and about 170' East of the first two holes. Hole No.346 had 2' of good ore at the start and then entered the slate hanging. The South hole, No.347, encountered good ore from 13' to 20½' and from 25' to 33'. This is being developed now.

Four holes, Nos.348 to 351, were drilled from the Southeast deposit on the 7th level "A" Shaft. Nos.348 and 351 were drilled South and Nos.349 and 350 North. No.348 had 10' of good ore right at the start but No.351 encountered siderite,- presumably footwall material. No.349 cut three runs of ore before encountering the hanging. These were from 5' to 12', 47' to 58', and 67' to 76'. A drift had just been started at the end of the year to develop this ore.

Two holes, Nos.352 and 353, were drilled North and South, respectively, from near the East end of the main drift on the 7th level "A" Shaft. No.352 was drilled to explore for the Easterly continuation of a fault vein, sometimes called the North vein, but did not find it. Six feet of good ore were encountered, however, from 33' to 39'. No.353, on the other hand, cut 28' of good ore right at the beginning of the hole; then encountered hanging wall slate.

Nos.354 and 356 were drilled North and No.355 South from the Southeast side of the 9th level "A" Shaft. No.354 cut ore from 35' to 45' and No.356, presumably the same lens of ore, from 5' to 21', except for a seam of leaner material from 13' to 17'. No.355, on the other side, encountered ore from 14' to 22', 36' to 50' and 58' to 68'. The ground between these three seams will average better than 50% so that much of it probably will be mined.

No.357 was drilled Southwesterly from near the West end of the 9th level "B" Shaft to explore for a Westerly continuation of the fault vein. Two narrow seams of ore were encountered, one from 115' to 120' and the other from 125' to 130'. Twenty feet of 52% material preceeded the first seam.

Holes Nos.358, 359 and 360 were drilled from the Southwest end of the 11th level "B" Shaft. No.358 was drilled Southwesterly to explore for the fault vein at this elevation. The other two holes were drilled North to the hanging. No.358 encountered the fault vein ore from 118' to 130'. No.359 had one foot of ore at the start and No.360 4' of ore likewise at the beginning. Eight feet of ore were also encountered in the latter hole from 45' to 53' just at the hanging contact.

No.361 was drilled South from the South side of the 12th level "B" Shaft to explore for the same fault vein at this elevation. Ore in this vein was encountered from 40' to 52'. Hole No.362 was then located 200' farther West and is being drilled South to explore this same fault territory. It was drilling in hard ore jasper at a depth of 10' on the last of the year.

MORRIS MINE.

One drill operated in the Morris Mine up to the early part of August when exploring was discontinued for the time being. Eight holes were completed and all were drilled horizontally.

Hole No.94, which was drilled due South from the South end of the drift from the shaft on the 4th level, had just cut the fault dike

at the beginning of the year. It was bottomed 5' on the other side of the dike. This is the first of a series of five holes which were drilled to outline what we believe to be the Westerly extension, along the pitch, of the fault crotch forming the East limit of the Lloyd ore body. This crotch is formed by the intersection of a dike with the slate footwall, the dike approximately coinciding with a fault that has displaced the footwall and iron formation considerably. We believe it is this structure that has influenced the concentration of the ore encountered in holes Nos.29 and 34, just below the 6th level.

Holes Nos.95, 97, 98 and 99 were drilled Southeasterly from this same locality. No commercial ore was encountered but the crotch was quite definitely outlined and the formation found to be considerably enriched. It is difficult to get a hole into the end of this crotch, the most favorable position for ore, on account of the relative position of the drifts from which the drilling must be done. We shall probably attack this area from a different angle as soon as drilling can be resumed in the mine.

Hole No.96 was drilled Northwesterly from the 7th level on lease No.25 to further explore a possible fault crotch formed by a set back in the slate footwall. No ore was encountered. Holes Nos.100 and 101 were drilled Southeasterly from the 6th level on Cleveland-Cliffs Iron Company land just East of No.9 lease to test the same fault crotch at this elevation which was outlined by the five holes on the 4th level mentioned above. Holes Nos.29 and 34 drilled several years ago, together with the information on structure obtained from the 4th level holes, indicated that the ore found in Nos.29 and 34 would extend up to and above the 6th level. Both Nos.100 and 101 encountered good ore. Hole No.100 cut it from 50' to 75' and from 155' to 170'. It also encountered considerable lean ore. Hole No.101 cut it from 15' to 35', 40' to 70' and 85' to 115'. This ore is continuous except for two dikes from 35' to 40' and from 70' to 85'. The entire iron formation beyond the ore and all the way to the fault dike contact