1926

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Mining Department

Annual Report of General Manager

For Year ending December 31st 1926

#1997

1928

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THE CLEVELAND-CLIFFS IRON COMPANY

MINE DEPARTMENT - MANAGER'S ANNUAL REPORT.

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CROSS INDEX BY MINES

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CROSS INDEX BY MINES

	STEPHEN-SON	PRINCE-TON	GWINN	AUSTIN	GARD. MACK.	FRANCIS	GWINN DISTRICT MINES
GWINN DISTRICT MINES:							
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2 Production, Shipments & Inventories	188-190	229-	236	246-248	-	277	-
3 Analysis	190	230	236-7	248	272-3	-	-
4 Estimate of Ore Reserves	191-3	230	237-8	248-9	274	-	-
5 Labor and Wages	193-4	231	238-9	250-1	274	277	282
6 Surface	195-7	232	239-42	252-3	-	-	-
7 Underground & Open Pit	198-212	232-3	242	253-260	-	277-9	-
8 Cost of Operating	213-225	233-5	242-4	261-69	275-6	-	282
9 Explorations & Future Explorations	-	-	-	-	-	-	-
10 Taxes	225	235	244	270	276	279	283-5
11 Accidents & Personal Injury	-	-	-	-	-	-	-
12 New Construction & Proposed New Construction	-	-	-	-	-	-	-
13 Equipment & Proposed Equipment	226-7	-	244	270-1	-	-	286-7
14 Maintenance & Repairs	228	-	-	-	-	-	-
15 Power	-	-	-	-	-	-	-
16 Water Supply	-	-	-	-	-	-	287-8
17 Mine Location-Condition of Premises	-	-	-	-	-	-	288-9
18 Nationality of Employes	228	-	-	271	-	-	-
19 Club House, County Park, Future of Gwinn	-	-	-	-	-	-	290-98

OTHER MICHIGAN MINES & MINNESOTA MINES:	REPUBLIC	SPIES-VIRGIL	WADE	HILL-TRUMBULL	BOEING
1 General	299-300	330	362	367	383
2 Production, Shipments & Inventories	300-4	330-3	362	367-8	383-86
3 Analysis	305	333	363	369	386
4 Estimates of Ore Reserves	305-7	333-4	363	369-70	387-8
5 Labor and Wages	307-8	334	364	370	388-9
6 Surface	308-10	335	364	371	390
7 Underground & Open Pit	310-317	335-7	365	371-74	390-5
8 Cost of Operating	318-24	337-44	-	375-77	396-9
9 Explorations & Future Explorations	325-6	345-51	365	378	400
10 Taxes	326	352-55	365	378-79	400
11 Accidents & Personal Injury	326-28	355-56	-	379	400
12 New Construction & Proposed New Construction	-	356-7	-	379	400
13 Equipment & Proposed Equipment	-	358	-	379	400
14 Maintenance & Repairs	-	359	365	379-80	401
15 Power	328	359-60	-	-	-
16 Water Supply	-	-	366	-	-
17 Mine Location-Condition of premises	329	360-61	366	-	401
18 Nationality of Employes	329	361	366	381	401
19 Washing Plant Operations	-	-	-	381-2	-

Ishpeming, Michigan,

January 1, 1927.

Mr. Wm. G. Mather, Pres.,

Cleveland, Ohio.

Dear Sir:-

In Mr.Duncan's absence I beg to submit the report of the operations of the Mining Department for the year 1926.

The inventories, maps, and statements relative to the 1926 report have gone forward to you under separate cover.

The colored portions of the maps show the work for the year. The reports of the different mines of the Company were made by the Superintendents in charge, and the reports of the Engineering, Mechanical, Electrical, Geological, Safety, and Welfare Departments by the heads of these departments.

The one thing which has overshadowed everything else is the Barnes-Hecker disaster of November 3rd. This terrible catastrophe has saddened all of our hearts.

The Republic and Barnes-Hecker have worked two 8-hour shifts 5 days per week. The Spies-Virgil and Boeing Underground two 8-hour shifts 6 days per week. There was no curtailment in the operating time at the Hill-Trumbull, Boeing, and Ogden Pits. All of the other mines have worked one 8-hour shift 5 days per week.

The following statement shows a comparison of all of the Company mines for the year 1926 as compared with 1925:

YEAR	PRODUCTION	TONS PER MAN	COST ON CARS	AVG.RATE PER DAY	LABOR COST PER TON
1925	3,166,062	4.635	2.370	5.13	1.107
1926	3,366,557	4.85	2.420	5.12	1.054
Difference	200,495	.215	.05	.01	.053

The only outstanding lease is to the Empire Iron Company, covering the SW¼ of Section 19-47-26. This property has been sublet to the Clement K. Quinn Company, who opened it in 1926 and produced 26,595 tons.

Yours truly,

For Vice President and General Manager.

CLIFFS SHAFT MINE

ANNUAL REPORT

YEAR 1926.

1. GENERAL:

The Cliffs Shaft Mine began the year with development behind production, because of the forced program of the previous season, but during the year development was pushed more rapidly and more successfully, and at the end of the year the mine is in better shape than it has been at this time of year for the past three years.

Although the number of days worked per week remains the same, changes in equipment underground and on surface have increased hoisting capacity materially so that more contracts can be worked and greater production maintained.

Development has been carried on principally in three areas in A shaft, the O. I. M. Co. lease on Sec. 3, the North Vein on the sixth level, and the Southeast Deposit, and in B shaft the western part of the Main Vein from the thirteenth to the fifteenth level. Substantial extensions have been made in the known ore-limits in these places.

In increasing the number of contracts, the increases have been in the contracts working in A shaft, as this part of the mine has the largest ore-reserves and the best prospects for more ore. The number of gangs in B shaft remains practically unchanged, and hoisting is balanced between the two shafts by tramming ore from A shaft territory to B shaft on the bottom level.

On account of the late spring early shipments were delayed, but nevertheless all the stock-piles were cleared up for the first time in many years.

2. PRODUCTION, SHIPMENTS & INVENTORIES:

a. Production by Grades:

Grade	Product Tons	Overrun Tons	Total Tons
Cliffs Shaft Lump	206,183	7,320	213,503
Cliffs Shaft Crushed	87,661	721	88,382
Total Cliffs Shaft	293,844	8,041	301,885
Bancroft Lump	26,225	668	26,893
Bancroft Crushed	11,304	171	11,475
Total Bancroft	37,529	839	38,368
Total Ore	331,373	8,880	340,253
Rock			20,902

As the stock-pile overrun was all accumulated after the close of the 1925 shipping season it really belongs in 1926 production, and represents results actually obtained. Dividing the ore by shipping grades, production was as follows:-

Lump Ore	240,396	Tons
Crushed Ore	99,857	"
Total Ore	340,253	Tons

70.7% of the product was lump ore and 29.3% crushed.

Of the total production 88.7% was Cliffs Shaft ore and 11.3% Bancroft.

All the rock was dumped underground.

CLIFFS SHAFT MINE

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Comparison of Product for 1925 and 1926.

	1926 Tons	1925 Tons	Increase Tons	Decrease Tons
Production	331,373	318,601	12,772	
Stockpile Overrun	8,880	55,755		46,875
Total	340,253	374,356		34,103
Percentage of Lump	70.7	67.8	2.9	
Percentage of Bancroft	11.3	4.9	6.4	

In 1925 all the ore was screened over 3-inch round holes, but in 1926 on May 30th the screen-plates were changed to 2½ inch holes, and this size of hole was used for the rest of the year.

The mine worked five days a week on single shift throughout the year except in October and November. In these months it worked six days a week. The total number of days worked was 267 and the average daily product was 1,241, exclusive of stock-pile overrun. In 1925 the mine worked 260 days, and produced 1,225 tons per day, exclusive of overrun.

b. Shipments:

Grade	Pocket Tons	Stkple Tons	Total Tons	Total Last Yr. Tons
Cliffs Shaft Lump	137,934	97,938	235,872	260,948
Cliffs Shaft Crushed	48,236	41,188	89,424	147,650
Total Cliffs Shaft	186,170	139,126	325,296	408,598
Bancroft Lump	15,638	7,174	22,812	8,783
Bancroft Crushed	5,739	4,175	9,914	4,615
Total Bancroft	21,377	11,349	32,726	13,398
Total Ore	207,547	150,475	358,022	421,996
Total Last Year	196,916	225,080	421,996	
Decrease in Shipments			63,974	

Shipments to the dock began on April 19th and ended on November 20th. All-rail shipments were made in every month of the year.

c. Stockpile Inventories:

Grade	Tons
Cliffs Shaft Lump	22,271
Bancroft Lump	3,752
Total Lump	26,023
Cliffs Shaft Crushed	9,556
Bancroft Crushed	1,715
Total Crushed	11,271
Total Ore	37,294

On Dec. 31, 1925 there was in stock 55,063 tons, 17,769 tons more than this year.

There is ample room for stocking ore.

CLIFFS SHAFT MINE

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d. Division of Product by Levels:

Level	A Shaft Tons	B Shaft Tons	Total Tons
First	14,653	29,822	44,475
Second	1,001	757	1,758
Third	6,246	4,277	10,523
Fourth	15,546	4,209	19,755
Fifth	14,052	-	14,052
Sixth	24,883	15,481	40,364
Seventh	55,985	12,510	68,495
Eighth	13,820	14,004	27,824
Ninth	8,074	3,311	11,385
Tenth	28,162	479	28,641
Eleventh	12,105	12,681	24,786
Twelfth	5,015	8,345	13,360
Thirteenth	-	14,280	14,280
Fourteenth	-	16,022	16,022
Fifteenth	-	4,533	4,533
Total	199,542	140,711	340,253
Rock	8,790	12,112	20,902

Of the Bancroft Ore tons came from the first level and from the seventh level, both in A shaft.

e. Production by Months:

	Days	C. S. Lump	C. S. Cr.	Banc. Lump	Banc. Cr.	Total Tons	Rock
January	21	14,143	7,088	1,310	655	23,196	2,172
February	20	12,577	6,273	1,254	626	20,730	2,030
March	23	15,499	7,730	1,706	854	25,789	2,962
April	22	15,688	7,814	1,484	742	25,728	2,228
May	21	15,288	6,925	2,007	859	25,079	1,652
June	22	16,066	6,629	2,305	963	25,963	1,600
July	22	17,893	6,926	2,604	1,119	28,542	1,166
August	22	18,566	6,973	2,663	1,147	29,349	746
September	23	19,638	7,398	2,811	1,181	31,028	962
October	26	23,717	9,087	3,246	1,136	37,186	1,800
November	23	19,474	7,272	2,256	921	29,923	1,582
December	22	17,634	7,546	2,579	1,101	28,860	2,002
Year	267	206,183	87,661	26,225	11,304	331,373	20,902
Stkple Overrun		7,320	721	668	171	8,880	
Total		213,503	88,382	26,893	11,475	340,253	20,902

CLIFFS SHAFT MINE

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YEAR 1926.

2. PRODUCTION, SHIPMENTS & INVENTORIES: (Continued)

f. Ore Statement:

	C. S. Lump	C. S. Cr.	Banc. Lump	Banc. Cr.	Total Tons	Total Last Year
On Hand Jan. 1, 1926	42,890	10,043	1,421	709	55,063	102,703
Output for Year	206,183	87,661	26,225	11,304	331,373	318,601
Transferred	1,750	555	1,750	555	-	-
Stockpile Overrun	7,320	721	668	171	8,880	55,755
Total	258,143	98,980	26,564	11,629	395,316	477,059
Shipments	235,872	89,424	22,812	9,914	358,022	421,996
Balance on Hand	22,271	9,556	3,752	1,715	37,294	55,063
Decrease in Output					34,103	
Decrease in Ore on Hand					17,769	

1926 - 1-8 Hour Shift, 5 days per week, January 1st, to October 1, 1926.
1-8 Hour Shift, 6 days per week, October 1, to December 1, 1926.
1-8 Hour Shift, 5 days per week, December 1, to December 31, 1926.

1925 - 1-8 Hour Shift, 5 days per week, January 1, to December 31, 1925.

g. Delays:

Date	Hours	Tons Lost	Cause	Cost
Jan. 4	1¾	200	Lump stockpile car went over the dump.	$ 100.71
" 9	1	125	Hoisting sticky dirt in A shaft.	-
" 12	½	63	A shaft top-tram car jumped the track.	1.20
" 12	½	62	Eye-bolt broke on casting in crusher building.	10.83
" 22	1	125	Screen motor in crusher building ran hot.	1.25
Feb. 2	½	100	Screen motor ran hot.	.75
" 2	½	100	A shaft top tram car jumped the track.	1.20
" 8	½	75	Axle broke on lump stockpile car.	8.70
" 12	1	125	10th level A shaft pocket door jammed.	1.10
" 17	2½	150	Electric motor 10th level A shaft off the track.	2.50
Mar.16	1	75	Gate broke 10th level A shaft.	13.50

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2. PRODUCTION, SHIPMENTS & INVENTORIES:

g. Delays: (Continued)

Date	Hours	Tons Lost	Cause	Cost
April 23	1¼	175	No current. Wire burned out.	-
May 4	1	100	Skip pulled out air lift at 1st level B shaft.	$ 4.70
" 12	½	75	Screen blocked in crusher building.	-
" 21	¾	50	Fatal accident to Isaac Setala.	-
" 21	1½	175	Pulley broke in crusher building.	11.84
" 24	1¼	150	Disc blocked in crusher building.	2.60
" 24	4	500	Isaac Setala's funeral.	-
June 4	3	150	B shaft turn-sheave stand broke.	85.56
" 7	1	125	No current.	-
" 14	1	125	No current.	-
" 18	½	50	A shaft pocket blocked.	.90
Aug. 30	1	100	Liner caught between B shaft skip and shaft runner.	8.55
" 30	½	50	Rope broke on top-tram air-lift.	1.50
Sep. 3	1	130	No current.	-
" 3	½	70	Casting broke in crusher building.	2.30
" 14	1	125	Rope for dumping A shaft top tram car broke.	2.60
" 17	1½	200	No current.	-
Oct. 1	½	65	Casting broke in crusher building.	2.20
" 1	½	60	Door opened on A shaft top-tram car.	1.10
" 18	1	125	B shaft skip stuck in the dump.	3.40
Nov. 9	1	125	Putting on new top-tram car at B shaft.	3.10
Year	35	3925		$ 272.09

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2. PRODUCTION, SHIPMENTS & INVENTORIES: (Continued)

h. Delays Due to Lack of Current:

Date	Hours	Tons Lost	Cause
April 23	1¼	175	Wire burned out at sub-station.
June 7	1	125	Main-line trouble.
" 14	1	125	Main-line trouble.
Sept. 3	1	130	Main-line trouble.

3. ANALYSIS:

a. Average Mine Analysis on Output:

Grade	Iron	Phos.	Silica
Lump Cliffs Shaft	60.29	.096	5.74
Crushed Cliffs Shaft	57.74	.100	8.06
Bancroft Lump	60.02	.115	5.39
Bancroft Crushed	58.54	.116	6.11

b. Average Analysis on Straight Cargoes:

	Mine		Lake Erie	
Grade	Iron	Phos.	Iron	Moisture
Lump Cliffs Shaft	58.20	.106	58.39	.33
Crushed Cliffs Shaft	57.86	.103	58.44	1.50
Bancroft Lump	(All Mixed)			
Bancroft Crushed	(All Mixed)			

4. ESTIMATE OF ORE RESERVES:

a. Developed Ore - Cliffs Shaft Grade:

	A Shaft Tons	B Shaft Tons	Total Tons
Pillars	1,116,000	704,000	1,820,000
Floors	1,980,000	886,000	2,866,000
Partly Developed	62,000	24,000	86,000
Total	3,158,000	1,614,000	4,772,000
To support surface	1,882,000	1,167,000	3,049,000
Available Ore	1,276,000	447,000	1,723,000
Less 10% Rock and 10% Loss in Mining	255,000	89,000	344,000
	1,021,000	358,000	1,379,000

Recapitulation

	Developed Tons	Prospective Tons	Total Tons
Available Ore	1,637,000	86,000	1,723,000
Less 10% Rock and 10% Loss in Mining	327,000	17,000	344,000
Net Available Ore	1,310,000	69,000	1,379,000

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4. ESTIMATE OF ORE RESERVES: (Continued)

a. Developed Ore - Bancroft Grade:

	A Shaft Tons
Pillars	57,000
Floors	54,000
Partly Developed	18,000
Total	129,000
To support surface	58,000
Available Ore	71,000
Less 10% Rock and 10% Loss in Mining	14,000
Net Total	57,000

Recapitulation

	Developed Tons	Prospective Tons	Total Tons
Available Ore	53,000	18,000	71,000
Less 10% Rock and 10% Loss in Mining	11,000	3,000	14,000
Net Available Ore	42,000	15,000	57,000
Total Ore Both Grades	1,352,000		

Assumption: 8, 9, and 10 cu. ft. equals one ton.
10% deduction for rock.
10% deduction for loss in mining.
Percentage of bessemer equals 0.

c. Estimated Analysis:

	Iron	Phos.	Sil.	Alum.	Mang.	Lime	Mag.	Sul.	Igni.	Moist.
Dried 212°	58.30	.100	6.71	2.45	.593	1.69	1.33	.010	2.66	
Natural	57.02	.098	6.56	2.40	.580	1.65	1.30	.010	2.60	2.20

The above analysis is for both Bancroft and Cliffs Shaft grades.

5. LABOR AND WAGES:

a. Comments:

(1) Labor:

There was no shortage of labor during the year, but at time an unusually large number of men were temporarily absent from work on account of sickness or were working on their farms, and their places were not filled.

There was no change in the wage scale during the year.

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5. LABOR AND WAGES: (Continued)

b. Comparative Statement of Wages and Product:

	1926	1925	INCREASE	DECREASE
*PRODUCT	331,373	318,601	12,772	
No. Shifts & Hours	1-8	1-8		
No. of Days	267	260	7	
AVG. NO. MEN WORKING:				
Surface	53	63		10
Underground	206	205	1	
Total	259	268		9
AVG. WAGES PER DAY:				
Surface	4.44	4.40	.04	
Underground	5.03	5.10		.07
Total	4.89	4.93		.04
**WAGES PER MO. OF 25 DAYS:				
Surface	111.00	110.00	1.00	
Underground	125.75	127.50		1.75
Total	122.25	123.25		1.00
PRODUCT PER MAN PER DAY:				
Surface	19.37	18.32	1.05	
Underground	5.91	5.91	.00	
Total	4.53	4.47	.06	
LABOR COST PER TON:				
Surface	.229	.240		.011
Underground	.847	,864		.017
Total	1.076	1.104		.028
AVG. PRODUCT BRK'G & TRM'G	9.54	8.90	.64	
AVG. WAGES CONTRACT MINERS	5.49	5.50		.01
AVG. WAGES CONTRACT LABOR	5.34	5.49		.15
TOTAL NO. OF DAYS:				
Surface	17,107½	17,391¼		283¾
Underground	56,039½	53,935¾	2,103¾	
Total	73,147	71,327	1,820	
AMOUNT FOR LABOR:				
Surface	76,027.79	76,599.71		571.92
Underground	281,814.63	275,122.63	6,692.00	
Total	357,842.42	351,722.34	6,120.08	

Note:- *Figures are base on production without stockpile overrun.

**The mine is working 22 days per month.

Proportion surface to Underground Men:

1926 - 1 to 3.89
1925 - 1 to 3.41
1924 - 1 to 3.19
1923 - 1 to 3.37
1922 - 1 to 3.39
1921 - 1 to 2.44

1924 - Mine worked 1-8 hr. shift 5 days per week from July 30.
1925 - Mine worked 1-8 hr. shift 5 days per week.
1926 - 1-8 hr. shift 5 days per week from January 1, to October 1.
1-8 hr. shift 6 days per week from October 1st to December 1.
1-8 hr. shift 5 days per week from December 1st to December 31.

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6. SURFACE:

a. Building, Repairs:

Mine Office:

The mine office was painted outside and calcimined and varnished inside in October, and was very much improved in appearance.

Shops:

At 1:30 A. M. on December 9th, fire broke out in the room over the boiler in the south wing of the shop-building, and was not extinguished until 7 hours later. The floor and roof of this wing of the building were nearly destroyed and the roof of the machine-shop was damaged. There was no insurance. Repairs were started immediately afterwards, and were practically completed at the end of the year. Total damage was a little over $800.00.

Hoist Motor:

The motor for B shaft hoist was rewound on March 13, 14 and 15, and no ore was hoisted on the 15th, the mine working the following Saturday instead.

Dry:

A new stack was put up at the dry in July.

Sheave-Stands:

The counter-weight turn-sheave stands at both shafts were re-built during the summer. The stand at B shaft broke on June 4th, resulting in half a day delay at this shaft.

Crushers:

The west No. 5 crusher was taken down and shipped to the Holmes Mine to replace the No. 6 crusher sent from there to the Morris-Lloyd Mine. The east No. 5 crusher is being moved to the west side of the foundation.

Top-Tram Hoist:

The spur gear and pinion on the top-tram hoist were replaced by a herringbone gear and pinion in August. The old gear was cracked, and the maintenance on the pinions was very high.

b. Stockpiles:

Both stockpiles were entirely cleaned up for the first time in many years. Owing to the changes in the loading tracks made last year, erection of the new trestles could be started before all the ore in stock had been shipped, and as a consequence trestles for both grades were ready to handle ore before shipments to the dock were stopped.

The second trestle for lump ore has not been completed yet.

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7. UNDERGROUND:

b. Development:

Development at the Cliffs Shaft Mine is divided into two classes:-

1. Opening new ore.
2. Preparing known ore for mining.

New ore is opened by drifts, raises and breast-stopes. In this work breast-stopes and large raises are used mostly, because of greater economy in breaking ore. Drifts and raises are used for preparing known ore for mining.

As a breast-stope proves up approximately as much additional ore as is mined in it, the ore reserves can be maintained without much decrease, if half of the working places in ore are developing new ground.

The average classification of contracts is given in the following table:-

	A Shaft	B Shaft	Total
Stopes	16	4	20
Floors	9	12	21
Backs	1	0	1
Drifts and Raises	6	5	11
Rock	3	3	6
Total	35	24	59
Developing New Ore	20	6	26
Mining Known Reserves	12	15	27
Rock	3	3	6
Total	35	24	59

A Shaft - Bancroft Ore:

This is ore on the lease from the O. I. M. Co. on Section 3.

First Level:

One contract with two machines has been working in the ore 600 feet north of A shaft. Two raises have been put up on the foot wall 60 feet above the level 600 feet north of the shaft, and D. D. H. No. 1007 was followed to the north-east for 100 feet partly in ore and partly in rock. This ore apparently pitches to the south-east across the line, where ore has been mined on Cliffs Shaft ground on the second and third levels.

Sixth Level:

From 1180 to 1500 feet north-east of the shaft ore has been mined by three contracts breast-stoping for a length of 260 feet and a width of 80 feet. This new level is 10 feet lower than the adjacent workings on the C. C. I. Co. side of the line. The slate is coming down in the back, and the foot-wall is rising in the bottom in the east end, but the ore will probably extend further to the west. There is also ore exposed on the boundary 300 feet further east.

Seventh Level:

Two contracts have been working here. One has put up two raises to the north and east, on the foot-wall from a sub-level 950 feet north-east of the shaft. Apparently the end of the ore was reached in the north raise, but the east raise is going ahead. The other contract has driven a stope towards the north-west for 200 feet, and the breast is now 830 feet northeast of the shaft.

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7. UNDERGROUND:

b. Development:

Seventh Level: (Continued)

They had jasper on both sides for 150 feet, but for the last 50 feet there has been ore on all sides.

Merchantable ore has been found in diamond-drill holes on the first, second and third levels, but nothing is known of its lateral extent.

Fourth Level - North Vein:

One gang opened a stope in good ore 350 feet north of the shaft, and are stoping west.

Fifth Level - South-East Deposit:

One contract continued their stope east close to the south boundary, 1350 feet south-east of the shaft to the end of the ore, and then raised to the 995 sub-level 35 feet above the level.

500 feet further east another miner in the same contract drifted east along the hanging-wall, partly in rock and partly in ore, and opened a stope in good ore in November. This is the same ore as that being mined on the sixth, seventh and eighth levels.

Sixth Level - South-East Deposit:

A stope has been driven east for 120 feet in good ore 100 feet north of the boundary and 1800 feet south-east of the shaft, and a raise is being put up from this stope to the fifth level.

North Vein:

A stope has been driven west for 120 feet along the north boundary to the end of the ore, 1700 feet north-east of the shaft, and two cross-cuts are now being started to the south. There is good ore on the north boundary line.

2,000 feet north-east of the shaft a raise was put up to the elevation of the fifth level, but very little ore was found.

Thirty feet above the level a sub-level was opened last year 1840 feet north-east of the shaft, and this was continued east for 160 feet till it holed to two raises from the sixth level. One gang is now stoping west on this ore.

Another gang is raising on the foot-wall at approximately the elevation of the fifth level 2,080 feet north-east of the shaft. This contract has been raising here all year. There is a bad rock-seam in the ore, but this is a very important piece of development, because the ore is the probable downward extension from No. 3 mine.

Seventh Level - North Vein:

One contract with two machines has been drifting, stoping and raising 2,050 to 2,180 feet east of the shaft. One raise was put up as high as the sixth level and still has ore, but the other work was disappointing.

Main Vein:

One gang is stoping on the foot-wall, following the ore upwards 2,200 feet east of the shaft.

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7. UNDERGROUND:

b. Development: (Continued)

South-East Deposit:

A stope has been driven east and west along the foot-wall for 120 feet, 1,800 feet south-east of the shaft. A raise has also been put up in this ore to the sixth level.

Eighth Level - South-East Deposit:

1,800 feet south-east of the shaft a stope is being driven east in ore 16 feet wide. This stope was opened from a raise put up from the ninth level to the seventh level.

1,200 feet south-east of the shaft a raise was put up to the seventh level early in the year.

Ninth Level - South-East Deposit:

1,780 feet south-east of the shaft a raise was put up to the seventh level.

In December a raise was started from the old stope 2,060 feet south-east of the shaft, and is going up in high grade steel ore. This is the probable downward extension of the Incline Mine vein.

Tenth Level - North Vein:

Two raises were put up in rock from cross-cuts in the foot-wall 1,370 and 1,440 feet east of the shaft.

Main Vein:

A drift has been started to the north 1,900 feet east of the shaft to open the ore found in drill-hole No. 4 from surface.

South-East Deposit:

A raise has been put up to the ninth level 1,290 feet south-east of the shaft.

Eleventh Level - Main Vein:

A drift was driven 70 feet through jasper to the ore, following D. D. H. No. 332, and two stopes are now being driven north and west 1,600 feet east of the shaft.

Twelfth Level - Main Vein:

In the north-east corner of the deposit 1,500 feet east of the shaft the ore was followed in two stopes to its limit, and a raise has been put up to the eleventh level.

B Shaft

First Level - Main Vein:

A raise was put up in rock from the main cross-cut, 650 feet south-east of the shaft, to the east end of the 1,200 foot sub-level, and the ore here has been mined down to the 1,180 foot sub.

Another raise has also been put up through the pillar 300 feet south-west of the shaft to the 1,190 foot sub-level. This raise had some rock.

South Lens:

A raise was put up from the main level, 820 feet south-east from the shaft, to the 1,190 foot sub-level, and the ore around the top of the raise has been mined down for a depth of 15 feet.

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7. UNDERGROUND:

b. Development: (Continued)

Fifth Level - North Vein:

A raise is being put up in rock 320 feet north of the shaft, and is now up to the third level.

Sixth Level - North Vein:

The stope 420 feet north-east of the shaft was continued a short distance to the south-east, and two raises were put up to the fifth level in A shaft.

Seventh Level - North Vein:

A rock drift is being driven to the south-east, 390 feet north-east of B shaft, to mine the floors of the fifth and sixth levels.

500 feet north-east of the shaft a narrow stope is being driven to the east. This contract has been in ore for 80 feet. Raises are to be put up from this stope to mine the floor of a sub-level above.

A raise has been put up to the sixth level 400 feet north of the shaft.

Eighth Level - North Vein:

In December a rock-drift was started to the north-west 500 feet north-west of the shaft. This drift is to be used for mining the floors of the seventh level.

Main Vein:

On gang has raised to the seventh level 1,470 feet south west of the shaft.

Ninth Level - Main Vein:

A raise was put up to the eighth level 1,500 feet south-west of the shaft.

Fault Vein:

A raise was put up in jasper to the eighth level Main Vein 1,100 feet west of the shaft early in the year.

Tenth Level - Fault Vein:

A rock drift was driven west in the foot-wall for 150 feet, starting at the end of the drift 1,260 feet south-west of the shaft. A raise is to be put up from this drift to mine the floor of the eighth level.

Eleventh Level - Fault Vein:

Two gangs are raising to the tenth level 1,220 and 1,440 feet west of the shaft.

Twelfth Level - Main Vein:

During the last four months of the year one contract has drifted north-west and north, 1,600 feet west of the shaft, in ore and rock for 100 feet exploring the ore found in D. D. H. No. 363 and trying to find the upward extension of the new ore found on the thirteenth level. Nothing of value has been found by this drift. A drift to be used as a man-way was also driven for 100 feet along the hanging wall from the Main Vein 1,420 feet west of the shaft to the Fault Vein.

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7. UNDERGROUND:

b. Development: (Continued)

Twelfth Level - Fault Vein:

Three raises have been put up to the eleventh level 1,385, 1,445, and 1,515 feet west of the shaft.

Thirteenth Level - Main Vein:

Two gangs have been stoping west or raising all the year from 1,550 to 1,675 feet west of the shaft. In the northern stope the ore was cut off by jasper in the breast, but it has been followed in two raises west and south almost to the twelfth level. Two gangs are working here. In the south stope there is ore on all sides and in the breast. This is ore cut by D. D. H. No. 364.

Fourteenth Level - Main Vein:

Three branch raises were put up to the thirteenth level 1,220, 1,260, and 1,270 feet west of the shaft.

Fourteenth Level - Fault Vein:

A stope was driven west along the jasper on the north side of the vein for 70 feet, 1,500 feet west of the shaft early in the year. Four raises, 1,510, 1,550, 1,580 and 1,620 feet west of the shaft, were put up to the thirteenth level. Development in this vein is now nearly complete.

Fifteenth Level - Main Vein:

A long, flat, raising stope has been put up to the east from the end of the stope 1,900 feet north-west of the shaft, and is now up as high as the fourteenth level, where it is 180 feet out in the hanging. This ore lies in a trough, and pinches out to five feet thickness or less on the sides.

A cross-cut 150 feet long was driven north into the hanging wall, cutting one vein of ore 5 feet thick, and a drill-station was cut out at the end of it, 1,980 feet north-west of the shaft. Here four holes were put down without finding merchantable ore.

Another drift was driven 80 feet north-west into the hanging-wall, and a station was cut for drillin 2,090 feet north-west of the shaft. This was finished in December.

Fifteenth Level - Fault Vein:

Early in the year two branch raises were finished to the fourteenth level 1,500 and 1,650 feet west of the shaft.

c. Stoping:

As much of the development of new ore has been done by breast-stoping, much of the stoping has already been described under the heading of Development.

Most of the stoping not so described consists of mining floors, taking backs and general cleaning up in old workings.

A Shaft

First Level - Main Vein:

One gang has worked all year between the first and second levels mining ore left behind years ago. In this place ore has been found under the jasper that had been considered the foot-wall.

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7. UNDERGROUND:

c. Stoping: (Continued)

Third Level - Main Vein:

One gang drifted through a pillar from A shaft workings 280 feet south-west of the shaft, and holed to the floor of the third level in B shaft. They have mined this floor for 100 feet in length.

Fourth Level - North Vein:

One gang mined the floor of the third level 350 feet north of the shaft during the first half year.

Fourth Level - Main Vein:

During most of the year one gang was mining in the back and raising 250 feet south-west of A shaft. This place was about finished at the end of the year.

Fourth Level - South-East Deposit:

One gang has been mining in the floor most of the year and is now stoping east along the hanging-wall 1,570 feet south-east of the shaft.

Fifth Level - South-East Deposit:

One gang mined the floor of the fourth level to a depth of 15 feet, 1,480 feet south-east of the shaft and stoped through the pillar to the east.

Sixth Level - South Lens:

One gang mined the floor of the fifth level and of a sub-level between the fifth and sixth levels 600 feet south-east of the shaft, and finished in December.

Seventh Level - North Vein:

One gang has been mining the floor of the sixth level 900 to 1,000 feet north-east of the shaft all the year, but have nearly finished the available ore in this place.

Another gang has mined the floor of a sub-level 1,370 feet east of the shaft and finished in November.

Eighth Level - North Vein:

Two gangs are mining floors 1,400 and 1,550 feet north-east of the shaft. They have been working here most of the year.

In November and December one gang was mining the floor of the seventh level 1,400 feet east of the shaft.

Ninth Level - South Lens:

One gang has been mining the floor of the eighth level and stoping on a sub-level 950 feet south-east of the shaft.

Tenth Level - Main Vein:

One gang mined the floor of the ninth level 1,120 feet east of the shaft for most of the year.

Tenth Level - South Lens:

One gang has been mining the floor of the ninth level 1,050 feet south-east of the shaft all year.

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7. UNDERGROUND:

c. Stoping: (Continued)

Tenth Level - South-East Deposit:

One gang has been mining the floor of the ninth level all year from 720 to 920 feet south-east of the shaft. They have had a good deal of rock.

Eleventh Level: Main Vein:

A raising stope has been put up to the hanging wall a short distance above the tenth level 1,130 feet east of the shaft.

B Shaft

First Level - Main Vein:

The floor of the 1,204 and 1,190 foot sub-levels has been mined by three contracts nearly all year, 400 to 440 feet south-west of the shaft, 300 to 400 feet south of the shaft, and 440 to 550 feet south-east of the shaft. Two gangs are continuing this work, and a third is mining the foot of an old raise 360 feet south-west of the shaft.

Third Level - North Vein:

300 feet north of the shaft the floor of the second level has been mined down to the third level around a raise put up from the fifth level in A shaft.

Fourth Level - Main Vein:

The available ore in the floor of the third level 200 feet east of B shaft was mined during the first half-year.

Sixth Level - North Vein:

One gang has been stoping all year on a sub-level 620 to 720 feet northwest of the shaft, mining the floor of the fifth level to a depth of 10 feet. They are nearly finished.

Seventh Level - Main Vein:

The floor of the sixth level was mined in two places 420 feet north-west of the shaft.

Seventh Level - North Vein:

The floor of a sub-level 440 feet north of the shaft was mined down 10 feet, and is nearly finished. There remains about a year's work on the eastern end of this sub-level, but this ore is not yet ready to mine.

Eighth Level - Fault Vein:

One contract has been mining the floor of the seventh level 900 to 1,000 feet south-west of the shaft throughout the year.

Eighth Level - Main Vein:

Early in the year a raise was put up from the ninth level in the Fault Vein to the eighth level in the Main Vein, 1,100 feet south-west of the shaft, and during the rest of the year one contract has been milling the floor of the seventh level 1,100 feet south-west of the shaft into this raise.

Ninth Level - Main Vein:

One gang worked most of the year mining the floor of the eighth level at the end of the vein, 1,520 to 1,620 feet south-west of the shaft.

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7. UNDERGROUND:

c. Stoping: (Continued)

Eleventh Level - Main Vein:

The floor of the north stope on the tenth level, 840 feet north-west of the shaft, was finished early in the year, and the floor close to the hanging wall 930 feet west of the shaft was mined later.

One gang worked most of the year mining the floor of the tenth level from 1,240 to 1,330 feet west of the shaft.

Twelfth Level - Main Vein:

The floor of the eleventh level 1,060 feet north-west of the shaft has been mined for a length of 110 feet, and was finished early in the fall.

Twelfth Level - Fault Vein:

One gang during the first part of the year mined the floor of the eleventh level 1,320 feet west of the shaft.

Fourteenth Level:

The floor of the thirteenth level has been mined to a depth of 15 to 20 feet for a length of 100 feet 1,400 feet north-west of the shaft, and, 150 feet nearer the shaft, to a depth of 40 feet with a maximum length of 80 feet. This ore has been milled directly into the raise.

e. Drifting and Raising:

The drifting and raising done in 1926 has been described under Development.

YEAR	ROCK DRIFTING	ORE DRIFTING	ROCK RAISING	ORE RAISING
1925	2,331 ft.	570 ft.	974 ft.	786 ft.
1926	1,561 ft.	628 ft.	1,490 ft.	2,279 ft.

f. Explosives, Drilling and Blasting:

In 1925 - 18 new drills were purchased, and in 1926 - 27. Most of these have been Cleveland D5 Drifters.

Statement of Explosives Used:

Kind	Quantity	Average Price	Amount 1926	Amount 1925
50% Powder	209,600	.1410	29,558.25	31,907.25
60% "	46,150	.1506	6,950.75	3,115.50
60% Gelatin				184.26
Total Powder	255,750	.1427	36,509.00	35,207.01
Fuse	363,655	6.375	2,318.21	2,027.06
Caps	76,381	10.63	813.43	733.69
Crimpers	27	.666	17.99	27.34
Total Fuse, etc.			3,149.63	2,788.09
TOTAL EXPLOSIVES			39,658.63	37,995.10
Product			340,253	318,601
Pounds powder per ton of ore			.7516	.7572
Cost per ton for powder			.1073	.1105
" " " " fuse, etc.			.0092	.0088
" " " " all Explosives			.1166	.1193
Average price per pound for powder			.1427	.1459

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8. COST OF OPERATING:

a. Comparative Mining Costs:

	1926	1925	Increase	Decrease
PRODUCT	340,253	374,356		34,103
Underground Costs	1.390	1.231	.159	
Surface Costs	.188	.172	.016	
General Mine Accounts	.104	.070	.034	
Cost of Production	1.682	1.473	.209	
Plant Account	.021	.021		
Equipment		.001		.001
Taxes	.304	.270	.034	
Central Office	.099	.086	.013	
Contingent Expense	.046	.067		.021
Cost Adjustment	.053	.040	.013	
Cost on Stockpile	2.205	1.958	.247	
Loading and Shipping	.040	.047		.007
Total Cost on Cars	2.245	2.005	.240	
No. Days Operating	267	261	6	
No. Shifts and Hours	1 - 8	1 - 8		
Average Daily Product	1,274	1,434		160
COST OF PRODUCTION:				
Labor	1.063	.947	.116	
Supplies	.619	.526	.093	
Total	1.682	1.473	.209	

The increase in cost is due to the large stockpile overrun, which was taken up into production in 1925. This overrun was the accumulation of several years, but in 1926 the overrun was only that accumulated in the current season. General Mine Accounts would have been higher in 1926 without the overrun, on account of two fatal accidents. Shipping expense was lower on account of smaller stockpile shipments. Taxes will be discussed later. Central Office was higher, and the increase in Cost Adjustment was offset by the decrease in Contingent Expense.

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8. COST OF OPERATING: (Continued)

b. Detailed Cost Comparison:

(1) Days and Shifts:

The mine worked on single shift throughout 1926, five days a week except in October and November, when it worked six days a week. The total number of days was 267, seven more than in 1925. Hoisting was done over-time in both years as needed. There was no change in the wage-scale in either year.

UNDERGROUND COSTS:

Exploring in Mine:

1925	$ 8250.96	$ .022
1926	8364.39	.024
Increase	$ 113.43	$ .002

There were seven more working days in 1926 and runner's wages were higher part of the time. In 1925 2420 feet were drilled and in 1926 2297 feet. Direct charges decreased $ 162 and supplies $ 498, a total of $ 660. Local labor increased $ 773, on account of moving and higher rate for drill-runner.

Development in Rock:

1925	$ 43102.64	$ .115
1926	34947.45	.103
Decrease	$ 8155.19	$ .012

In 1925 3305 feet cost $ 13.04 per foot. In 1926 3051 feet cost $ 11.45 per foot.

Development in Ore:

1925	$ 15832.54	$ .042
1926	28327.98	.083
Increase	$ 12495.44	$ .041

In 1926 ore-drifting increased 58 feet and ore-raising increased 1493 feet.

Stoping:

1925	$ 125058.47	$ .334
1926	133519.15	.392
Increase	$ 8460.68	$ .058

Explosives decreased $ 2060. Drill-steel increased $ 1046. Labor increased by more contracts and more days worked, and by change in distribution of miners' time between stoping and tramming.

Timbering:

1925	$ 8285.49	$ .022
1926	12735.88	.037
Increase	$ 4450.39	$ .015

In 1926 the chutes on the eighth and tenth levels in "A" shaft had to be changed and many were rebuilt to fit the new cars. Both labor and supplies increased. Total supplies increased $ 1553. Timber increased $ 868 and iron and steel increased $ 514.

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8. COST OF OPERATING: (Continued)

UNDERGROUND COSTS: (Continued)

Tramming:			The decrease is due partly to greater use of scrapers and locomotives and partly to change in distribution of miners' time to stoping and tramming.
1925	$ 128103.56	$ .342	
1926	119596.83	.352	
Decrease	$ 8506.73		
Increase		$ .010	
Ventilation:			
1925	$ 1.63	$ .000	
1926	3.61	.000	
Increase	$ 1.98	$ .000	
Pumping:			Power charges, due to heavier rainfall, increased $ 4066.17.
1925	$ 22760.21	$ .061	
1926	25633.55	.075	
Increase	$ 2873.34	$ .014	
Compressors and Air Pipes:			Power charges increased $ 612 in 1926, and total supplies $ 871.
1925	$ 34652.48	$ .093	
1926	35585.15	.105	
Increase	$ 932.67	$ .012	
Back Filling:			In 1925 the mine produced 20,892 tons of rock and in 1926 20,902 tons. In 1925, however, a large proportion of this rock did not have to be hoisted.
1925	$ 9148.91	$ .024	
1926	11163.08	.033	
Increase	$ 2014.17	$ .009	
Underground Superintendence:			The mine worked seven more days in 1926 and there was more hoisting done overtime. The captain's wages increased $ 220.
1925	$ 14705.44	$ .039	
1926	15418.80	.045	
Increase	$ 713.36	$ .006	
Cave-In:			
1925	$ 31.26	$ .000	
1926			
Decrease	$ 31.26	$ .000	

MAINTENANCE ACCOUNTS:

Compressors and Power Drills:			In 1925 18 drills cost $ 6778, and in 1926 12 drills cost $ 3525, a decrease of $ 3253. Compressor parts also decreased $ 200.
1925	$ 7403.94	$ .020	
1926	3861.75	.011	
Decrease	$ 3542.19	$ .009	
Hand Tramming Equipment:			Supplies increased $ 2700, of which $ 1655 was for scraper-hoists. New scrapers, electric cable and fixtures, tail-blocks, etc. cover the other $ 1000. Labor decreased.
1925	$ 29292.96	$ .078	
1926	29793.23	.088	
Increase	$ 500.27	$ .010	

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8. COST OF OPERATING: (Continued)

UNDERGROUND COSTS: (Continued)

Electric Tram Equipment:			
1925	$ 13007.35	$ .035	In 1925 charges for armatures and repairs were $ 1150 higher and $ 249 higher for rectifiers. The balance is in labor charges.
1926	11115.37	.033	
Decrease	$ 1891.98	$ .002	
Pumping Machinery:			
1925	$ 1302.76	$ .004	In 1926 new gears cost $ 1031 and gate valves $ 102. Labor making these repairs also increased.
1926	3004.22	.009	
Increase	$ 1701.46	$ .005	

SURFACE COSTS:

Hoisting:			
1925	$ 16335.88	$ .044	In 1926 power charges increased $ 349.35 and heating expense $ 43. Labor increased on account of seven more work-days and more hoisting over-time.
1926	16962.46	.050	
Increase	$ 626.58	$ .006	
Stocking Ore:			
1925	$ 10305.98	$ .028	In 1925 a small hoist cost $ 464, and timber was $ 280 higher than in 1926. Carpenter labor on trestles decreased $ 474 in 1926.
1926	9236.81	.027	
Decrease	$ 1069.17	$ .001	
Screening-Crushing at Mine:			
1925	$ 10469.01	$ .028	The decrease is in charges for plates and labor on chutes.
1926	10227.76	.030	
Decrease	$ 241.25		
Increase		$ .002	
Dry House:			
1925	$ 6175.13	$ .016	Labor decreased $ 276. There was one less man in the fall of 1926.
1926	5905.68	.017	
Decrease	$ 269.45		
Increase		$ .001	
General Surface Expense:			
1925	$ 7343.59	$ .020	The decrease is in general surface labor.
1926	7088.71	.021	
Decrease	$ 254.88		
Increase		$ .001	

MAINTENANCE ACCOUNTS:

Hoisting Equipment:		
1925	$ 6042.49	$ .016
1926	5995.39	.018
Decrease	$ 47.10	
Increase		$ .002

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8. COST OF OPERATING: (Continued)

SURFACE COSTS: (Continued)

Shaft:			
1925	$	763.64	$ .002
1926		1205.77	.004
Increase	$	442.13	$ .002

In 1926 the shaft-pockets on the eighth and tenth levels in "A" shaft were rebuilt.

Top Tram Equipment:			
1925	$	3671.33	$ .010
1926		3186.69	.009
Decrease	$	484.64	$ .001

In 1926 a new gear and pinion cost $ 425, and in 1925 changing the motor cost $ 473. Rope charges decreased $ 164, and a new tram car in 1925 cost $ 219.

Docks, Trestles and Pockets:			
1925	$	909.08	$ .002
1926		388.46	.001
Decrease	$	520.62	$ .001

In 1926 all charges were for repairs to pockets. In 1925 erection of new and permanent trestles cost $ 386.22 and repairs to pockets cost $ 522.86.

Mine Buildings:			
1925	$	2249.53	$ .006
1926		3807.84	.011
Increase	$	1558.31	$ .005

In 1925 the coal-dock was repaired at a cost of $ 1469. In 1926 repairs to the shops following fire cost $ 794, and repairs and decoration at office cost $ 210. Charges for E and A. No. 495, new heating plants, account for the balance.

GENERAL MINE ACCOUNTS:

Insurance:			
1925	$	158.40	$ .000
1926		160.80	.001
Increase	$	2.40	$ .001

Engineering:			
1925	$	3412.62	$ .009
1926		2829.59	.008
Decrease	$	583.03	$ .001

This is a Central Office charge.

Analysis:			
1925	$	3247.35	$ .009
1926		2360.92	.007
Decrease	$	886.43	$ .002

Central laboratory charges decreased $ 415.79. Labor sampling also decreased on account of smaller stockpile shipments.

Personal Injury Expense:			
1925	$	4993.95	$ .013
1926		13855.62	.041
Increase	$	8861.67	$ .028

There were two fatal accidents in 1926---Isaac Setala and Alfred Gustafson---and none in 1925.

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8. COST OF OPERATING: (Continued)

GENERAL MINE ACCOUNTS. (Continued)

Safety Department Expense:			
1925	$	52.46	$ .000
1926		112.98	.000
Increase	$	60.52	$ .000
Telephones and Safety Devices:			
1925	$	2108.16	$ .006
1926		2459.20	.007
Increase	$	351.04	$ .001
Local General Welfare:			
1925	$	971.44	$ .002
1926		914.00	.003
Decrease	$	57.44	
Increase			$ .001
Special Expense:			
1925	$	9.50	$ .000
1926			
Decrease	$	9.50	$ .000
Mine Office:			
1925	$	11475.28	$ .031
1926		12726.80	.037
Increase	$	1251.52	$ .006

The increase is in timbermens' time on underground safety improvements.

Direct charges increased $ 721 in 1926 and local charges increased $ 247, which is the difference in superintendent's choreman's wages, there being no choreman for the first five months of 1925. Balance of $ 284 is in charges made at Cleveland.

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9. EXPLORATIONS AND FUTURE EXPLORATIONS:

Underground Diamond Drilling:

Thirteen holes were drilled underground during the year, of which eight were in B shaft and 5 in A shaft. A detailed description of this drilling will be given in the geologist's report. A general resume follows:-

Hole No. 362 was drilled horizontally to the south on the twelfth level in B shaft 1,600 feet west of the shaft, and cut one vein of ore 5 feet thick. It was stopped in rock at a depth of 190 feet.

Hole No. 363 was drilled to the north at the same place as No. 362, and cut 15 feet of ore. It was stopped in quartz at 78 feet.

Hole No. 364 was drilled to the south on the thirteenth level 1,650 feet west of B shaft, and passed through 54 feet of ore. It was stopped in diorite in the foot-wall at a depth of 314 feet.

Hole No. 365 was drilled to the south on the fourteenth level 1,730 feet west of B shaft, and was continued to a depth of 381 feet. 29 feet of ore was cut, but it was not of very good quality.

Hole No. 366 was drilled vertically downward at the west end of the 15th level in B shaft, and cut 5 feet of ore. It was stopped in the foot-wall at 142 feet.

Hole No. 367 was drilled west from the same station as No. 366, and was stopped at 86 feet in the hanging-wall.

Hole No. 368 was drilled east from the same station for 120 feet into the foot-wall.

Hole No. 369 was drilled north from the same station for 159 feet into the hanging-wall.

The drilling on this level was very disappointing. Another drill-station has been prepared further south on this level to test the downward extension of the Main Vein.

The drill was then moved to A shaft to explore the south part of the O. I. M. Co. lease on Section 3.

Hole No. 370 was drilled north on the first level 520 feet north-west of A shaft. It cut three veins of ore aggregating 54 feet in width with only thin bands of jasper separating them. It was stopped in the foot-wall at 207 feet.

Hole No. 371 was drilled to the north on the second level 510 feet north of A shaft. It cut 8 feet of ore at the start, and passed into the foot-wall, in which it was stopped at 139 feet.

Hole No. 372 was drilled to the north from a point on the second level 240 feet east of No. 371 and 535 feet north-east of A shaft. It found 20 feet of ore, and was stopped in the foot-wall at 134 feet.

Hole No. 373 was then drilled to the north-east on the same level from a point 25 feet east of No. 372, and had four runs of ore, 45 feet, 29 feet, 16 feet and 9 feet thick, and was stopped in the foot-wall at a depth of 200 feet.

Hole No. 374 was drilled north on the third level from a point 630 feet north-east of A shaft, and was in 161 feet at the end of the year. It cut three runs of ore, the first 23 feet wide, the second 40 feet wide, and the third 8 feet wide. It was in ore again at the end of the year. This last ore is apparently the same vein as is being followed by a stope on the seventh level. It is all Bancroft ore.

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10. TAXES:

There was a slight increase in taxes in 1926. The valuation of the realty was increased by the tax commission from $ 2,449,810 to $ 2,477,800. In 1925 the taxes on the SE¼ of NE¼ of Sec. 9, leased to the O. I. M. Co., were paid by the C. C. I. Co. and then billed to the O. I. M. Co. In 1926 they were paid by the O. I. M. Co. directly.

Comparative Statement of Taxes for Years 1926 and 1925

	1926		1925	
	Valuation	Taxes	Valuation	Taxes
Realty placed by Tax Comm.	2,477,800	81,091.02	2,633,000	83,019.38
Less Oliver SE¼-NE¼ Sec. 9.			183.190	5,776.06
Net Realty			2,449,810	77,243.32
Personal	567,000	18,553.22	637,000	20,084.89
Lot 2, Sec. 3-47-27-60A Minrls	89,000	2,912.70	89,000	2,806.20
Lot 174 - Nelson Addition	100	3.27	100	3.15
So. 35.91 ft. of Lot 179	50	1.64	50	1.58
Total	3,133,950	102,561.85	3,175,960	100,139.14
Collection Fees		1,025.62		1,001.39
Total		103,587.47		101,140.53

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11. ACCIDENTS AND PERSONAL INJURY:

a. Fatal Accidents:

1. Alfred Gustafson:

On March 17th at 10:00 A. M. Alfred Gustafson, a miner working in No. 43 contract at the west end of the 15th level in B shaft, received a compound fracture of the right leg, while barring loose ground in a drift. While he was barring one piece of ground, another piece fell, knocking the bar out of his hands. The bar struck his leg.

Gustafson was 66 years old, and suffered somewhat from shock, but was apparently making a good recovery. He contracted influenza while at the hospital, and died on May 6. The accident was the cause of his death only in so far as it might have weakened his resistance against disease.

He was survived by a widow and three grown children. He had been a miner at the Cliffs Shaft Mine for 28 years.

2. Isaac Setala:

At 9:45 A. M. on Friday, May 21, Isaac Setala, a miner working in No. 45 contract in the South-East Deposit on the eighth level in A shaft, was instantly killed by a fall of ground. He had started a raise, and had been trimming the back of the stope, where the raise started, just before the accident.

Setala was a Finn, 44 years old, and left a widow and one step-child. He was an old employe of the company.

The mine was closed on the afternoon of the 24th for the funeral.

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12. NEW CONSTRUCTION AND PROPOSED NEW CONSTRUCTION:

E. &. A. #488 - New Warehouse:

A Truscon Steel Warehouse, one-third as large as that at the General Storehouse, was erected early in the year 100 feet east of the shops. One quarter of it is partitioned off for a garage for company trucks and cars, and the rest is used for storage of machinery and machinery supplies.

The final statement for this E. &. A. is as follows:-

Acct. No.		ESTIMATE	TOTAL TO DATE	UNEXPENDED BALANCE
1	Truscon Steel Building	5,400.00	5,094.94	305.06
2	Foundation and Floors	800.00	1,190.07	390.07
3	Lighting and Heating	300.00	84.80	215.20
	Total	6,500.00	6,369.81	130.19
	10% for Contingencies	650.00		650.00
	GRAND TOTAL	7,150.00	6,369.81	780.19

E. &. A. #495 - Changes in Heating Plants:

In order to reduce the expense of heating the mine-buildings and the the Central Offices, an oil-heater was set up in a small cellar under the mine office, a larger oil-heater was installed in the basement of the Engineering office, and a small locomotive boiler was set up in the basement of the blacksmith shop. Certain changes were also made in piping. The new arrangement of plants is as follows:-

Boiler in dry, heating dry, engine-house, surface-dry and B shaft house.

Boiler in shops, heating shops, crusher-building and garage.

Boiler in laboratory, heating laboratory, A shaft house and drill-shop.

Oil-heater in mine office.

Oil-heater in Central Office.

All these plants work satisfactorily with a material saving in fuel, except the oil-heater in the Central Office. These buildings are now being heated by the boiler in the dry, which is overloaded in consequence.

The statement for this E. &. A. for the end of the year follows:-

Acct. No.		ESTIMATE	TOTAL TO DATE	UNEXPENDED BALANCE
1	Central Office	3,825.00	340.67	3,484.33
2	Cliffs Shaft Mine Office	2,075.00	480.95	1,594.05
3	Shops, Shaft House & Garage	2,525.00	1,299.14	1,225.86
4	Miscellaneous	300.00	142.65	157.35
	Total	8,725.00	2,263.41	6,461.59
	10% for Contingencies	872.00		872.00
	GRAND TOTAL	9,597.00	2,263.41	7,333.59

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13. EQUIPMENT AND PROPOSED EQUIPMENT:

d. Tugger Hoists and Scrapers:

E. &. A. #483 - Underground Equipment:

This E. &. A. called for 18 rocker-dump cars of 5 tons capacity, 4 small storage-battery locomotives, 4 scraper slides, 4 scrapers and hoists, and 4 new top tram cars.

The larger cars were for the eighth and tenth levels in A shaft, and required rearrangement of tracks at the shaft and changes in chutes and pockets. These changes were made early in the year, but the cars were not delivered until April. Changes had to be made in their dumping arrangements, and they were not put into service until July. They have materially increased hoisting capacity.

The scrapers went into service early, but the slides have not been completed. Two of the four top-tram cars have been built, and are in service. They have increased the top-tram capacity to correspond to the increased hoisting capacity, i. e. approximately 100 tons per shift at each shaft.

Three storage-battery locomotives went into service in March, and the fourth was loaned to the Ogden Mine, and was not sent underground until December 1.

Following is the last statement for this E. &. A.:-

Acct. No.		ESTIMATE	TOTAL TO DATE	UNEXPENDED BALANCE
1	Four Storage Battery Locomotives & Four Scrapers and Slides	12,800.00	11,936.82	863.18
2	Four Top Tram Cars	3,000.00	1,951.07	1,048.93
3	Re-equipping 8th Level "A" Shaft	7,000.00	5,062.44	1,937.56
4	Re-equipping 10th Level "A" Shaft	9,050.00	6,036.17	3,013.83
	Total	31,850.00	24,986.50	6,863.50
	10% for Contingencies	3,185.00		3,185.00
	GRAND TOTAL	35,035.00	24,986.50	10,048.50

E. &. A. #499 - Drills and Scrapers:

In order to increase production more contracts had to be started and more drills put to work. As air-compressor capacity could not easily be increased, four air-hoists used for scrapers had to be replaced with electric hoists, and more scrapers were needed. This increase in electric scraper-hoists required a rearrangement of power-lines, extra cables, transformers, etc.

Fifteen drills with tripods, etc. and 10 scraper outfits have been purchased, and most of them have already been put in service. New cable, transformers, etc. have been received, and are being installed. The full benefit from this new construction will not be felt until next year.

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13. EQUIPMENT AND PROPOSED EQUIPMENT:

d. Tugger Hoists and Scrapers:

E. &. A. #499 - Drills and Scrapers: (Continued)

The following statement shows the status of this E. &. A. at the end of the year:-

Acct. No.		ESTIMATE	TOTAL TO DATE	UNEXPENDED BALANCE
1	15 Drill Outfits	10,500.00	8,532.71	1,967.29
2	10 Scraper Outfits	10,500.00	5,292.63	5,207.37
3	Electric Cable, etc.	2,500.00	2,403.22	96.78
	Total	23,500.00	16,228.56	7,271.44
	Contingencies	2,350.00		2,350.00
	GRAND TOTAL	25,850.00	16,228.56	9,621.44

e. Trucks:

E. &. A. #487 - Two 1½-Ton Graham Bros. Trucks:

These trucks were bought in April for the Holmes and Cliffs Shaft Mines, and one team was dispensed with at each mine. The Holmes Mine truck in addition to its mine work hauled the men and supplies daily for the Ogden Mine.

Statement of E. &. A. #487:-

Acct. No.		ESTIMATE	TOTAL TO DATE	UNEXPENDED BALANCE
1	One 1½ Ton Graham Bros. Truck Express Body 216 Enclosed Cab	1,535.00	1,535.00	0
2	One 1½ Tons Graham Bros. Truck Canopy Body Enclosed Cab	1,575.00	1,575.00	0
3	Tires, Tubes and Chains	240.00	194.00	46.00
	GRAND TOTAL	3,350.00	3,304.00	46.00

f. Tram Cars:

Ten all-steel tram-cars were built early in the year. These cars are ten inches lower than the wooden cars and are equipped with ball-bearings. It is not planned to build any more wooden cars.

g. E. &. A. #482 - Steam Generator Unit:

A Corliss engine and synchronous motor to be used as a generator were set up in the engine-house by the electric power department, but were not put in service, as the shortage of water power was relieved early in the year.

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18. NATIONALITY OF EMPLOYES:

Americans	10
English	48
Irish	11
French	18
Scandavians	73
Finnish	106
Italians	12
German	3
Manx	2
Greek	1
Scotch	1
Total	285

99% are American citizens. In this report the classification is based on the father's nationality at birth. A large percentage of those classified as of foreign nationality are American born, and some are of mixed parentage.

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1. GENERAL:

The general situation at the mine has not changed materially during the past year. No new ore has been developed, but the tonnage extracted from some known areas has been larger than was expected. Shipments from stockpile have been large, and consequently stocking capacity is much greater than it was a year ago.

The mine continued to work on a single-shift, five-days-a-week basis throughout the year, and production was almost exactly the same as in 1925. There was no shortage of labor and no change in the wage-rate.

2. PRODUCTION, SHIPMENTS & INVENTORIES:

a. Production by Grades:

Grade	Product Tons	Overrun Tons	Total Tons
Holmes Bessemer	11,264	13,000	24,264
Holmes Lump	16,249		16,249
Holmes Crushed	34,286	2,000	36,286
Junction Bessemer	40,396	4,130	44,526
Junction	70,033		70,033
Total Ore	172,228	19,130	191,358
Rock			6,416

The product for the year 1926 was 1,523 tons more than in 1925. In 1925 the hard ore was screened for only three months, but in 1926 screening started at the end of April, and was continued to the end of the year, a period of eight months. During this time all hard ore went into the Holmes grades, and no Holmes Bessemer was produced.

The mine worked 260 days in 1926, and produced an average of 660 tons per day, not including stockpile overrun. In 1925 the mine worked 260 days, and the daily production was 656 tons.

b. Shipments:

Grade	Pocket Tons	Stockpile Tons	Total Tons	Total Last Yr.
Holmes Bessemer		20,580	20,580	26,683
Holmes Lump	13,526		13,526	7,349
Holmes Crushed	18,688	31,206	49,894	55,176
Junction Bessemer	19,368	40,194	59,562	
Junction	35,185	181,748	216,933	55,955
Total	86,767	273,728	360,495	145,163

As shipments were much in excess of production there is now ample room to stock all grades this season. The Junction stockpile south of Excelsior Street was cleaned up.

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c. Stockpile Inventories:

Grade	Tons
Holmes Bessemer	36,909
Holmes Lump	2,723
Holmes Crushed	6,674
Junction Bessemer	11,368
Junction	77,519
Total	135,193

On Dec. 31st, 1925 there was in stock 304,330 tons, 169,137 tons more than this year.

d. Division of Product by Levels:

The ore hoisted from the various levels was as follows:-

Third Level	152,850 Tons
Fourth Level	19,378 "
Total	172,228 "

e. Production by Months:

Month	Holmes Bessemer Tons	Holmes Lump Tons	Holmes Crushed Tons	Junction Bessemer Tons	Junction Tons	Total Tons
Jan.	3,772		2,052	2,524	5,852	14,200
Feb.	2,094		2,244	2,872	5,856	13,066
Mar.	2,231		3,040	2,288	6,831	14,390
April	3,167	85	1,788	2,072	6,393	13,505
May		2,207	3,364	2,353	5,697	13,621
June		1,674	3,820	2,760	6,174	14,428
July		1,998	2,772	4,228	5,991	14,989
Aug.		1,990	3,151	4,472	6,782	16,395
Sept.		2,210	3,178	4,633	5,348	15,369
Oct.		2,073	2,963	3,639	5,910	14,585
Nov.		1,918	3,153	3,311	5,434	13,816
Dec.		2,094	2,761	5,244	3,765	13,864
Total	11,264	16,249	34,286	40,396	70,033	172,228
Overrun	13,000		2,000	4,130		19,130
Total	24,264	16,249	36,286	44,526	70,033	191,358

f. Ore Statement:

	Holmes Bess.	Holmes Lump	Holmes Cr.	Junc. Bess.	Junc.	Total	Total Last Year
On hand 1-1-26	33,225	-	20,282	26,404	224,419	304,330	260,993
Outpt. for yr.	11,264	16,249	34,286	40,505	69,924	172,228	170,705
Transferred				109	109		
Stkp. O'run	13,000	-	2,000	4,139	-	19,130	17,795
Total	57,489	16,249	56,568	70,930	294,452	495,688	449,493
Shipments	20,580	13,526	49,894	59,562	216,933	360,495	145,163
Bal. on Hand	36,909	2,723	6,674	11,368	77,519	135,193	304,330
Incr. in Outpt.						2,858	
Decr. in Bal. on Hand						169,137	

1926 -- 1-8 Hour Shift, 5 days per week, Jan. 1st to Dec. 31st, 1926.

1925 -- 1-8 Hour Shift, 5 days per week, Jan. 1st to Dec. 31st, 1925.

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g. Delays:

Date	Hours	Tons Lost	Cause
May 11	1½	100	Skip stuck in dump.
May 25	1	100	Main drift broke down.
June 14	1½	100	No current.
Sept. 17	1	100	No current.
Oct. 18	2	200	Bearing burnt out in engine-house.
Year	7	600	

h. Delays From Lack of Current:

Date	Hours	Tons Lost
June 14	1½	100
Sept. 17	1	100
Year	2½	200

3. ANALYSIS

a. AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1926.

Grade	Iron	Phos.	Silica
Holmes Bessemer	62.16	.036	7.26
Holmes Lump	61.42	.045	7.84
Holmes Crushed	61.81	.060	6.98
Junction Bessemer	62.29	.037	5.79
Junction	57.53	.080	8.77

b. AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1926.

	Mine		Lake Erie		
Grade	Iron	Phos.	Iron	Phos.	Moisture
Holmes Bessemer	(All Mixed)				
Holmes Lump	(All Mixed)				
Holmes Crushed	(All Mixed)				
Junction Bessemer	(All Mixed)				
Junction	57.85	.075	57.93	-	8.44

c. High Sulphur Ore:

Some high sulphur ore was encountered in the western part of the soft ore vein, and had to be left behind. Some high sulphur ore was also found in the western part of the hard ore vein along a water-course in the fault zone, and much of this ore was left behind. The sulphur in the hard ore is all in the fines, and the lump is not affected. The sulphur occurs as pyrite.

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4. ESTIMATE OF ORE RESERVES:

a. Developed Ore:

Level	Holmes Bessemer Tons	Holmes Tons	Junction Bessemer Tons	Junction Tons	Total Tons
Third	33,000	10,000	14,000	181,000	238,000
Fourth	67,000	65,000	94,000	542,000	768,000
Total	100,000	75,000	108,000	723,000	1,006,000

b. Prospective Ore:

Fourth	8,000	12,000			20,000
Below Fourth			40,000	235,000	275,000
Total	8,000	12,000	40,000	235,000	295,000
Total Ore	108,000	87,000	148,000	958,000	1,301,000

Factors Used:- Hard Ore - 9 cu. ft. per ton.
Soft Ore - 12 cu. ft. per ton.

Deductions of 10% for loss in mining and 10% for rock were made in calculating tonnage.

c. Estimated Analysis:

	Iron	Phos.	Sil.	Mang.	Alum.	Lime	Mag.	Sul.	Igni.	Moist
Holmes Bessemer										
Dried 212°	61.98	.039	6.56	.179	.267	.410	.179	.007	1.09	
Natural	59.50	.037	6.30	.172	.256	.402	.172	.007	1.05	4.00
Holmes										
Dried 212°	59.40	.100	8.13	.110	.244	.300	.220	.021	1.41	
Natural	57.08	.096	7.80	.106	.234	.288	.211	.020	1.35	3.90
Junction Bessemer										
Dried 212°	60.50	.045	7.55	.228	.178	.145	.166	.023	1.52	
Natural	52.94	.039	6.61	.200	.156	.127	.145	.020	1.33	12.50
Junction										
Dried 212°	56.67	.100	8.50	.244	.283	.141	.161	.029	.509	
Natural	51.00	.090	7.65	.220	.255	.127	.145	.026	4.58	10.00

The ore reserves decreased only 120,000 tons during the year, whereas production was 172,228 tons. No new ore opened, but some ore, particularly in the western part of the hard ore vein, was wider than estimated.

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5. LABOR AND WAGES:

a. Comments:

1. Labor:

Labor conditions at the mine were satisfactory throughout the year. There were short periods when there was a slight shortage in the number of men working, due to sickness or harvesting, but the available supply was at all times adequate.

There was no change in the wage scale during the year.

b. Comparative Statement of Wages and Product:

	1926	1925	INCREASE	DECREASE
*PRODUCT	172,228	170,705	1,523	
No. Shifts & Hours	1-8	1-8		
AVG. NO. MEN WORKING:				
Surface	45	47		2
Underground	106	108		2
Total	151	155		4
AVG. WAGES PER DAY:				
Surface	4.41	4.43		.02
Underground	5.31	5.32		.01
Total	5.04	5.05		.01
**WAGES PER MO. OF 25 DAYS:				
Surface	110.25	110.75		.50
Underground	132.75	133.00		.25
Total	126.00	126.25		.25
*PRODUCT PER MAN PER DAY:				
Surface	14.70	14.02	.68	
Underground	6.25	6.05	.20	
Total	4.38	4.23	.15	
LABOR COST PER TON:				
Surface	.300	.316		.016
Underground	.851	.879		.028
Total	1.151	1.195		.044
AVG. PRODUCT BRK'G & TRM'G	8.75	8.63	.12	
" WAGES CONTRACT MINERS	5.59	5.63		.04
" " " LABOR	5.59	5.63		.04
TOTAL NO. OF DAYS:				
Surface	11,715	12,180		465
Underground	27,577	28,208		631
Total	39,292	40,388		1,096
AMOUNT FOR LABOR:				
Surface	51,682.86	53,998.58		2,315.72
Underground	146,517.56	150,063.94		3,546.38
Total	198,200.42	204,062.52		5,862.10

Proportion Surface to Underground Men:

1926 - 1 to 2.36 1926 1-8 hr. shift 5 days per week.
1925 - 1 to 2.30 1925 " " " " "
1924 - 1 to 2.23 1924 1-8 hr. shift from Jan. 7th.
1923 - 1 to 3.01 " " " 4 days pr wk. 7-30 to 12-1.
1922 - 1 to 2.78 " " " 5 " " from 12-1.
1921 - 1 to 2.63
1920 - 1 to 2.87

*Note:- Based on production without stock-pile overrun.

** Mine works 22 days per month.

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6. SURFACE:

a. Buildings and Repairs:

(1) Pump:

Early in January the crank-shaft on the Aldrich pump underground broke and a new one was not received until April 22nd. The pump was started on April 26th. In the meantime all pumping was done with the centrifugal pump only. The power-cost was higher as a consequence, and pumping had to be done at night in order to get higher voltage.

(2) Crusher:

On February 17th a piece broke out of the big gear of the No. 8 gyratory crusher and wrecked the gear, pinion and one bearing. Hard ore production was held up as a consequence for three days.

The No. 6 crusher for hard ore was repaired and new concaves put in early in the year. In August it was taken down and sent to the Morris-Lloyd Mine, and was replaced by a No. 5 crusher from the Cliffs Shaft Mine.

The No. 6 crusher for soft ore had a new mantle and new concaves put in late in the year.

(3) Office:

On the evening of July 16th nearly one fourth of the office roof was torn off by a high wind. It was replaced the next day. The damage to the interior was slight.

b. Stockpiles:

The stockpile of Junction ore south of Excelsior Street was loaded out during the summer. There remains here about 200 tons of ore, which will have to be cleaned up by hand.

The south end of the other Junction stockpile was also loaded out, leaving plenty of room for this winter's product. The stockpiles of Junction Bessemer and Holmes Crushed were shipped, except a small rill on one side. No Holmes Bessemer is now being stocked, but Holmes Lump and Holmes Crushed are being stocked on the Holmes ground.

c. Tracks, Roads & Transmission Lines:

Road:

The road between the rock-pile and the dry was widened and straightened to make safer passing for the 1½ ton truck, which was purchased in the spring to replace the team.

Transmission Line:

A transmission line was built from the Holmes Mine to the Section 16 Mine by the Cliffs Power & Light Co. late in the year.

d. Subsidence:

The surface of the ground near the southeast corner of the property, where most of the ore has been mined, has gone down rapidly, and several new cracks have appeared further north and west. The point of inflow of water from the hanging-wall underground has shifted over 100 feet west, indicating that new cracks have opened in the rock over the ore.

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7. UNDERGROUND:

a. Shaft Sinking:

No shaft sinking was undertaken during the year.

b. Development:

Third Level:

Raise 311 was put up from the third level to the 355 foot sub-level in the hard ore vein.

Fourth Level:

Starting at the end of the straight drift to the south-east, 140 feet east of the cross-cut to the shaft, a new drift was driven south-east through the middle of the ore-body for 247 feet, of which 190 feet was in ore. A new raise, No. 490, was put up from this drift 60 feet from the end.

Raises 452, 468 and 470 were put up from the 240 foot sub-level to the third level, and Raises 450, 453 and 470 from the fourth level to the third. Raises 451 and 490 were put up from the fourth level to the 240 foot sub-level, and No. 490 is now twenty feet above the level. These two raises were badly mixed with rock. Raise 455 was put up from the fourth level to the 280 foot sub-level. All these raises are in the east end of the ore-body, where stoping has already started below the third level.

Two new sub-levels, the 270 and 260, twenty and thirty feet respectively below the third level, were opened during the year near the southeast corner of the property.

c. Stoping:

The number of contracts remained the same as in 1925. The average classification for the year is as follows:-

Stoping	-	20	Contracts
Drifting & Raising in Ore	-	15	"
Drifting & Raising in Rock	-	1	"
Total	-	36	"
Hard Ore Vein	-	14	Contracts
Soft Ore Vein	-	21	"

Much rock drifting was done by contracts classified as on ore, because it was incidental to their work. For this reason the production of rock from the mine is much larger than the classification of contracts would indicate.

Hard Ore Vein:

An average of fourteen contracts was distributed over seven sub-levels from the 345 foot sub-level on the west to the 280 foot sub-level on the east. On the 320, 330 and 340 foot sub-levels west of No. 6 cross-cut on the third level, which goes to the shaft, the ore was wider than expected, but there is a fault passing through here, and it carried a good deal of sulphur in places, so that some of the ore had to be left behind.

The 355 foot sub-level was finished at the west end of the vein, and in the latter part of the year mining in the hard ore vein was started on the 280 foot sub-level, ten feet below the third level.

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355 Foot Sub-Level:

The ore was mined in an open stope for 100 feet in length northwest of Raise 317. All the ore above this level has been mined.

345 Foot Sub-Level:

One gang is opening this sub-level from Raise 311.

A pillar of ore between Raises 323 and 363 was mined early in the year.

340 Foot Sub-Level:

Four gangs worked here a large part of the year and finished the ore remaining unmined between Raise 361 and Raise 314, a distance of 350 feet.

330 Foot Sub-Level:

The ore east of Raise 317 has been mined for a length of 300 feet. Three contracts are finishing the last of the ore near their raises.

320 Foot Sub-Level:

Three gangs are opening up in raises 361, 363, and 365. The ore for 40 feet east and west of Raise 360 was mined early in the year.

310 Foot Sub-Level:

The ore north and south of Raise 341 was mined early in the year, and the ore north and west of raise 360 has been opened up and stoping started.

300 Foot Sub-Level:

The ore contiguous to Raises 341, 338 and 468 has been mined. No one was working on this sub-level at the end of the year.

Third Level:

An area 200 feet long along the south boundary and averaging 100 feet wide between Raises 461 and 465 has been mined. Two gangs are still stoping along the north-west limits of this ore.

280 Foot Sub-Level:

Three gangs are mining between Raises 461 and 463, and have finished the greater part of the ore around these raises. This ore is relatively soft, and is easily mined.

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Soft Ores:

There are twenty-one contracts working along the foot-wall and in the northern part of the vein in successive sub-levels from the 345 foot sub-level on the north-west to the 260 foot sub-level on the south-east. Work was done on the 355 foot sub-level early in the year, but there is no one working there now.

355 Foot Sub-Level:

A body of ore with very irregular outline extending over a length of 150 feet north and west from Raise 323 was mined early in the year. In one place this ore was followed up on the foot-wall above the second level.

Another body of ore adjacent to Raises 320 and 322, 150 feet long and 60 feet wide was also mined. Some of this ore was high in sulphur.

345 Foot Sub-Level:

North of Raise 321 a body of ore lying in the foot-wall, roughly 150 feet long and 30 feet wide was mined by two gangs.

Another body of ore slightly larger, lying 100 feet to the south-west of the above, was mined from Raises 320 and 322. One gang is finishing up here. This place also had some high sulphur ore.

340 Foot Sub-Level:

The ore east of No. 6 cross-cut on the third level (the cross-cut that goes to the shaft) has been nearly all mined for a length of 300 feet. This ore is badly cut up by dikes and the outline is irregular. Four gangs are still working here.

330 Foot Sub-Level:

The best ore in this vein has been mined on this and the 320 foot sub-level. An area on this sub-level 260 feet long and over 100 feet wide has been mined from Raise 346 west, finishing everything as far west as No. 3 cross-cut on the third level.

320 Foot Sub-Level:

In the ore east of No. 3 cross-cut, there are eight gangs stoping and drifting spread out over an area 250 feet long and 120 feet wide. The eastern 150 feet of this ore is practically finished. It is good ore, largely bessemer, but is badly cut up by small dikes.

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310 Foot Sub-Level:

Three gangs are opening up between raises 345 and 348, and some ore was mined south of raise 347 earlier in the year.

300 Foot Sub-Level:

The ore south and west of raises 350 and 347 was finished early in the year. No one is working here now.

Third Level:

The ore south of raises 347 and 350 has been mined, and that west as far as raises 452 and 453 is being opened up for mining.

280 Foot Sub-Level:

The ore between raises 460 and 461 and the boundary has been mined as far west as raise 462 and as far north as the dike.

270 Foot Sub-Level:

The ore adjacent to raise 460 has been mined. It lies in two troughs between dikes. One gang has also started opening up west of raise 461.

260 Foot Sub-Level:

This sub-level is being opened from raise 460. One gang has drifted north 60 feet.

d. Timbering:

The cost of keeping levels open has been higher in 1926. There are now three gangs repairing, where we used to get along with two. This is due largely to the sub-levels getting down so close to the back of the third level in the eastern part of the mine.

The timber put in the fourth level in 1919 and 1920 is quite rotten, and lining sets have been put in over a large part of this level.

The cost of unloading timber was high in January and February.

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d. Timbering: (Continued)

Statement of Timber Used:

KIND	LINEAR FEET	AVG. PRICE PER FOOT	AMOUNT 1926	AMOUNT 1925
6" to 8" Timber	73,334	.04037	$ 2,960.64	$ 2,947.84
8" to 10" "	43,772	.06128	2,682.51	2,072.08
10" to 12" "	31,356	.07992	2,506.13	2,083.84
12" and larger	21,176	.09532	2,018.65	1,733.31
Total 1926	169,638	.05993	$ 10,167.93	
Total 1925	151,475	.0583		$ 8,837.07
5' Lagging Lin. Ft.	707,412	.8212C'	5,709.46	5,192.67
7' "				210.30
Total Lagging	707,412	.8212	5,709.46	5,402.97
Poles	277,274	1.1672	3,236.39	3,039.55
Total Lagg.,Poles	1,154,324	1.656C'	$ 8,945.85	
" " 1925				$ 8,442.52

Product	191,358	188,500
Ft. Timber per ton of Ore	.886	.804
" Lagging " " "	3.696	3.383
" " per ft. of timber	4.161	4.210
Cost per Ton - Timber	.0531	.0469
" " - Lagging	.0298	.0287
" " - Poles	.0169	.0161
" " - All Timber	.0998	.0917
Ft. Brd. Measure per ton of Ore	1.62	1.53

Cost for Timber, Lagging & Poles, 1926	$ 19,113.78	
Cost for Timber, Lagging & Poles, 1925		$ 17,279.59

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e. Drifting and Raising:

Only 57 feet of development rock-drifting was done in 1926, but there was accummulated a large footage incidental to stoping. All the ore and rock raising was development work.

Year	Rock Drifting	Ore Raising	Rock Raising	Ore Drifting
1925	1,460	533	128 feet	288 ft.
1926	1,330	457	254 feet	314 ft.

f. Explosives, Drilling and Blasting

All hollow steel was sharpened at the Cliffs Shaft Mine after May first.

In the second half of the year the soft ore became much harder and tougher, harder to drill and harder to break, but some of the hard ore was softer than it had been.

STATEMENT OF EXPLOSIVES USED FOR BREAKING ORE

Kind	Quantity	Av'g. Price	1926	1925
50% L. F. Powder		14.50		1123.75
60% " "	92,400	15.04	13895.00	10834.50
60% " Gelatin	7,200	16.06	1156.03	711.88
80% " "	2,300	20.48	471.00	63.00
Total Powder	101,900	15.23	15522.03	12733.13
Fuse	305,200	.6375	1945.65	1391.62
Caps	80,000	1.063	850.03	620.17
Tamping Bags	28,730	2.15	61.78	10.75
Cap Crimpers		1.00		9.00
Total Fuse, etc.			2857.46	2031.54
Total Explosives			18379.49	14764.67
Product			191,358	188,500
Lbs. Powder per ton ore			.5325	.4361
Cost per ton for powder			.0811	.0675
" " " " fuse, etc.			.0149	.0108
" " " " explosives			.0960	.0783
Av'g. price per lb. powder			.1523	.1549

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8. COST OF OPERATING:

a. Comparative Mining Costs:

	1926	1925	Increase	Decrease
PRODUCT	191,358	188,500	2,858	
Underground Costs	1.222	1.241		.019
Surface Costs	.220	.238		.018
General Mine Accounts	.106	.110		.004
Cost of Production	1.548	1.589		.041
Plant Account	.002	.002		
Taxes	.328	.309	.019	
Central Office	.100	.098	.002	
Contingent Expense	.044	.074		.030
Cost Adjustment	.020	.012	.008	
Cost on Stockpile	2.042	2.084		.042
Loading and Shipping	.096	.042	.054	
Cost on Cars	2.138	2.126	.012	
No. Days Operating	260	260		
No. Shifts and Hours	1 - 8	1 - 8		
Average Daily Product	736	725	11	
COST OF PRODUCTION:				
Labor	1.044	1.093		.049
Supplies	.504	.496	.008	
Total	1.548	1.589		.041

The stockpile overrun taken up into production in 1926 was slightly larger than in 1925, but there was a general improvement in efficiency which resulted in lower cost of production.

Increases in Taxes, Central Office and Cost Adjustment offset the decrease in Contingent Expense.

The only important increase was in Loading and Shipping, which more than doubled in 1926 on account of the large shipments.

b. Detailed Cost Comparison:

The mine worked the same number of contracts and the same number of days in both years, but produced a little more ore with a few less men in 1926. There were no fatal accidents in either year, and very little new construction was undertaken.

The comparison of the different accounts follows:-

UNDERGROUND COSTS:

Development in Rock:

1925	$ 13282.37	$ .071
1926	11814.84	.062
Decrease	$ 1467.53	$ .009

In 1925 1588 feet cost $ 8.36 per foot. In 1926 1584 feet cost $ 7.46 per foot.

Development in Ore:

1925	$ 4083.55	$ .022
1926	4331.46	.023
Increase	$ 247.91	$ .001

The increase is due to the main drift on the fourth level.

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8. COST OF OPERATING: (Continued)

UNDERGROUND COSTS: (Continued)

Stoping:			Explosives decreased $ 328 and other supplies, drill-steel, etc. increased $ 678. Labor decreased $ 2630.
1925	$ 120130.27	$ .637	
1926	117861.19	.616	
Decrease	$ 2269.08	$ .021	
Timbering:			The cost of timber decreased $ 445, and other supplies decreased $ 120. Labor increased $ 1050.
1925	$ 42117.54	$ .223	
1926	42601.14	.223	
Increase	$ 483.60	$ .000	
Tramming:			Labor decreased $ 1698.
1925	$ 16887.83	$ .090	
1926	15176.71	.079	
Decrease	$ 1711.12	$ .011	
Ventilation:			Charges were higher in 1925 on account of building fire-doors.
1925	$ 558.12	$ .003	
1926	220.16	.001	
Decrease	$ 337.96	$ .002	
Pumping:			For nearly four months all pumping was done with the centrifugal pump on night shift, on account of a broken shaft on the plunger-pump. This required more power and an extra hoisting engineer. There was more rainfall and more water to pump in 1926. Surface pumping charges were charged to this account after Dec. 1st, 1925. The increase is $ 421. Electric power increased $ 3270.
1925	$ 6232.11	$ .033	
1926	9769.46	.051	
Increase	$ 3537.35	$ .018	
Compressors and Air Pipes:			Labor decreased $ 313.
1925	$ 12507.89	$ .066	
1926	12112.43	.063	
Decrease	$ 395.46	$ .003	
Back Filling:			In 1926 No. 32 contract worked for a month breaking rock in their stope.
1925	$	$	
1926	510.71	.003	
Increase	$ 510.71	$ .003	
Underground Superintendence:			The increase is in the captain's salary.
1925	$ 8080.22	$ .043	
1926	8209.09	.043	
Increase	$ 128.87	$ .000	

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8. COST OF OPERATING: (Continued)

UNDERGROUND COSTS: (Continued)

MAINTENANCE ACCOUNTS:

Compressors and Power Drills:

1925	$ 607.04	$ .003	In 1925 two drills cost $ 340. In 1926 eight drills cost $ 1363.30.
1926	1616.15	.008	
Increase	$ 1009.11	$ .005	

Hand Tramming Equipment:

1925	$ 3562.98	$ .019	Labor increased $ 127 in 1926. In 1925 two scraper-hoists cost $ 1301.
1926	2548.45	.013	
Decrease	$ 1014.53	$ .006	

Electric Tram Equipment:

1925	$ 5354.02	$ .028	Labor decreased $ 703. Main line cars supplies decreased $ 39 and locomotives $ 155.
1926	4521.39	.024	
Decrease	$ 832.63	$ .004	

Pumping Machinery:

1925	$ 515.70	$ .003	A new crank-shaft was purchased in 1926 for $ 1508. Labor on this account increased $ 372.
1926	2513.47	.013	
Increase	$ 1997.77	$ .010	

SURFACE COSTS:

Hoisting:

1925	$ 11493.62	$ .061	Electric power charges decreased $ 197.
1926	11278.00	.059	
Decrease	$ 215.62	$ .002	

Stocking Ore:

1925	$ 9197.90	$ .049	Timber decreased $ 678, and other supplies $ 239. Balance is labor building trestles.
1926	7716.37	.040	
Decrease	$ 1481.53	$ .009	

Screening-Crushing at Mine:

1925	$ 4298.83	$ .023	Supplies increased $ 1047 on account of repairs to screens and new concaves in crushers. Balance is labor.
1926	5488.74	.029	
Increase	$ 1189.91	$ .006	

Dry House:

1925	$ 5454.10	$ .029	Labor decreased $ 80 and heating expense $ 80.
1926	5244.64	.027	
Decrease	$ 209.46	$ .002	

General Surface Expense:

1925	$ 6675.32	$ .035	In 1925 $ 317.18 was charged to this account for Oliver Iron Mining Co. surface pumping. This was charged to "Pumping" in 1926. Labor increased $ 80.
1926	6447.37	.034	
Decrease	$ 227.95	$ .001	

MAINTENANCE ACCOUNTS:

Hoisting Equipment:

1925	$ 1705.22	$ .009	Labor increased $ 416, mostly on skips. A new skip rope cost $ 444 in 1925 and $ 401 in 1926.
1926	2283.69	.012	
Increase	$ 578.47	$ .003	

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8. COST OF OPERATING: (Continued)

SURFACE COSTS: (Continued)

Shaft:			
1925	$	403.21	$ .002
1926		322.19	.002
Decrease	$	81.02	$ .000

Top Tram Equipment:			
1925	$	1032.37	$ .005
1926		802.06	.004
Decrease	$	230.31	$ .001

In 1925 new rope cost $ 209. In 1926 no new rope was used.

Docks, Trestles and Pockets:			
1925	$	2024.73	$ .011
1926		1759.22	.009
Decrease	$	265.51	$ .002

Labor decreased $ 347. Supplies increased $ 80 on account of repairs to trestle.

Mine Buildings:			
1925	$	2585.07	$ .014
1926		727.89	.004
Decrease	$	1857.18	$ .010

In 1925 the roof was blown off the office and part of the engine-house, and the gable of the dry was blown in. In 1926 part of the office roof was blown off.

GENERAL MINE ACCOUNTS:

Insurance:			
1925	$	41.67	$ .000
1926		47.88	.000
Increase	$	6.21	$ .000

Engineering:			
1925	$	1626.41	$ .009
1926		1582.49	.008
Decrease	$	43.92	$ .001

This is a Central Office charge.

Analysis:			
1925	$	6970.42	$ .037
1926		6744.78	.035
Decrease	$	225.64	$ .002

Central laboratory charges decreased $ 182.

Personal Injury Expense:			
1925	$	2434.47	$ .013
1926		2226.51	.012
Decrease	$	207.96	$ .001

Central Office charge.

Safety Department Expense:			
1925	$	205.11	$ .001
1926		224.31	.001
Increase	$	19.20	$ .000

Telephones and Safety Devices:			
1925	$	114.62	$ .001
1926		100.28	.001
Decrease	$	14.34	$ .000

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8. COST OF OPERATING: (Continued)

GENERAL MINE ACCOUNTS: (Continued)

Local General Welfare:

1925	$ 560.46	$ .003
1926	523.95	.003
Decrease	$ 36.51	$ .000

Mine Office:

1925	$ 8699.81	$ .046
1926	8861.57	.046
Increase	$ 161.76	$ .000

Direct charges increased $ 313. Heating decreased $ 17.

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9. EXPLORATIONS AND FUTURE EXPLORATIONS

In 1927 it is planned to put down at least four diamond-drill holes from the fourth level to test the depth of the ore, so that plans can be made for the fifth level. The fifth level should be opened up and ready by the end of 1928.

10. TAXES

The assessed valuation of the realty decreased $208,000.00, but that of the personal property was increased $278,000.00, so that the total valuation increased $70,000.00. Total taxes increased $4,528.71, or $ .024 per ton.

COMPARATIVE STATEMENT OF TAXES FOR YEARS 1926 AND 1925

	1926		1925	
	Valuation	Taxes	Valuation	Taxes
Realty - SW of SE Sec. 9-47-27	$ 867,000	$ 28,374.36	$ 1,075,000	$ 33,895.12
Personal	1,033,000	33,810.00	755,000	23,805.37
Total	$ 1,900,000	$ 62,184.36	$ 1,830,000	$ 57,700.49
Collection Fees		621.84		577.00
Total		$ 62,806.20		$ 58,277.49

13. EQUIPMENT AND PROPOSED EQUIPMENT

a. Tugger Hoists and Scrapers:

The mine has five double-drum tuggers and scrapers, and is to receive four more from the Cliffs Shaft Mine, when the latter has been entirely equipped with electric hoists.

On account of the rock seams so commonly found in the ore at the Holmes Mine, scrapers can be used in only a small proportion of the contracts, and then only part of the time. The direct saving, where they can be used, amounts to approximately 10 cents a ton.

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18. NATIONALITY OF EMPLOYES:

English	61
Finnish	34
Scandinavian	33
French Canadian	13
Italian	2
German	1
Irish	3
Total	147

This classification is based on the nationality of the father at birth and not on the man's nationality at his birth. Practically all employees are United States citizens, and a large percentage are American born. Some are of mixed parentage.

MORRIS-LLOYD MINE

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1. GENERAL:

The Morris-Lloyd property, despite loss of production due to closing down the Morris shaft on November 3rd, shows progress for 1926. The tons per man per day shows a healthy increase over previous years. The cost on cars, notwithstanding extraordinary expenses in November and December, is less than last years. There were four months in the year when the total cost on cars averaged only $1.95 per ton.

The development work during the year did not increase our ore reserves over last year, due to the fact that some tonnage, in the Morris shaft, is not reported to the Tax Commission since the concrete dams, that were built to safe-guard the mine, tie up ore that must be left to support the pillars underneath the dams. Furthermore, in the Lloyd East, no development work was carried on to increase ore reserves.

Shipments were a disappointment and as a result, we must have over 500,000 tons of ore in stock when the over-run is included.

Increased efficiency was obtained underground by adding more scrapers to our underground equipment.

The detailed report follows divided into two parts, the first covering Morris-Lloyd operations and the last portion dealing with the Barnes-Hecker.

2. PRODUCTION, SHIPMENTS & STOCKPILE BALANCES:

a. Production by Grades:

The following table shows ore produced each year since 1920:-

Year	Morris	Silica	Lloyd	Lloyddale	Total
1920	45,572	63,873	105,327	45,000	261,772
1921	68,593	45,529	84,741	171	209,034
1922	109,227	22,850	89,902		221,979
1923	132,413	25,147	101,145	1,630	260,335
1924	76,038	69,253	88,672	12,393	246,356
1925	100,568	59,945	105,316		265,829
1926	114,299*	53,088	49,678	73,097	290,162

*Note. This total includes 3436 tons of Morris shipped as High-Manganese.

Following is a table showing each grade produced in 1926 in detail:-

Grade	Tons
Lloyd	49,678
Lloyddale	73,097
Lloyd Silica	13,279
Morris	110,863
Morrisville	39,809
High Manganese	3,436
Total for 1926	290,162

The Morris shaft did not operate after November 3rd, but nevertheless, we produced 10% more ore in 259 days than was done in 1923 in 295 days with a larger crew of men.

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2. PRODUCTION, SHIPMENTS & STOCKPILE BALANCES: (Continued)

b. Shipments:

Shipments were a disappointment. We only forwarded 224,775 tons as Athens ore was substituted for Morris in the Cliffs Group and Lake was used instead of Lloyddale in the Stephenson Mixture.

We hope the Sales Department can materially increase our sales in 1927.

Shipments by Grades:

Grades	1920	1921	1922	1923	1924	1925	1926
Morris	37,402	7,868	118,858	45,394	27,084	122,435	86,413
Morris Manganese							3,259
Lloyd	111,922	38,582	96,571	80,267	104,115	67,953	33,948
Lloyddale	11,438		42,742	20,390	25,171		67,119
Total Non-Bess.	160,762	46,450	258,171	146,051	156,370	190,388	190,739
Morris Bessemer	7,789						
Total Bessemer	7,789						
Morrisville	256	4,620	8,117	39,773	80,975	28,673	12,372
Lloyd Silica	31,581	14,780	27,627	24,868	31,883	21,084	21,664
Total Silica	31,837	19,400	35,744	64,641	112,858	49,757	34,036
Grand Total	200,388	65,850	293,915	210,692	269,228	240,145	224,775

The following table shows the destination of the various ores shipped last year:-

	Grade					
Destination	Lloyd	Lloyddale	Lloyd Silica	Morris	Morris Mang.	Morrisville
L. S. & I. Dock	1,406	67,119	84	26,939	237	8,786
C. & N. W. "	1,802			1,519		3,583
Marquette Furnace	9,706		6,012	11,143	2,977	
Antrim Iron Co.				14,326	45	
Cadillac Furnace			8,157	21,451		
Wells "	18,755		4,062			
Newberry "	269		3,350	11,035		
East Jordan	2,009					
Total	33,947	67,119	21,665	86,413	3,259	12,372

Out of a total shipment of 224,775 tons, the Charcoal furnaces took 116,880 tons or 52%.

c. Stockpile Balances:

Stockpile Balances as of Dec. 31st:-

Year	Morris	Lloyd	Lloyddale	Morrisville	Lloyd Silica	Total
1920	26,917	33,840	73,821	52,514	39,077	226,169
1921	87,371	90,270	73,992	74,849	42,871	369,353
1922	65,658	96,674	31,250	59,651	44,184	297,417
1923	137,758	132,977	12,417	31,985	31,923	347,060
1924	186,709	117,373		5,568	14,538	324,188
1925	164,842	154,733		15,759	14,538	349,872
1926	194,820	164,763	6,354	34,783	14,539	415,259

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2. PRODUCTION, SHIPMENTS & STOCKPILE BALANCES:
(Continued)

e. Production by Months From Chase Leases:

Leases	No. 9	No. 24	No. 25	No. 26	Nos. 27 & 28	Total
Minimum Yearly Tonnages Required	10,000	15,000	15,000	15,000	22,500	77,500
January	5,808	4,097	1,513	20	0	11,438
February	6,450	3,101	1,541	0	0	11,092
March	5,980	3,153	1,585	0	0	10,718
April	5,540	4,058	1,498	58	0	11,154
May	5,405	4,870	1,467	0	0	11,742
June	5,544	5,532	1,299	22	0	12,397
July	6,081	5,591	1,395	36	0	13,103
August	3,345	5,525	1,510	0	0	10,380
September	3,896	5,795	1,220	36	0	10,947
October	4,017	5,036	1,304	124	0	10,481
November	470	341	63	0	0	874
December	0	0	0	0	0	0
Totals	52,536	47,099	14,395	296	0	114,326
Over-run	566	777	1,209	7	0	2,559
Grand Total	53,102	47,876	15,604	303	0	116,885

Production by Years From Leases:

Lease No.	9	24	25	26	27	28	Totals
Minimums	10,000	15,000	15,000	15,000	15,000	7,500	77,500
Year							
1920	33,411	19,073	1,527	1,320	0	0	55,331
1921	56,794	12,075	4,843	2,075	176	0	75,963
1922	97,082	6,980	2,057	0	0	0	106,119
1923	104,522	9,148	7,109	1,831	0	0	122,610
1924	97,123	13,047	699	137	2	0	111,008
1925	77,244	29,526	10,367	2,425	0	0	119,562
1926	53,102	47,876	15,604	303	0	0	116,885

It will be noted that since 1921, we have exceeded the minimums by a comfortable margin.

Total Royalties Accrued and Production From Leases:

No. of Lease	Accrued To Dec.31,1926	Mined To Dec.31,1926	Balance
9	182,283	799,311	617,028
24	256,088	145,127	110,961
25	256,088	42,206	213,882
26	246,713	8,091	238,622
27	224,213	178	224,035
28	112,107	0	112,107
Totals	1,277,492	994,913	282,579

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2. PRODUCTION, SHIPMENTS & STOCKPILE BALANCES: (Continued)

e. We are catching up with the minimums at a rate of approximately 50,000 tons per year, so that we should have the accounts squared up in a little over five years.

Table Showing Balances Due On Accrued Royalties For Leases Nos. 9 to 28 Inclusive:

Year	Tons Accrued	Tons Mined	Balance
1920	812,492	342,766	469,726
1921	889,992	418,729	471,263
1922	967,492	524,848	442,644
1923	1,044,992	647,458	397,534
1924	1,122,492	758,466	364,026
1925	1,199,992	878,028	321,964
1926	1,277,492	994,913	282,579

f. Ore Statement:

	Morris	Morris ville	Morris Mang.	Lloyd	Lloyd-dale	Lloyd Silica	Total
On Hand Jan.1,1926	164,842	15,759		154,733		14,538	349,872
Produced in 1926	110,863	39,809	3,436	49,678	73,097	13,279	290,162
Total	275,805	55,568	3,436	204,411	73,097	27,817	640,034
Transfers	5,528	8,413	177	5,700	376	8,386	
Net Total	281,233	47,155	3,259	198,711	73,473	36,203	640,034
Shipments	86,413	12,372	3,259	33,948	67,119	21,664	224,775
Balance on Hand	194,820	34,783	0	164,763	6,354	14,539	415,259

g. Delays:

Date	Cause of Delay	Loss of Production
Mar. 8th,	Severe Snow Storm	1,100 Tons
Nov. 3,4,5&6th,	Only one shift operating because of Barnes-Hecker Cave-In	2,550 "
Nov. 8 to 30th,	Morris shut down and Lloyd & Lloyd East on two shifts	4,000 "
Month of Dec.	" " " " " "	3,500 "
Dec. 6,7,8&9th,	Skip clevis broke damaging shaft	3,200 "
	Total Loss of Production	14,350 Tons

3. ANALYSIS:

Average Mine Analysis on Output For Year 1926:

Grade	Iron	Phos	Silica
Lloyd	58.97	.113	6.25
Lloyddale	58.96	.125	6.07
Lloyd Silica	51.70	.071	16.87
Morris	58.95	.102	7.19
Morris High-Manganese	59.43	.106	5.97
Morrisville	49.31	.067	21.52

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3. ANALYSIS:
(Continued)

Average Analysis on Straight Cargoes For Year 1926:

	Mine			Lake Erie	
Grade	Iron	Phos.	Silica	Iron	Moist.
Lloyd	59.23	.121			
Lloyddale			All Mixed		
Lloyd Silica			" "		
Morris	57.85	.079		58.23	10.63
Morris High-Manganese			" "		
Morrisville			" "		

4. ESTIMATE OF ORE RESERVES:

Factor:- 12 cu. ft. per ton
10% deduction for rock
10% " " loss in mining

Following is the estimate showing ore in sight Dec. 31, 1926 that is available for mining.

MORRIS MINE

Location of Ore	Bessemer	Morris	Total Tons
Above 4th Level, C.C.I.Co. Lands,		11,257	11,257
" 6th " Chase Lease No.9,		108,992	108,992
" " " C.C.I.Co. Lands,		71,447	71,447
" 7th " Chase Lease No.9,	47,791	576,380	624,171
" " " " " No.24,		79,605	79,605
" " " " " No.25,		31,117	31,117
" " " " " No.26,		16,516	16,516
" " " C.C.I.Co. Lands,	46,150	138,452	184,602
Below " " Chase Lease No.9,	22,609	94,701	117,310
" " " " " No.24,		18,394	18,394
" " " " " No.25,		10,336	10,336
" " " " " No.26,		16,453	16,453
" " " C.C.I.Co. Lands,	15,284	45,852	61,136
Total Developed Ore	131,834	1,219,502	1,351,336
Prospective Ore			
Above 7th Level, Chase Lease No.9,		21,600	21,600
" " " C.C.I.Co. Lands,		78,840	78,840
Total Prospective Ore		100,440	100,440
Total Ore in Morris Mine	131,834	1,319,942	1,451,776

LLOYD MINE

Location of Ore	Lloyd	Lloyddale	Total Tons
Above 3rd Level,	111,116		111,116
Prospective Ore			
Below 3rd Level,	6,185		6,185
Total Ore in Lloyd Mine	117,301		117,301

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4. ESTIMATE OF ORE RESERVES:
(Continued)

LLOYD MINE EAST

Location of Ore	Lloyd	Lloyddale	Total Tons
Above 2nd Main Sub,	13,522	4,507	18,029
" 3rd " "	33,717	176,400	210,117
" 4th " "	6,927	94,933	101,860
Between 3rd Level & 4th Main Sub	27,889	120,738	148,627
Above and Below 4th Level	216,977	598,518	815,495
Total Developed Ore	299,032	995,096	1,294,128
Prospective Ore			
Above 4th Main Sub	8,606	20,082	28,698
Total Prospective Ore	8,606	20,082	28,698
Total Ore in Lloyd Mine East	307,638	1,015,178	1,322,816

SUMMARY OF TOTAL ORE

Mine	Bessemer	Morris & Lloyd	Lloyddale	Total Tons
Morris	131,834	1,319,942		1,451,776
Lloyd		117,301		117,301
Lloyd East		307,638	1,015,178	1,322,816
Total	131,834	1,744,881	1,015,178	2,891,893

Total Ore on Chase Lease No. 9, -	872,073
" " " " " No.24, -	97,999
" " " " " No.25, -	41,453
" " " " " No.26, -	32,969
Total Ore on All Leases,	1,044,494
Total Ore on C.C.I.Co. Lands,	1,847,399
Total Ore Morris-Lloyd Mine,	2,891,893

The following table shows the above tonnages sub-divided into grades as reported to the Tax Commission.

Developed Ore	Morris Shaft	Lloyd Shaft	Total
Bessemer	131,834		131,834
Non-Bessemer	1,219,502	1,405,244	2,624,746
Siliceous			
Total	1,351,336	1,405,244	2,756,580
Prospective Ore			
Bessemer			
Non-Bessemer	100,440	34,873	135,313
Siliceous			
Total	100,440	34,873	135,313
Grand Total	1,451,776	1,440,117	2,891,893

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4. ESTIMATE OF ORE RESERVES:
(Continued)

Ore Reserves:

The following statement shows the ore in sight January 1st for a number of years; the product each year; the balance on hand and the new ore developed each year.

Estimated Ore	1922	1923	1924	1925	1926
Ore in Mine Jan. 1st.	3,038,514	3,309,174	3,306,270	3,309,075	3,325,341
Production	221,979	260,335	246,356	265,829	290,162
Balance	2,816,535	3,048,839	3,059,914	3,043,246	3,035,179
Ore in Mine Dec. 31st.	3,309,174	3,306,270	3,309,075	3,325,341	2,891,893
Developed During Year	492,639	257,431	249,161	282,095	143,286

The ore reserves show a shrinkage due partly to ore tied up in pillars underneath dams built on 3rd and 4th levels Morris Mine and partly due to No. 8 deposit, in the Lloyd East, proving up much smaller than originally estimated.

5. LABOR AND WAGES:

a. General:

The labor conditions at this property were satisfactory during the year. Labor was much more abundant than in 1925, due I believe, to the slowing down of the Ford operations at Iron Mountain and L'Anse.

b. Comparative Statements:

Product - Shifts - Hours:

	1926	1925	Increase
Product	290,162	265,829	24,333
No. of Shifts & Hours	1-8	1-8	

Average Number of Men Employed:

Year	Surface	Underground	Total
1921	46	203	249
1922	48	162	210
1923	44	156	200
1924	44	144	188
1925	45	145	190
1926	45	149	194

Increase for 1926 - 4 Men

Average Wages Per Day:

Year	Surface	Underground	Total
1926	4.32	5.02	4.85
1925	4.34	5.02	4.86
1924	4.29	4.94	4.78
1923	4.12	4.65	4.53
1922	3.72	4.19	4.08

No change in underground rate for 1926 compared with last year but surface rate decreased .02.

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5. LABOR AND WAGES:

b. Comparative Statements:

Product - Shifts - Hours:

(Continued)

Wages Per Month of 25 Days:

	1926	1925	Increase	Decrease
Surface	108.00	108.50		.50
Underground	125.50	125.50		
Total	121.25	121.50		.25

Product Per Man Per Day:

Year	Surface	Underground	Total
1920	17.67	4.33	3.48
1921	18.78	4.22	3.44
1922	17.40	5.33	4.08
1923	18.47	5.58	4.28
1924	19.08	6.42	4.80
1925	20.45	6.85	5.13
1926	21.42	6.97	5.26
First 10 Months 1926	22.87	7.31	5.54

	1926	1925	Increase	Decrease
Surface	21.42	20.45	.97	
Underground	6.97	6.85	.12	
Total	5.26	5.13	.13	

It will be noted that 1926 shows some improvement over 1925 which would have been more marked if the Morris shaft could have operated throughout the year. The average for the first ten months, when things were going at a normal rate, was 5.54.

Labor Cost Per Ton:

Year	Surface	Underground	Total
1920	.307	1.482	1.791
1921	.242	1.248	1.490
1922	.214	.786	1.000
1923	.223	.834	1.057
1924	.225	.770	.995
1925	.212	.733	.945
1926	.201	.721	.922
First 10 Months 1926	.189	.691	.880

	1926	1925	Increase	Decrease
Surface	.201	.212		.011
Underground	.721	.733		.012
Total	.922	.945		.023

	1926	1925	Increase	Decrease
Average Product Stoping & Tramming	11.76	11.59	.17	
" Wages Contract Miners	5.45	5.48		.03

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5. LABOR AND WAGES:

b. Comparative Statements:

Product - Shifts - Hours:
(Continued)

Number of days Labor Statement:

Year	Surface	Underground	Total
1922	12,715¼	41,618¼	54,333½
1923	14,083	46,666¼	60,749¼
1924	12,911½	38,384¾	51,296¼
1925	12,998	38,798¼	51,796¼
1926	13,544¾	41,616	55,160¾

	1926	1925	Increase	Decrease
Surface	13,544¾	12,998	546¾	
Underground	41,616	38,798¼	2,817¾	
Total	55,160¾	51,796¼	3,364½	

Amount For Labor:

Year	Surface	Underground	Total
1922	$47,387.29	$174,481.44	$221,868.73
1923	58,007.55	217,099.94	275,107.49
1924	55,422.26	189,689.21	245,111.47
1925	56,432.49	194,847.06	251,279.55
1926	58,448.93	208,934.14	267,383.07

	1926	1925	Increase	Decrease
Surface	$58,448.93	$56,432.49	$2,016.44	
Underground	208,934.14	194,847.06	14,087.08	
Total	267,383.07	251,279.55	16,103.52	

Proportion Surface to Underground Men:

1926	1 to 3.31
1925	1 to 3.22
1924	1 to 3.27

6. SURFACE:

A. Mine Buildings:

The crusher building at the Lloyd shaft, housing the crusher, screen and heating plant, was gunited.

We also made the tunnel leading from the Lloyd timber yard to the shaft, fire-proof by covering the old legs and caps with expanded metal and gunite.

b. Stockpile Trestles:

A new trestle was erected along the North side of the Lloyddale pile and we are trying to keep the Lloyd and Lloyddale grades separated. Some attempt should have been made to do this in previous years as the Lloyd dumped on the stockpile since 1922, has been running above .135 Phos. In 1924, for instance, the Phos. averaged .142, whereas, the guarantee on the Lloyd grade is .120 or less. Anything above .120 cannot be used by the Charcoal furnaces.

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6. SURFACE:

c. Tracks, Roads Etc.:

We put up snow fences this year to try to keep the snow from drifting over the Lloyd timber tracks. It probably would be advisable to cover these tracks with a wooden structure sheathed with iron, similar to the Negaunee Mine and Athens timber tunnels.

7. UNDERGROUND:

a. Shaft Sinking:

At the close of the year, we were getting ready to sink the Morris shaft another lift. It takes three or four years to open a new level properly and we have only about five years life above the 7th level in all, except the two large deposits known as Nos. 21 and 33.

b. Development:

A great deal of development work was carried on in the Morris shaft. The ore bodies here are so irregular in dip and strike, that the only way to determine the ore areas, is to raise in the ore and cut out subs and drive small drifts. Towards the latter part of the year, half of our mining gangs were on development work. Several main level drifts were driven on the 6th level Morris to develop ore found by diamond drilling.

c. Stoping:

Due to the more general adoption of scrapers, our stoping tons per miner shows another increase for 1926 compared with previous years.

Stoping Tons Per Man:

Year	Tons
1919	8.75
1920	9.27
1921	10.20
1922	13.82
1923	15.54
1924	15.67
1925	17.10
1926	17.33

Production from the main #24 sub stope was stopped early in the year, because of the large amount of Siliceous material mixed with the ore.

d. Timbering:

This expense increased for 1926, due partly to the large number of raises put up during the year. We still have considerable expense added each month repairing the long raises in the Lloyd East leading down 500 feet to the main tramming level. We used an unusual number of 9½ foot poles, the consumption going up three times. It paid us, however, to stop the use of 8 foot lagging and covering boards and substitute the longer tamarack poles, as the working places rarely caved down and very little fore-poling was done. We also used a larger proportion of 8" to 10" mine stull timber, as that size is usually a drug on the market and can be purchased more cheaply.

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7. UNDERGROUND:

d. Timbering:

Timber Statement:

	Lineal Feet	Avg. Price Per Foot	Amount 1926	Amount 1925
6" to 8" Timber	75,981	.04	3,039.18	3,322.72
8" to 10" "	59,578	.0706	4,206.27	2,255.05
10" to 12" "	47,159	.0925	4,361.63	3,434.91
12" to 14" "	5,944	.1094	650.45	922.74
Treated Stulls	540	.328	177.07	
Total Timber 1926	188,202	.0661	12,434.60	9,935.42
" " 1925	162,152	.0613	9,935.42	
		Per 100'		
5' Lagging	141,100	.846	1,194.07	1,420.08
8' "	519,784	.757	3,936.69	3,287.30
Total Lagging	660,884	.776	5,130.76	4,707.38
3" Poles	290,483	1.236	3,590.13	1,839.61
Total Lagging & Poles 1926	951,367	.917	8,721.89	6,546.99
" " " 1925	755,778	.866	6,546.99	6,659.87
Product			290,162	265,829
Feet Timber Per Ton of Ore			.649	.61
" Lagging " " " "			3.28	2.84
" " " Ft. " Timber			5.06	3.74
Cost Per Ton For Timber			.0429	.0374
" " " " Lagging			.0177	.0177
" " " " Poles			.0124	.0069
" " " " All Timber			.0752	.0666
Equivalent of Stull Timber to Board Measure			305,676	267,581
Feet Board Measure Per Ton of Ore			1.053	1.006
Cost of Timber, Lagging, Poles Etc. - 1926			21,787.65	
" " " " " " - 1925			17,701.50	
" " " " " " - 1924			16,664.69	
" " " " " " - 1923			15,207.16	
" " " " " " - 1922			11,735.86	
" " " " " " - 1921			19,348.78	

e. Drifting and Raising:

The following table shows the amount of drifting and raising done the past three years.

Year	Total Footage	Ore Drifting	Ore Raising	Rock Drifting	Rock Raising
1924	3,107 Ft.	1,945 Ft.	803 Ft.		359 Ft.
1925	4,896 Ft.	2,794 Ft.	1,288 Ft.	390 Ft.	424 Ft.
1926	5,350 Ft.	2,249 Ft.	1,703 Ft.	868 Ft.	530 Ft.

It will be noted that the total footage of drifts and raises driven shows an increase each year.

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7. UNDERGROUND:
(Continued)

f. Explosives, Drilling and Blasting:

Extensive experiments were conducted during the year to find out the best drill for our ground. We tried out two kinds of Ingersoll-Rand machines, new Sullivan auger, Cleveland auger and a Chicago Pneumatic Co.'s drill. The R.B.12 of the Ingersoll-Rand was finally adopted as our standard. The design of the drill bit was gone into and finally a standard fixed, that has since been adopted by the Negaunee and Maas Mines.

Statement of Explosives Used For Breaking Ore:

Kind	Quantity	Average Price	Amount 1926	Amount 1925
40% Powder	75,630	.1316	9,951.60	11,414.25
60% "	73,450	.1564	11,488.27	8,891.80
Total	149,080	.1438	21,439.87	20,306.05
Fuse	488,600	6.37	3,112.62	2,522.62
Caps	88,976	10.65	947.54	834.99
Tamping Bags	63,200	2.03	128.14	136.15
Cap Crimpers	18	.492	8.85	12.03
Total Fuse Etc.			4,197.15	3,505.79
" Explosives			25,637.02	23,811.84
Product			290,162	265,829
Pounds Powder Per Ton of Ore			.514	.518
Cost Per Ton For Powder			.0739	.0764
" " " " Fuse Etc.			.0145	.0132
" " " " All Explosives			.0884	.0896
Average Price Per Lb. For Powder			.1438	.1474

8. COST OF OPERATING:

	1926	1925	Increase	Decrease
Product	290,162	265,829	24,333	
Underground Costs	1.165	1.212		.047
Surface Costs	.205	.227		.022
General Mine Accounts	.110	.134		.024
Cost of Production	1.480	1.573		.093
Original Cost	.033	.034		.001
Plant Account	.262	.263		.001
Taxes	.182	.170	.012	
Central Office	.087	.087		
Contingent Expense	.042	.069		.027
Cost Adjustment	.021	.018	.003	
Cost on Stockpile	2.107	2.214		.107
Loading and Shipping	.074	.082		.008
Total Cost on Cars	2.181	2.296		.115
No. Days Operating	259	260		1
No. Shifts and Hours	1 - 8	1 - 8		
Average Daily Product	1120	1022	98	
Cost of Production				
Labor	.949	.978		.029
Supplies	.531	.595		.064
Total	1.480	1.573		.093

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8. COST OF OPERATING:
(Continued)

Cost of Production:

Year	Production	Daily Product	Cost of Production Labor	Supplies	Total
1920	261,772	873	1.751	.734	2.485
1921	209,034	723	1.482	.870	2.352
1922	221,979	737	1.019	.699	1.718
1923	260,335	882	1.083	.682	1.765
1924	246,356	940	1.026	.658	1.684*
1925	265,829	1,022	.978	.595	1.573
1926	290,162	1,120	.949	.531	1.480

*Note. Production for 1924 includes 19,186 tons of stockpile over-run.

Cost of production for the past year is the lowest shown in above table.

9. EXPLORATION:

It is proposed to sink the Morris shaft approximately 200 feet to the eighth level in 1927 and start drifting for the ore lenses on Chase Leases Nos. 9, 24 and 25. We do not intend to develop any tonnage in the main #33 deposit, but to look for the down-ward extension of the ore lenses, farther to the West. This work must be carried on in 1927 in order to open up the new level in plenty of time to provide continuous production from the Morris shaft. The majority of the ore bodies, now being worked above the 6th and 7th levels, will be gone within the next five years.

10. TAXES:

The following tables show the amount of taxes raised in Ely and Ishpeming Townships and the total the Company pays, taxes per ton produced, per ton shipped etc.

Lloyd Mine	1925 Valuation	1925 Amount	1926 Valuation	1926 Amount
Realty	561,450	15,351.58	380,450	13,451.21
Personal	340,000	9,296.59	465,450	16,464.63
Total Lloyd & Sec.6	901,450	24,648.17	845,900	29,915.84
Morris Mine				
Realty	499,600	12,715.82	367,600	10,718.19
Personal	306,000	7,794.37	481,600	12,079.50
Total Morris	805,600	20,510.19	849,200	22,797.69
Grand Total	1,707,050	45,158.36	1,695,100	52,713.53
Product- Tons		265,829		290,162
Taxes Per Ton Produced		.1698		.1812
Shipments- Tons		240,145		224,775
Taxes Per Ton Shipped		.1879		.2322
Barnes-Hecker Mine				
Realty	28,000	712.61	53,000	1,422.86
Personal	251,000	6,388.45	240,700	6,461.68
Total Barnes-Hecker	279,000	7,101.06	293,700	7,884.54
Product- Tons		138,582		163,380
Taxes Per Ton Produced		.0513		.0482
Shipments		124,498		182,038
Taxes Per Ton Shipped		.0568		.0433

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10. TAXES:

Taxes Raised Ishpeming Township:

Tax	1924	1925	1926
State	3,438.00	3,504.98	3,221.41
County	5,975.52	5,429.85	6,760.15
County Road	4,535.22	3,293.77	3,281.91
Township Cont.	2,000.00		1,000.00
Highway Imp.	1,125.00	3,000.00	6,600.00
Road Repair	2,500.00	3,000.00	5,000.00
School	17,500.00	15,690.00	16,750.00
One Mill	1,518.42	1,310.00	1,253.00
Rejected	1.96	233.61	1.11
Total Tax	38,594.12	35,462.21	43,867.58
Tax Paid By C.C.I.Co.	31,480.63	28,059.86	34,026.34
Percentage of Tax Paid by C.C.I.Co.	81.29	78.38	77.65
Assessed Valuation	1,518,000.00	1,310,000.00	1,253,000.00
Tax Rate	2.525	2.707	3.502

Taxes Raised Ely Township:

Tax	1924	1925	1926
State	3,689.40	4,239.00	4,512.02
County	6,412.45	6,566.98	9,468.52
County Road	4,866.85	3,983.55	4,596.76
Highway Imp.	3,500.00	3,500.00	4,000.00
Road Repair	4,000.00	4,000.00	4,500.00
School	12,000.00	12,000.00	13,000.00
One Mill	1,629.00	1,584.37	1,755.00
Bridge	1,500.00	1,500.00	2,000.00
Rejected	29.86	96.43	41.57
School Building	2,000.00		
Township Cont.	2,000.00	2,000.00	2,500.00
Library	200.00		
Total Tax	41,827.56	39,470.33	46,372.87
Tax Paid By C.C.I.Co.	30,104.64	28,656.11	31,546.14
Percentage of Tax Paid by C.C.I.Co.	71.5	71.05	68.15
Assessed Valuation	1,629,000.00	1,584,000.00	1,755,000.00
Tax Rate	2.57	2.52	2.657

11. ACCIDENTS AND PERSONAL INJURY:

We had thirty-nine accidents for the year, which are discussed in detail by the Safety Department. Fortunately, none of them were serious, although in one case in particular, we were very fortunate not to have a fatality, where the contractors returned to their working place and were blasted by a missed hole.

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12. NEW CONSTRUCTION AND PROPOSED CONSTRUCTION:

E. & A. #493:

This E. & A. covered the cost of making changes in the Morris shaft head-frame, installing crusher and new year and motor for the skip hoist. This work was started in August and is still underway. The Worden-Allen Company installed a new dump and butterfly, moving the old dumps up about eight feet. The crusher foundation and a No. 6 crusher, moved from the Holmes Mine, were set up in the fall. The old Morris skip hoist was taken down in December and drum turned end for end. The old double reduction spur gears were replaced by single reduction Herringbone Gears. The 400 H.P. motor was taken out and a new 600 Westinghouse motor installed.

We should cover over both the Morris and Lloyd shaft houses from the landing floor up. This has been done at all the Negaunee mines and eliminates considerable grief in the cold winter months. We have a great deal of trouble at the beginning of the shift thawing ice out of the top tram cars, dumps, dump plates, etc. It sometimes takes 2 to 2½ hours to get things running right after a cold night.

A new 4" water line should be laid from the Lloyd shaft to the location water supply tank. The old 4" wood line is in poor shape. We are constantly repairing leaks. We should lay 4" Universal pipe in six foot lengths. This pipe can be laid quickly and no effort need to be made to keep the trench straight, as the pipe can be run around boulders or ledge.

13. EQUIPMENT:

a. Crushers:

We expect to have the new crusher plant at the Morris shaft operating shortly. Work on this installation was delayed because of the Barnes-Hecker disaster. We used all the timber intended for the pockets underground, for the dams on the 6th level Morris and shipment of new timber has been delayed, as all the mills on the Pacific Coast shut down during December each year for repairs.

The Morris Mine ores have been sized at the Maas Crushing plant, but the jaw crusher installed there does not make as satisfactory a product as we will obtain from the No. 6 crusher we have erected.

d. Scrapers:

We purchased some additional scraper hoists and at the end of the year, this equipment consisted as follows:-

Sullivan,	Air	11
"	Electric	5
Ingersoll,	Air	5
Waugh,	Air	3
"	Electric	2
Total		26

The captain and bosses all prefer the electric type, as they pull a larger load and do it smoothly. An air hoist usually jerks the scraper along as the scraper hits obstructions.

I think the Waugh Electric is to be preferred, because it has ample power, is rugged and simple in construction and will take a 50% overload without trouble.

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13. EQUIPMENT:

d. Scrapers:
(Continued)

We tried out several types of scrapers. The style formerly used was a hoe type with teeth. We experimented with the "Cresent" Double Hoe, Hoe and Box and finally designed a box scraper that suits most of our conditions.

The old box scraper had chains to which to fasten the pulling rope, but we liked to use a bail.

Experiments conducted with ropes, finally proved that the pulling rope should be 1/2" instead of 3/8". We now use 1/2" Plow Steel Seale patent rope for pulling and 3/8" for pull back.

We standardized on 8" Manganese sheaves for head block, with a graphited bronze bushing.

The old boom made of 4" pipe and about 10 feet in length, gave way to a telescopic boom made of 2" pipe, which in turn, was superseded by a pair of tongs similar to ice tongs, for each contract slicing under old subs or a feather and wedge arrangement placed in a drill hole in the breast, where timber sets were lacking.

14. MAINTENANCE AND REPAIRS:

a. Shafts:

Extensive repairs were made to both the Morris and Lloyd shafts. We found the skip roads very wide in gauge and badly worn, particularly in the Morris shaft and new runners and dividings were put in for long distances. The Lloyd shaft still needs repairing below the third level.

b. Electric Tram Equipment:

Our underground haulage system is so extensive that repairs on cars are very heavy. We have to put at least two motor cars through our shops each week to keep this equipment in shape.

Most of the long trams are equipped with 30 lb. rail, purchased during the war. Putting in 30 lb. in place of 40 lb. was a grave mistake as we find it difficult to keep the tracks in shape and the motors and cars are being derailed frequently.

We finally standardized on square springs for motor cars as they are practically unbreakable.

c. Pumping Machinery:

Under this head, was charged the cost of putting in the dams on the 3rd and 4th levels. Although, we felt that there was very little likelihood of the Carp River swamp area ever caving into the Morris Mine, to be doubly safe-guarded, concrete plugs were placed on the 3rd and 4th levels and in three raises leading from the 4th to the 6th levels. These plugs required twelve cars of gravel and three cars of cement. We used a 4 to 1 mixture. These dams cost approximately $7,300.00.

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16. WATER SUPPLY:

As might be expected from the copious rain-fall, we had plenty of water for domestic purposes. In 1925, we employed a pumpman night shift for five months, whereas in 1926, all pumping was done by the cage rider on the day shift. Whenever the supply tank became low, the pump at the shops, taking water from the drainage ditch, brought the supply back to normal. The water from the ditch, leading from old North Lake, was analyzed twice by the bacterioligist at the hospital and found safe and palatable.

17. MINE LOCATION:

We found extensive repairs necessary in the mine location.

The porches were all in poor shape. We found the roofs of the sheds and barns in poor condition. Hardwood floors replaced the old pine floors in the first twenty double houses built in the location. It kept one carpenter busy repairing windows. That work was only two-thirds completed when winter set in. We put asbestos shingles on wherever needed and there are only a few houses left now that are not covered with a fire-proof roof.

The club house was redecorated and provided with some new furniture. The grounds along the boulevard, club house and school were kept in fine shape all year, presenting a very pleasing appearance.

18. NATIONALITY OF EMPLOYEES:

Following is the nationality report for the Morris-Lloyd Mine for the quarter ending December 31st, 1926:

English	24
French	58
Swedish	22
Norwegian	3
Finnish	90
Italian	29
Austrian	1
Irish	1
Greek	1
Hollander	1
Scotch	1
Total	231

19. GENERAL UNDERGROUND OPERATIONS:

The following is a brief resume of mining operations conducted during the year:-

Lloyd East:

This territory employed twelve gangs under the direct supervision of Thomas Tippett. Nine of these gangs have scrapers. Mining was carried on in the main deposit, #8, #10 and #12 deposits.

Main Deposit:

East End:

The territory in the crotch between the main dike and foot at the extreme end of the deposit is mined out one sub below the second main transfer sub.

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19. GENERAL UNDERGROUND OPERATIONS: (Continued)

Lloyd East:

Central Portion:

Five subs were worked out by Nos. 2, 9, 10 and 19 from the 1380 foot elevation down to the 1330 foot sub. The old inclined sliced territory, immediately to the West, pinched out rapidly below the 1360 foot sub and had to be abandoned.

West End:

Contracts Nos. 8 and 46 took out what little ore remained above the second main sub on the main dike. About 50 feet above the 1305 foot elevation, the ore narrowed down to only a drift wide and these contracts were moved to other places.

No. 8 dropped down one sub below the 1305 foot elevation in their raise and drifted West. The ore here is narrow but should widen rapidly as we near the third main sub.

No. 8 Deposit:

This ore area proved a great disappointment. We expected to find the ore running up 150' to the top of old #8 raise. There were two diamond drill holes that showed the ore to go up quite a distance and #8 raise was in ore from the 1165 foot to the 1305 foot elevation. Contract #102 cut out four subs in this raise below the second main sub and found the raise had run up in a small chimney of ore only the size of the raise. We then went over to #17 raise and drifted across to #8 raise in lean ore and discovered that the ore deposit, instead of being 150' heigh, only extended two subs above the 1165 foot elevation. The top sub was worked out and mining the rest of the deposit will have to be delayed until Nos. 10 and 12 deposits are brought down to this same elevation, as the main traveling road runs through the centre of #8 deposit.

No. 10 Deposit:

This chimney of ore runs at various pitches and dips from the third level, clear up to the first main sub, a distance of over 500 feet. At no point is the deposit large enough for two gangs. We are mining under the hanging at two points 200 feet apart. The top portion was worked out from the 1270 foot to the 1240 foot elevation. These subs were very wet and the ore gave us a great deal of trouble. At the lower elevation, West of the mining limit, the deposit is now gone down to the 1045 foot elevation.

No. 12 Deposit:

At the extreme East end Nos. 1 and 100 have carried down mining to the 1290 foot sub. On the West side of the deposit, No. 20 mined out West of their limit to the 1220 foot elevation. Contract #17 branched #10 raise from the third main sub up to the 1290 foot elevation. At that point, we drifted South to diamond drill hole #63, but found the ore narrow. On the 1245 foot sub, #17 extended the old foot-wall drift to the intersection of the Jasper and dike and then raised up 50 feet to the 1290 foot sub to provide #1 with a new raise and avoid one transfer.

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19. GENERAL UNDERGROUND OPERATIONS: (Continued)

Lloyd Mine:

There are very few changes to report from this territory other than six gangs mined ore all year.

Pillars were robbed on the 1040 foot sub. On the 1030 foot sub, the ore was mined along the foot on the West side. On the next sub below, all the ore was taken out of the crotch between the two main dikes and mining at the close of the year, was underway on the 995 foot sub.

On the East side of the ore body, Nos. 7 and 16 took out everything between the 1015 foot and 1030 foot elevation.

On the 995 foot sub, we found the ore to be continuous along the main foot, clear across the entire width of the ore lens. There had always been an area in the centre, where the continuity of the ore was broken for 100 feet, but at the 995 foot elevation, the Jasper disappeared.

Morris Mine:

Excelsior Iron Co.'s Lands:

800 feet South of the Morris shaft, the ore was mined out from the third level to the 840 foot sub, West of old #31 raise. On the West end, a new raise, coming up from the 4th level, was holed midway in the deposit. On the 4th level, a new cross-cut was driven West from the North and South main drift, close to the 3200' East and West meredian, to provide room for the new raise mentioned before.

East Deposit:

The main East deposit was mined out to within two subs of the fourth level. A portion of this ore lens projects over on Chase Lease No. 9.

Sixth Level Deposits:

On the sixth level, three main level drifts were driven to outline the ore found in diamond drill holes Nos. 100 and 101. The North drift was driven East along the 3400' meredian, while the other two parallelled each other 150 feet further South. From these drifts, four raises were put up and exploring done by sub level drifts. We found the ore in the North drift to extend up and join the main #21 deposit at the 430 foot elevation. The ore in the South drift is undoubtedly a portion of the main #33 deposit, coming up from the 7th level. The raises above the 6th level, prove the top to be up about 60 feet above the sill floor.

Main #33 Deposit:

Contract #63 raised from the 7th to the 6th levels. The raise was placed close to the hanging 125 feet East of the dividing line between the Excelsior Iron Co.'s Lands and Chase Lease No. 9. Halfway between the two levels, an exploring sub was driven across the formation. This work proved the ore body to be narrow for the top 200 feet.

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19. GENERAL UNDERGROUND OPERATIONS: (Continued)

Morris Mine:

Chase Lease No. 9:

No. 24 Sub Stope:

Production from this stope shows a big decrease for the year.

Year	Tons	Percentage of Total Product
1923	68,359	27.0
1924	66,019	26.8
1925	59,243	22.3
1926	29,968	10.3

Four years ago, this stope was a big factor in the total production from the mine, in fact was all that kept costs down and tons per man up. The introduction of scrapers, however, changed conditions so that there was no material advantage in operating the sub stope, particularly when you consider that the bulk of the product secured here for two years past, was Morrisville. We stopped drawing from the chutes last spring and all work in this ore has been abandoned, due to sealing off the top of the traveling road with a concrete plug.

On the West side of the stope, contracts Nos. 29 and 38 finished mining the off-shoot from the main stope.

South of the sub stope, the main 6th level drift was extended South-west and two cross-cuts driven East and West. The North cross-cut was carried clear through for 250 feet South of the dike, which forms the hanging of the sub stope ore body at the 6th level. The second cross-cut was only extended in 90 feet. These drifts were driven from information shown by diamond drill hole #33 and from the fact that a short distance below the 6th level, an exploring cross-cut from #61 raise, showed ore South of the dike. Raises put up from these drifts, prove the ore to extend only a short distance above the 6th level.

Above the 7th level, contract #75 mining down along the hanging in the continuation of the sub stope ore body, had mined the ore down to the 210 foot sub.

East Deposit:

On the main 6th level, we tried to prove up the ore in diamond drill hole #56, but found that this ore probably pinches out just below the 6th level.

On the East side of this deposit, #32 drove a new main level drift and started a new raise after exploring this ore lens 100 feet above the 6th level. We plan to take the ore from the 5th level down, leaving the top 200 feet to support the concrete plug placed in the old raise running up through the entire deposit from the 6th to the 4th level.

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19. GENERAL UNDERGROUND OPERATIONS: (Continued)

Morris Mine:

Chase Lease No. 24:

No. 62 Deposit:

This is otherwise known as the Trench Stope deposit, but is split into four sections.

In the central or trench stope area, Nos. 90 and 91 worked out seven tiers down to the 180 foot elevation, eight tiers above the 7th level.

Contract #92 mining South of the trench, took out the ore down to the 215 foot elevation.

Contract #62 spent the entire year raising and driving development drifts. We finally decided to abandon trying to connect up the three apparently separate lenses found on the 215 foot sub, as the dikes between the ore areas, vary in pitch and direction.

No. 62 put up their main raise to the top of the ore just North-east of the trench and will start mining at the 280 foot elevation.

Contract #76, North-west of the trench in another portion of the same deposit, mined down to the 200 foot sub.

No. 63 Deposit:

Contract #63 mined pillars left in the old shrinkage stope. There is still some ore left here on the extreme East end of the old stope.

Chase Lease No. 25:

The only deposit on this lease in which we did any mining, was #74 on the extreme West end of the lease. Three contracts Nos. 70, 71 and 72 took out most of the ore on both sides of the dike separating the two lenses. The West deposit is mined down to the level. On the East side, the ore is gone down to a point 40 feet above the sill floor.

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ANALYSIS OF COST SHEETS, EXPLAINING INCREASE OR DECREASE IN VARIOUS ACCOUNTS BETWEEN THE YEAR 1925 AND 1926

UNDERGROUND COSTS

ACCOUNT
DEVELOPMENT IN ROCK

Year 1926	$9,626.79
" 1925	5,924.47
Increase	$3,702.32

Footage driven in Rock 1926	- 1439
" " " " 1925	- 800
Increase for 1926	- 639

Cost Per Foot in 1926	$6.69
" " " " 1925	7.35
Decrease for 1926	$ .66

Although the total cost increased, it is less in proportion to the additional footage driven. It will be noted that the unit cost per foot, therefore, shows a decrease.

ACCOUNT
DEVELOPMENT IN ORE

Year 1926	$12,985.67
" 1925	16,486.80
Decrease	$ 3,501.13

The total for the year 1926 would have been at least $2,000.00 greater if the Morris shaft workings had not been shut down on November 3rd.

Year	Ore Drifting	Ore Raising	Total
1926	2,249 Ft.	1,703 Ft.	3,952 Ft.
1925	2,794 "	1,288 "	4,082 "
Difference	545 Ft.	415 Ft.	130 Ft.

The total footage of drifts and raises in ore in 1926 shows a small decrease, whereas, the total expenditure shows a large decrease for 1926. Therefore, the unit cost per foot was considerably less in 1926 due to better efficiency. We used scrapers to some extent in driving sub level drifts.

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UNDERGROUND COSTS

ACCOUNT
STOPING

Year 1926	$129,348.83	Cost Per Ton	.446
" 1925	116,148.71	" " "	.437
Increase	$ 13,200.12	" " "	.009

The total labor cost for 1926 increased $7,467.00 over 1925 due to opening up new territory above the 6th and 7th levels Morris Mine. For the first six months of 1925, we had a total of approximately 66 miners stoping and developing. In the latter part of 1926, this had increased to 74. Of these men, 34 gangs were stoping compared with 27 in 1925. Although this increased the stoping cost, the additional product spread over the other accounts, decreased the total cost per ton.

We charged out during 1926, 7 new scraper hoists, most of them being electrics.

ACCOUNT
TIMBERING

Year 1926	$66,140.31	Cost Per Ton	.228
" 1925	60,466.98	" " "	.227
Increase	$ 5,673.33	" " "	.001

Although the total cost shows an increase, the unit cost shows practically no change. We used more timber per ton of ore due to the fact that for four or five years back, a considerable portion of the product came from #24 sub stope. This stope was stopped early in 1926 and all of our ore won by the sub level slicing method. It is obvious that our consumption of timber must show an increase. Any saving in the timbering cost, had to come from the labor involved in handling it and the unit cost shows no perceptible increase due to less expense getting the timber from surface to the working place.

ACCOUNT
TRAMMING

Year 1926	$43,806.50	Cost Per Ton	.151
" 1925	42,725.63	" " "	.161
Increase	$ 1,080.87	Decrease	.010

The tramming cost shows a small increase due to operating night shift motor crew on the seventh level all of 1926, whereas in 1925, this change was not made until July. The unit cost, however, is decreased due to larger tonnage handled.

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UNDERGROUND COSTS

ACCOUNT
VENTILATION

Year 1926	$680.47
" 1925	604.08
Increase	$ 76.39

Cost increased due to purchasing several lengths of ventube.

ACCOUNT
PUMPING

Year 1926	$15,078.18
" 1925	13,958.88
Increase	$ 1,119.30

The increased charges for 1926 are entirely due to the additional amount of electric power used in pumping water. The gallons pumped in 1926 totalled 205,247,760 compared with 172,168,518 gallons in 1925. The increase was due to the unusually heavy precepitation in August and September.

ACCOUNT
COMPRESSORS
AND AIR PIPES

Year 1926	$22,410.82
" 1925	23,974.51
Decrease	$ 1,563.69

Decrease is due to not operating Morris shaft workings after November 3rd.

ACCOUNT
UNDERGROUND
SUPERINTENDENCE

Year 1926	$13,886.09
" 1925	13,238.74
Increase	$ 647.35

Increase due to mine foreman being paid higher wages in 1926 and also due to the fact that additional supervision was provided in the Morris shaft.

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MAINTENANCE COSTS

ACCOUNT
COMPRESSORS AND
POWER DRILLS

Year 1926	$924.67
" 1925	514.27
Increase	$410.40

Our drilling equipment was increased by adding five new R.B.12 machines at a cost of $170.00 each.

ACCOUNT
HAND TRAM EQUIPMENT

Year 1926	$250.79
" 1925	831.60
Decrease	$580.81

Cost for 1926 shows a large decrease due to the substitution of scrapers for cars in the sub levels.

ACCOUNT
ELECTRIC TRAM EQUIPMENT

Year 1926	$15,141.84
" 1925	17,727.13
Decrease	$ 2,585.29

The above accounts are sub-divided as follows:-

	1925	1926
Generator & Dynamo	$ 101.76	$ 6.20
Locomotives	3,914.34	3,175.28
Wiring	1,254.86	962.80
Main Line Tracks	2,749.40	3,347.91
" " Cars	9,706.77	7,649.65
Total	$17,727.13	$15,141.84

Repairs on locomotives not as heavy as year before and only six new cars were purchased and charged out in 1926. These six cars were salvaged from the Francis Mine.

Increased expense on main line tracks is due to the use of 30 Lb. rail. This rail is beginning to give a lot of trouble and will eventually have to be replaced with 40 Lb.

ACCOUNT
PUMPING MACHINERY

Year 1926	$7,770.01
" 1925	4,064.73
Increase	$3,705.28

The cost of building the concrete bulk-heads on the 3rd and 4th levels Morris Mine was charged to this account. This account, but for those concrete dams, would have shown a large decrease as the total expended to Nov. 1st was only $452.92. The balance of the $7,770.01 cost was due to the dams.

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SURFACE COSTS

ACCOUNT
HOISTING

Year 1926	$18,333.79	Cost Per Tons	.063
" 1925	17,141.86	" " "	.065
Increase	$ 1,191.93	Decrease	.002

Cost increased due to hoisting larger tonnage. Unit cost, however, shows a slight decrease.

ACCOUNT
STOCKING ORE

Year 1926	$11,646.64
" 1925	11,336.34
Increase	$ 310.30

Small increase due to stocking more ore in 1926. Tonnage stocked in 1926 was much greater than in 1925 as our product was larger and shipments smaller. The balance on hand increased from 324,188 tons to 349,872 in 1925 and jumped from the latter figure to 415,259 tons at the end of the year 1926.

ACCOUNT
SCREENING AND CRUSHING

Year 1926	$1,575.61
" 1925	2,202.95
Decrease	$ 627.34

There were no unusual expenses in connection with this account. The biggest item is fuel used to keep the frost and ice out of the equipment in the cold months.

ACCOUNT
DRY HOUSE

Year 1926	$9,147.53
" 1925	9,622.69
Decrease	$ 475.16

The largest expense in maintaining the dry is fuel. The cost of supplying water to the dry for the past year was less than formerly because no pumpman was employed night shift at the water supply pump. We also had taken up all the depreciation on the water supply system in 1925. Some additional fuel was burned in 1926 but this cost was more than offset by the other two items.

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SURFACE COSTS

ACCOUNT
GENERAL SURFACE EXPENSE

Year 1926	$5,355.40
" 1925	4,913.68
Increase	$ 441.72

Increased cost due to more labor employed looking after surface grounds. Because of the copious rain-fall, the planted areas developed weeds very fast and it required more labor than usual to keep the grounds looking neat.

ACCOUNT
HOISTING EQUIPMENT

Year 1926	$6,049.46
" 1925	4,954.11
Increase	$1,095.35

Increase is due to extensive repairs to skip roads installing new runners. We also rebuilt one cage, put new cage in Lloyd shaft and put into use, two new skips.

ACCOUNT
SHAFT

Year 1926	$2,543.84
" 1925	4,765.78
Decrease	$2,221.94

Cost for 1925 larger than normal due to installing new doors and air lifts at all shaft pockets.

ACCOUNT
TOP TRAM EQUIPMENT

Year 1926	$2,750.47
"	2,630.77
Increase	$ 119.70

There were no unusual items of cost for this account in 1926. The biggest expense is for wire rope and repairs to the electric equipment. We had one top tram motor burn out at the Lloyd shaft.

ACCOUNT
DOCKS, TRESTLES
AND POCKETS

Year 1926	$ 437.16
" 1925	1,484.36
Decrease	$1,047.20

Repairing planking on permanent trestles at both shafts in 1925 accounts for the decrease.

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SURFACE COSTS

ACCOUNT
MINE BUILDINGS

Year 1926	$1598.57
" 1925	1194.11
Increase	$ 404.46

The Lloyd shaft house superstructure, crusher building and tunnel were gunited in 1926.

GENERAL MINE ACCOUNTS

ACCOUNT
INSURANCE

Year 1926	$150.40
" 1925	126.24
Increase	$ 24.16

Increased premiums in 1926.

ACCOUNT
ENGINEERING

Year 1926	$3,293.02
" 1925	3,629.02
Decrease	$ 336.00

Less engineering supervision in 1926.

ACCOUNT
ANALYSIS

Year 1926	$8,504.42
" 1925	7,435.17
Increase	$1,069.25

All of the laboratory expense for November and December was charged to the Morris-Lloyd Mine. Previous to Nov. 3rd, a proportion was borne by the Barnes-Hecker Mine.

ACCOUNT
PERSONAL INJURY EXPENSE

Year 1926	$3,489.10
" 1925	8,738.95
Decrease	$5,249.85

Cost for 1925 greater because of a fatality and also due to a $1,350.00 payment for loss of an eye to an employee.

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GENERAL MINE ACCOUNTS

ACCOUNT
SAFETY DEPARTMENT EXPENSE

Year 1926	$255.13
" 1925	220.33
Increase	$ 34.80

Small increase due to cost of first aid supplies.

ACCOUNT
TELEPHONES AND
SAFETY DEVICES

Year 1926	$980.98
" 1925	793.87
Increase	$187.11

Increase due to purchasing new underground telephones and installing same.

ACCOUNT
LOCAL GENERAL WELFARE

Year 1926	$3,281.87
" 1925	2,663.09
Increase	$ 618.78

These items come from Mr. Moulton's department and are undoubtedly explained in his report.

ACCOUNT
MINE OFFICE

Year 1926	$11,997.85
" 1925	11,890.49
Increase	$ 107.36

Small increase due to more auto mileage.

BARNES-HECKER MINE

ANNUAL REPORT

YEAR 1926

1. GENERAL:

The Barnes-Hecker Mine operated five double shifts a week until November 3rd when the disastrous cave-in occurred, completely wrecking the mine and taking the lives of 51 men. The past year had been the best as regards production, shipments, tons per man and costs. The quality of the ore hoisted was also improving and the tonnage developed underground in 1926, was very encouraging. The report in detail follows:-

2. PRODUCTION & SHIPMENTS:

a. Production by Grades:

	Total Tons	Barnes Ore	% of Total	Silica Ore	% of Total
Year 1923	36,228	23,742	65.4	12,486	34.5
" 1924	75,857	58,123	76.7	17,734	23.5
" 1925	138,582	106,905	77.2	31,677	22.8
" 1926	163,380	133,383	81.7	29,997	18.3

The grade of the product produced during the past year improved as is evident from the small production of Siliceous material hoisted as the quality of the ore body was improving with depth.

b. Shipments:

Shipments showed a marked increase over previous years, the total forwarded being 182,668 tons. As in 1925, 20% of the Cliffs Group mixture was Barnes ore, but we also shipped straight Barnes ore to Charcoal furnaces besides a sale made to the Thomas Furnace Company. The company also moved 11,958 tons of Barnes Silica.

The iron content in the 1926 shipments averaged 58.20 for the Barnes grade.

Destination	Barnes Ore Tons	Silica Ore Tons	Total Tons
L. S. & I. Dock, Marquette	136,606	8,523	145,129
C. & N. W. Dock, Escanaba	14,925		14,925
Pioneer Furnace, Marquette	11,972	462	12,434
Mitchell Diggins, Cadillac	5,986	1,654	7,640
Delta Chemical Co., Wells	339	744	1,083
Antrim Iron Co.	243		243
Charcoal Iron Co.		575	575
Lost in Transit	9		9
Total	170,080	11,958	182,038

c. Stockpile Balances At End Of Year:

	Barnes Ore	Silica Ore	Total
Year 1923, Dec. 31st.	37,576	2,159	39,735
" 1924, " "	95,699	2,793	98,492
" 1925, " "	84,553	28,023	112,576
" 1926, " "	47,856	46,062	93,918

BARNES-HECKER MINE
ANNUAL REPORT
YEAR 1926

2. PRODUCTION & SHIPMENTS: (Continued)

f. Ore Statement:

	Barnes	Barnes Silica	Total	Total Last Year
On Hand Jan.1,1926	84,553	28,023	112,576	98,492
Output for Year	133,390	29,990	163,380	138,582
Total	217,936	58,020	275,956	237,074
Shipments	170,080	11,958	182,038	124,498
Balance on Hand	47,856	46,062	93,918	112,576
Increase in Output			24,798	
Decrease in Ore on Hand			18,658	

1926 -- 2-8 Hour shifts, 5 days per week, Jan. 1st to Nov. 3rd, 1926. Idle Nov. 3rd to Dec. 31st account Cave-In.
1925 -- 2-8 Hour shifts, 6 days per week, Jan. 1st to Aug. 31st 2-8 Hour shifts, 5 days per week, Aug. 31st to Dec. 31st

g. Delays:

Date	Cause of Delay	Loss in Product
Feb. 9th	3¼ Hrs. Top Tram Car Over Dump	150 Tons
" 11th	8 Hrs. " " " " "	300 "
" 16th & 17th	3 Shifts because of fire	1,000 "
Mar. 8th	2 Shifts because of storm	650 "
Apr. 26th	2 Hrs. No current	100 "
Nov. 3rd - Dec. 31st	No production due to cave-in	30,000 "
	Total	32,200 Tons

3. ANALYSIS:

a. Average Mine Analysis on Output for 1926:

Grade	Iron	Phos	Silica
Barnes	58.15	.083	7.52
Barnes Silica	53.16	.084	14.90

b. Average Analysis on Straight Cargoes for 1926:

	Mine			Lake Erie	
Grade	Iron	Phos	Silica	Iron	Moist.
Barnes	58.12	.078	7.99	57.57	12.60
Silica			All Mixed		

c. Average Mine Analysis on All Ore Shipped:

Grade	Iron	Phos	Silica
Barnes	58.20	.082	7.67
Barnes Silica	53.70	.080	13.96

4. ORE RESERVES:

No estimate of the ore left in the mine was made for this report but considerable new tonnage of Barnes ore was being developed on the 630 foot sub, a short distance above the third level, since July. I have no doubt but that the estimate would have shown as much new ore developed as we mined during the year.

BARNES-HECKER MINE
ANNUAL REPORT
YEAR 1926

5. LABOR & WAGES:

a. Coments:

We had very little trouble keeping our organization up to normal. There usually is a shortage of labor in July and November, the former because of the farmers getting in their hay and the latter during the hunting season.

b. Comparative Statement of Wages and Product:

	1926	1925	Increase	Decrease
Product	163,380	138,582	24,798	
No. of Shifts & Hours	2-8	2-8		

Average Number of Men Employed:

Surface	24	27		3
Underground	90	87	3	
Total	114	114		

Average Wages Per Day:

Surface	4.27	4.33		.06
Underground	4.99	4.98	.01	
Total	4.83	4.82	.01	

Average Wages Per Month of 25 Days:

Surface	106.75	108.25		1.50
Underground	124.75	124.50	.25	
Total	120.75	120.50	.25	

Tons Per Man Per Day:

Surface	25.56	17.29	8.27	
Underground	7.44	5.50	1.94	
Total	5.76	4.17	1.59	

Labor Cost Per Ton:

Surface	.167	.250		.083
Underground	.671	.906		.235
Total	.838	1.156		.318

Average Product Stoping & Tramming	11.57	11.69		.08
" Wages Contract Miners	5.42	5.76		.34

Number of days Labor Statement:

Surface	6456½	8012¼		1555¾
Underground	21960½	25184¾		3224¼
Total	28417	33197		4780

Amount for Labor:

Surface	27558.65	34688.57		7129.92
Underground	109673.97	125538.19		15864.22
Total	137232.62	160226.76		22994.14

BARNES-HECKER MINE
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6. SURFACE:

a. Buildings:

The dry roof was given a coat of tar paint and patched where necessary.

The top tram building which caught fire on February 16th, was rebuilt. The fire started at 6:15 A.M. and evidently caught from a cigarette thrown carelessly on the floor. The old building was of a wooden construction and was all afire before the dryman noticed it. The fire was kept from spreading and by the night shift of the next day, we had rebuilt the building and installed a new top tram engine. The new building was lined with galvanized sheeting. The outside walls were covered with expanded metal and gunited.

b. Trestles:

The Silica trestle was extended further to the South. The main single leg stocking trestle had to be torn down and rebuilt near the shaft. The first eight bents were pulled out of line. There is no economy in erecting a single leg wooden trestle for stocking soft hematite, as it is impossible to keep the track lined up even with heavy guy lines because the legs shear off.

c. Tracks:

A survey was made for a new timber unloading track located on top the bank between the mine buildings and the main line. The track itself, however, was not constructed.

7. UNDERGROUND:

a. General:

We developed quite a tonnage of new ore during the year. The two new subs opened at the East end, half-way between the first and second levels and the 630 foot sub above the third level, proved the ore reserves to be greater than previously estimated. Following is a detailed description of the work done at each elevation.

First Level:

East End:

Six subs were mined by contracts Nos. 2, 8, 9, 12 and 15, tributary to the 1060 foot sub and raises Nos. 8 and 29. All of these subs ran up against Jasper along the 7600 foot meredian, which became the mining limit between them and No. 11 contract to the East.

This ore body petered out very fast although a small stringer probably went down to the first level 90 feet below.

Contract No. 11 mined two subs between old No. 10 workings and No. 29 raise.

At the West end of the East deposit, No. 4 and No. 13 took out all the ore down to within 15 feet of the back of the first level.

West End:

Four subs were mined out, two above the first level and two below in the area bounded by Nos. 1, 2, 3, 4 and 14 raises. Four gangs were employed at the beginning of the year which dwindled to two at the time of the disaster. It was one of these two gangs on the 945 foot sub that undoubtedly holed into the vug which caused the mine to fill with sand and water.

BARNES-HECKER MINE
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7. UNDERGROUND:
(Continued)

a. Second Level:

East End:

A new sub level at the 890 foot elevation half-way between the first and second levels was opened up to find out the extent and quality of the ore body. A new raise #41, 60 feet East of #40 was first put through from the second to the first level.

The sub proved up an ore area 350 feet long and 150 feet wide opposite #41 raise. The ore, however, was mostly mixed. A seam of good ore 30 to 40 feet wide followed the dike on the South contact.

Central Portion:

In the central area of the main deposit, between #33 and #36 raises, three contracts mined out the ore for 50 feet vertically. The top sub mined in January, showed a width of ore of 70 feet. The bottom sub, close to the second level, proved the ore for 100 feet in width. The quality also improved as the new subs went deeper.

West End:

Contracts Nos. 30 and 31 took out two subs below the first level. The ore here was improving with depth.

Main Level:

Contract #8 started a drift North-east of #40 raise, North of the dike. The purpose of this drift was to provide a transfer for two new raises required to take out the extreme West end of the East deposit below the first level.

Third Level:

All of the mining done between the second and third levels was in the nature of exploratory work as we were anxious to know the extent and quality of the ore lenses close to the main third level. With that end in view, three new raises were holed from the third to the second levels and the ore outlined at the 630 foot elevation, extending the drifts on the old sub level. At the time of the disaster, we had proven the main deposit to be 500 feet long and at least 150 feet wide at the East end. Most of the new ore developed was of Barnes grade.

On the main level itself, we were exploring the ore on the South side of the main drift between #74 and #77 raises.

b. Development:

Extensive development work was carried on at the 890 foot elevation half-way between the first and second levels in the East end of the mine. The sub level proved up an area 150 feet wide and 350 feet long, but with the exception of a narrow strip of good ore 30' to 40' wide along the South contact, the ore body was mixed with seams of Siliceous material.

At the 630 foot elevation, 70 feet above the third level, the new sub opened up from three new raises, showed an ore area over 500 feet long and as much as 150 feet wide. The cross-cuts showed the ore to be mostly Barnes grade, very little Siliceous material being encountered.

This was also considerable more raising done in 1926 than in the previous year and a short rock drift was driven this past year.

Raising and Rock Drifting

	1925	1926
Ore and Rock Raises	307'	783'
Rock Drifting	0'	74'

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7. UNDERGROUND:
(Continued)

c. Stoping:

We added a few more scraper hoists to our equipment and our tons per man stoping naturally showed a healthy increase.

Tons	Per	Man	Stoping	1923	was	9.33
"	"	"	"	1924	"	8.36
"	"	"	"	1925	"	11.65
"	"	"	"	1926	"	16.90

The cost per ton for stoping was .553 in 1924; .568 in 1925 and only .400 in 1926. The reduction in cost is entirely due to the increased tons per miner.

Statement of Explosives Used For Breaking Ore:

Kind	Amount 1924	Amount 1925	Amount 1926
40% 1¼" L.F. Extra	4,910.62	6,601.50	6,866.50
60% 1¼" Amm. Gelatin	0	0	121.25
Total Powder	4,910.62	6,601.50	6,987.75
Fuse	947.88	1,237.20	1,223.41
Caps	327.07	419.59	388.74
Tamping Bags	0	8.90	4.83
Cap Crimpers	11.13	6.68	5.45
Total Fuse Etc.	1,286.08	1,672.37	1,622.43
Total Explosives	6,196.70	8,273.87	8,610.18
Product	75,857	138,582	163,380
Lbs. Powder Per Ton of Ore	.479	.353	.324
Cost Per Ton For Powder	.065	.0477	.0428
" " " " Fuse	.017	.0120	.009
" " " All Explosives	.082	.0598	.0527
Avg. Price Per Lb. For Powder	.135	.135	.132

It will be noted that the pounds of powder per ton of ore dropped from .353 to .324 in a year and from .479 to .328 in two years.

d. Timbering:

Before the introduction of the scrapers, it was customary to charge the cost of lagging down the subs to timbering. During the past year, this work was considered part of the miners contract and the contractor was not paid company account wages when covering down. As a result of this expense being charged to stoping, the cost per ton for timbering shows a decrease of 30%, compared with last year.

Timber Consumption:

	1924	1925	1926
Lin. Ft. 6" to 8"	33,414	48,625	54,665
" " 8" to 10"	59,870	81,775	62,198
" " 10" to 12"	12,012	19,290	22,032
" " 12" to 14"	4,696	1,392	2,432
" " 14" to 16"	1,572	0	0
Total Timber	111,564	151,082	141,327
Lin. Ft. 5' Lagging	440,937	527,000	420,750
" " 8' "	87,916	195,000	123,880
Total Lagging	528,853	722,100	544,630
Poles	194,820	267,240	247,940
Total Lagging & Poles	723,673	989,340	792,570
Covering Boards	5,417	6,200	4,800
Product	75,857	138,582	163,380

BARNES-HECKER MINE
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YEAR 1926

7. UNDERGROUND:
(Continued)

d. Timbering:
(Continued)

	1924	1925	1926
Ft. Timber Per Ton of Ore	1.471	1.090	.865
Ft. Lagging " " " "	6.971	5.210	3.334
Ft. " " Ft. " Timber	4.74	4.779	3.855
Cost Per Ton For All Timber	.181	.1372	.0962
Equivalent of Stull Timber To Board Measure	182,020	215,917	209,292
Ft. Board Measure Per Ton of Ore	2.399	1.558	1.281

The cost per ton for timber has been cut in half in two years, showing a drop of one-third since last year.

k. Tramming:
The total expended for tramming is larger than last year due to transferring ore on the 1060 foot sub in the East end, above the first level. One gang of trammers was employed here both day and night shift, tramming the ore from Nos. 8, 9 and 12 raises to #29 raise. We also employed a skip tender on the second level all the time and on the third level part time.

l. Pumping:
The pumping expense was above normal due to the main crank shaft breaking on the Aldrich pump. Ordinarily, it costs us about $2500 monthly to handle the water with the triplex pump, but when the breakdown occurred and the centrifugal was operated, our monthly expense doubled.

Pumping Expense:

Jan. 1926	$2,492.41
Feb. "	2,390.93
Mar. "	2,481.31
Apr. "	2,798.36
May. "	4,601.41
Jun. "	5,213.18
Jul. "	5,026.52
Aug. "	3,587.72
Sep. "	2,148.82
Oct. "	2,249.34

The triplex pump went out of commission in April and did not operate again until August. The above table shows conclusively that it is not advisable to pump water with centrifugal pumps under high heads.

The following table shows the water pumped from the mine up to the time of the disaster.

	Gallons Per Minute
Year 1920	261
" 1921	1113
" 1922	1044
" 1923	743
" 1924	615
" 1925	713
" 1926	665

The year 1926 was marked by heavy precipitation but despite that, the flow of water decreased in the mine.

BARNES-HECKER MINE
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7. UNDERGROUND:
(Continued)

m. Electric Tram Equipment:

Six new four ton rotary dump motor cars were added to the underground equipment during the year. These cars were purchased from the Lake Shore Engine Works at a cost of $295.00 each.

8. COST OF OPERATING:

a. Total Cost of Production:

Year	Labor	Supplies	Total
1923	2.258	2.331	4.589
1924	1.641	1.109	2.750
1925	1.177	.797	1.974
1926	.863	.587	1.450

b. Detail of Costs:

	1925	1926	Increase	Decrease
Total Underground Costs	1.703	1.232		.471
" Surface "	.157	.120		.037
General Mine Accounts	.114	.098		.016
Cost of Production	1.974	1.454		.524
Plant Account	1.001	1.000		.001
Taxes	.051	.049		.002
Central Office	.104	.083		.021
Contingent Expense	.081	.038		.043
Cost Adjustment	.024	.009		.015
Total Cost on Stockpile	3.235	2.629		.606
Loading and Shipping	.039	.045	.006	
Total Cost on Cars	3.274	2.674		.600

10. TAXES:

The Barnes-Hecker and Morris shaft workings are in Ely Township and the following table shows the taxes raised in that township for the past four years.

Ely Township Taxes:

Tax	1923	1924	1925	1926
State	4,257.67	3,689.40	4,239.00	4,512.02
County	7,210.89	6,412.45	6,566.98	9,468.52
County Road	4,651.14	4,866.85	3,983.55	4,596.76
Highway Imp.	3,500.00	3,500.00	3,500.00	4,000.00
Road Repair	4,000.00	4,000.00	4,000.00	4,500.00
School	12,000.00	12,000.00	12,000.00	13,000.00
One Mill	1,552.51	1,629.00	1,584.37	1,755.00
Bridge	1,000.00	1,500.00	1,500.00	2,000.00
Rejected	52.14	29.86	96.43	40.57
School Building		2,000.00		
Township Contingent	2,000.00	2,000.00	2,000.00	2,500.00
Library		200.00		
Total Tax	40,224.35	41,827.56	39,470.33	46,372.87
Tax Paid by C.C.I.Co.	25,601.87	30,104.64	28,656.11	31,546.14
Percentage of Tax Paid by C.C.I.Co.	62.6	71.5	71.05	68.03
Assessed Valuation	1,553,000	1,629,000	1,584,000	1,755,000
Tax Rate	2.59	2.57	2.52	2.657