NORTH LAKE DISTRICT

MORRIS LLOYD MINE

GENERAL

This year was very satisfactory for the North Lake District. Better operating results were secured than ever before, the tons per man per day showing a large increase over previous years and the costs of production and cost on cars for both properties were the lowest ever attained. The miners in all shafts made better wages and I believe as a result, there was better feeling on the part of the employees and it was not so difficult to hold men, particularly at the Barnes-Hecker property. Shipments for the district exceeded those of any previous year but the way production is increasing, we hope the sales department will be successful in disposing of at least 500,000 tons of our ore in 1926. Our output at the close of the year was running at the rate of approximately 40,000 tons a month, an increase of 25% over the normal monthly production at the first of the year. This increased output was obtained with practically the same number of mining gangs, there being (49) forty-nine gangs employed in the district in January 1925 compared with (51) fifty-one in December 1925.

The detailed report now follows being divided into two parts, the first dealing with the Morris-Lloyd Mine, the Barnes-Hecker being taken up last.

PRODUCTION

The production of ore from the Morris-Lloyd Mine was 265,829 tons for 1925, a large increase over the previous year. Furthermore, the figures for 1924 included 19,186 tons of stockpile over-run. No over-runs on stockpiles were taken up in 1925.

Ore was hoisted for 260 days, an average of 1023 tons per day, which is by far the greatest daily average for single shifts since the mine was opened up. We exceeded the estimated production by 73 tons per day.

MORRIS LLOYD MINE

PRODUCTION
(CONTINUED)

The following table shows the total production for the past few years:-

	MORRIS	SILICA	LLOYD	LLOYDDALE	TOTAL
YEAR 1925	100,568	59,945	105,316		265,829
" 1924	76,038	69,253	88,672	12,393	246,356
" 1923	132,413	25,147	101,145	1,630	260,335
" 1922	109,227	22,850	89,902		221,979
" 1921	68,593	45,529	84,741	171	209,034
" 1920	47,572	63,873	105,327	45,000	261,772

In 1920 these mines were operated 300 days and did not produce as much ore as we did in 1925 working but 260 days.

Notwithstanding the large output, we had more ore in sight at the close of the year than in the beginning. In fact, we show the largest ore reserves in the mines history.

SHIPMENTS

Shipments from the Morris-Lloyd shafts were a disappointment as we forwarded less than last year. This was due to substituting Lake Ore in the Stephenson mixture for our Lloyd Ore.

We certainly hope that the sales for 1926 can be materially increased, especially the Lloyd high phos. ore, as shipments for 1925 from the pocket were only 3½% of the total hoisted for that grade.

We have forwarded quite a tonnage to Charcoal Furnaces, the total being 123,276 tons for the year.

The statement that follows shows the shipments by grades for the past and previous years.

MORRIS LLOYD MINE

SHIPMENTS

YEAR	1919	1920	1921	1922	1923	1924	1925
GRADES	TONS	TONS	TONS	TONS	TONS	TONS	TONS
Morris Ore,	3,613	37,402	7,868	118,858	45,394	27,084	122,435
Lloyd Ore,	121,198	111,922	38,582	96,571	80,267	104,115	67,953
Lloyddale Ore,	27,699	11,438		42,742	20,390	25,171	
TOTAL NON BESSEMER,	152,510	160,762	46,450	258,171	146,051	156,370	190,388
Morris Bessemer,	5,000	7,789					
TOTAL BESSEMER,	5,000	7,789					
Morrisville,	8,506	256	4,620	8,117	39,773	80,975	28,673
Lloyd Silica,	24,541	31,581	14,780	27,627	24,868	31,883	21,084
TOTAL SILICA,	33,047	31,837	19,400	35,744	64,641	112,858	49,757
GRAND TOTAL,	190,557	200,388	65,850	293,915	210,692	269,228	240,145

The following table shows the various ores shipped and their destination for last year:-

DESTINATION	GRADE				
	LLOYD	MORRIS	LLOYD SILICA	MORRISVILLE	TOTAL
Presque Isle Dock	19,051	61,392	89	28,673	109,205
C.&.N.W. Escanaba Dock	3,549	4,064			7,613
Marquette Furnace	23,623	23,045	4,045		50,713
Antrim Iron Company	5,945	16,047	1,317		23,309
Cadillac Furnace	15,785	17,887	10,412		44,084
Wells "			4,754		4,754
East Jordan "			465		465
TOTAL	67,953	122,435	21,084	28,673	240,145

STOCKPILE BALANCES

The ore in stock at the close of the year exceeded the previous years balance and with production running about 25,000 tons monthly at the close of the year, we are going to be up against it for stocking room unless there is a healthy increase in sales and shipments in 1926. Shipments for the coming year should be doubled to leave us in fair shape at all three producing shafts in this district.

A table follows showing the ore in stock at the Morris-Lloyd shafts, Viz:-

MORRIS LLOYD MINE

STOCKPILE BALANCES AS OF DECEMBER 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

DELAYS

We suffered no delays during the entire year that cut down our production. On October 19th, no current was available due to trouble on the transmission line because of the previous nights sleet storm, but we operated Saturday the 24th instead.

ORE ESTIMATES

Following is an estimate of the ore in sight on December 31st, 1925, making the usual deductions of 10% and 10% for rock and loss in mining.

MORRIS MINE

LOCATION OF ORE	BESSEMER ORE	MORRIS ORE	TOTAL TONS
DEVELOPED ORE			
Above 4th Lev. (Chase Lease #9)		5,001	5,001
" " " (C.C.I.Co. Land)		62,057	62,057
" 6th " (Chase Lease #9)		187,028	187,028
" " " (Chase Lease #26)		2,339	2,339
" " " (C.C.I.Co. Land)		133,781	133,781
" 7th " (Chase Lease #9)	38,921	647,800	686,721
" " " (Chase Lease #24)		115,895	115,895
" " " (Chase Lease #25)		34,762	34,762
" " " (Chase Lease #26)		22,174	22,174
" " " (C.C.I.Co. Land)	35,464	106,392	141,856
Below " " (Chase Lease #9)	22,609	94,701	117,310
" " " (Chase Lease #24)		18,394	18,394
" " " (Chase Lease #25)		10,336	10,336
" " " (Chase Lease #26)		16,453	16,453
" " " (C.C.I.Co. Land)	15,284	45,852	61,136
Total Developed Ore	112,278	1,502,965	1,615,243
PROSPECTIVE ORE			
Above 7th Lev. (Chase Lease #9)		21,600	21,600
" " " (C.C.I.Co. Land)		78,840	78,840
Total Prospective Ore		100,440	100,440
TOTAL ORE, MORRIS MINE,	112,278	1,603,405	1,715,683

MORRIS LLOYD MINE

ORE IN SIGHT DECEMBER 31ST, 1925.
(CONTINUED)

LLOYD MINE

LOCATION OF ORE	LLOYD ORE	LLOYDDALE	TOTAL TONS
Above 3rd Level	114,712		114,712
PROSPECTIVE ORE			
Below 3rd Level	6,185		6,185
TOTAL ORE, LLOYD MINE,	120,897		120,897

LLOYD EAST

LOCATION OF ORE	LLOYD ORE	LLOYDDALE	TOTAL TONS
Above 2nd Main Sub	51,758	17,045	68,803
" 3rd " "	47,475	211,346	258,821
" 4th " "	10,886	96,252	107,138
Between 3rd & 4th Main Subs	28,020	120,781	148,801
Above and Below 4th Level	231,581	643,242	874,823
Total Developed Ore	369,720	1,088,666	1,458,386
PROSPECTIVE ORE			
Above 4th Main Sub	9,113	21,262	30,375
Total Prospective Ore	9,113	21,262	30,375
TOTAL ORE, LLOYD EAST,	378,833	1,109,928	1,488,761

SUMMARY OF TOTAL ORE

MINE	BESSEMER	LLOYD & MORRIS	LLOYDDALE	TOTAL TONS
Morris,	112,278	1,603,405		1,715,683
Lloyd,		120,897		120,897
Lloyd East,		378,833	1,109,928	1,488,761
GRAND TOTAL,	112,278	2,103,135	1,109,928	3,325,341

Total ore on Chase Lease No. 9	1,017,660	Tons
" " " " " No. 24	134,289	"
" " " " " No. 25	45,098	"
" " " " " No. 26	40,966	"
Total ore on all Chase Leases	1,238,013	Tons
Total ore on Company Lands	2,087,328	"
Grand Total,	3,325,341	Tons

MORRIS LLOYD MINE

ORE IN SIGHT DECEMBER 31ST, 1925.
(CONTINUED)

The following table shows the above tonnages subdivided into grades as reported to the State Tax Commission:-

	MORRIS SHAFT	LLOYD SHAFT	TOTAL
DEVELOPED ORE			
Bessemer	112,278		112,278
Non Bessemer	1,502,965	1,573,098	2,076,063
Silicious			
TOTAL,	1,615,243	1,573,098	3,188,341
PROSPECTIVE ORE			
Bessemer			
Non Bessemer	100,440	36,560	137,000
Silicious			
TOTAL,	100,440	36,560	137,000
GRAND TOTAL,	1,715,683	1,609,658	3,325,341

ORE RESERVES

The following statement shows the ore in sight on January 1st for a number of years back, together with the product, the balance on hand at the close of the year, and the amount of new ore developed in tons each year.

It will be noted that the development work was not allowed to lag behind and more new ore was shown up than during the previous two years.

Estimated Ore	1921	1922	1923	1924	1925
Ore in mine Jan. 1st, Tons	2,260,449	3,038,514	3,309,174	3,306,270	3,309,075
Production, "	209,034	221,979	260,335	246,356	265,829
Balance, "	2,051,415	2,816,535	3,048,839	3,059,914	3,043,246
Ore in mine Dec. 31st, "	3,038,514	3,309,174	3,306,270	3,309,075	3,325,341
Developed during year "	987,099	492,639	257,431	249,161	282,095

LABOR

We were short of men part of the year, particularly in the fall when there was an exodus for Iron Mountain. By the middle of November, we were full handed again.

MORRIS LLOYD MINE

LABOR
(CONTINUED)

There were no changes in the wage schedule during the year. The Morris-Lloyd shafts operated five single shifts a week, while the Barnes-Hecker was put on a five day double shift basis in September, after operating six days a week the early part of the year.

The average contract wages show an increase for all the shafts operated in this district due to the increased use of scraping equipment.

The following table shows the average wages paid contractors for January and November, the December figures not being available at this time.

MORRIS-LLOYD		BARNES-HECKER	
JANUARY	NOVEMBER	JANUARY	NOVEMBER
$5.42	$5.58	$5.15	$5.56

Nothwithstanding the increased earnings of the miners, the underground labor cost for the same months shows a decrease from .793 per ton in January to .655 per ton in November for the Morris-Lloyd shafts and from 1.122 per ton in January to .814 per ton for the Barnes-Hecker property.

We were not employing any more men at the end of the year than at the beginning. The normal crew at the Morris-Lloyd shafts runs about 200 per day.

The following statement shows the men employed by years:-

YEAR	SURFACE MEN	UNDERGROUND MEN	TOTAL MEN
1911	21	88	109
1912	23.5	106	129
1913	50	146	196
1914	56	199	255
1915	67	207	274
1916	66	232	308
1917	59	206	265
1918	55	191	246
1919	53	214	267
1920	53	201	254
1921	54.5	203	257.5
1922	48	162	210
1923	54	157	211
1924	54.5	144	198.5
1925	53	145	198

MORRIS LLOYD MINE

NATIONALITY OF EMPLOYEES

The following table shows for comparison, the kind of labor employed the past year contrasted with 1921.

	1925	1921
English	16	35
French	50	53
Swede	22	22
Norwegian	2	3
Finnish	74	96
Italian	28	22
Scotch	1	2
Austrian	1	0
Irish	1	4
Greek	1	0
Hollander	1	0
Total,	197	237

LABOR COSTS PER TON

YEAR	SURFACE	UNDERGROUND	TOTAL
1913	.164	.781	.945
1914	.172	.920	1.092
1915	.174	.811	.985
1916	.184	.809	.993
1917	.190	.921	1.112
1918	.229	1.028	1.256
1919	.284	1.354	1.638
1920	.309	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

ACCIDENTS

We regret to report a fatal accident during the year. John Mountjoy, timber foreman, was killed while barring a chunk out of a measuring pocket at the 6th level plat Morris shaft. He was trying to dislodge the piece of ore from above by standing in the pocket. He had been warned previously about going into the pocket to do this work as instructions were to get on top the cage and use a long bar reaching across the skip road.

ACCIDENTS
(CONTINUED)

The underground foreman was a witness to the accident as he had hurried to that level upon being informed that the pocket was blocked. He immediately ordered Mountjoy out of the pocket and then climbed down to the platform or runway, where the skip tender stands when operating the levers to open the finger chutes. As the platform is narrow, the skip tender moved back to allow the foreman to pass and the lever controlling the fingers caught in the skip tenders overalls. This admitted air into the cylinder which raised the fingers at the mouth of the storage pocket and allowed enough ore to pass into the measuring pocket to cover Mountjoy completely smothering him.

The accident was caused by the failure of Mountjoy to heed previous warnings and he deliberately violated orders given by the underground foreman.

SURFACE

No new construction work was done during the year on surface, but considerable repairing was finished.

LLOYD SHAFT HOUSE:

This shaft house was a bad fire hazard as it houses a crusher plant and boiler room, both of which are within wooden structures. The timber tunnel leading to this shaft is lined with wood caps, legs and lagging and in order to comply with the receommendation of the fire prevention committee, we covered all the wooden exposed portions of the pockets, buildings and tunnel with expanded metal lath, preparatory to guniting. This work will be completed as soon as the weather moderates in the spring.

STOCKING TRESTLES:

All of the permanent stocking trestles at both Morris and Lloyd shafts were in bad condition. We replaced all of the planking with three inch fir and added new toe boards and railings.

MORRIS LLOYD MINE

SURFACE
(CONTINUED)

WATER SUPPLY:

In order to safeguard our water supply for the location, a check valve was placed in the main near the collar of the Lloyd shaft. The water supply is secured from the second level and in case the discharge pipe broke in the shaft, the water in the supply tank would be drained out before repairs could be finished.

Leaks in the pipe lines around the mine location and in the shaft were also largely eliminated by slowing down the speed of the pump.

We also secured plenty of water for the needs of the location and mines without pumping from the river, a fact which the residents appreciated as the river water is not very palatable.

LOCATION:

We tried to keep the location looking neater than usual last summer. The alleys were cleaned up at regular intervals and some labor spent on the plants and shrubbery. The lots in the South-east end were fenced in. New cess pools were dug when needed instead of trying to clean out the old ones.

We ordered another car load of asbestos shingles and had them put on houses East of the main street. We will probably have to cover the balance of the old roofs left next season as some of the tenants were complaining in the fall about the roofs leaking.

We had seven empty houses at the close of the year compared with fourteen last year.

UNDERGROUND

GENERAL

SCRAPERS:

The scrapers have worked out wonderfully well for us and for the first time in the history of the property, the Morris shaft gangs, exclusive of the sub stope, have given us results comparable with the Lloyd and Section Six.

MORRIS LLOYD MINE

UNDERGROUND

GENERAL
(CONTINUED)

At the close of the year, we had (28) twenty-eight scraper hoists in the North Lake District and of these, six were electrics.

A careful investigation into the results secured by certain gangs in areas where the general conditions remain the same for long periods of time, prove that scrapers increase the efficiency of the same miners almost exactly 90%.

We find the electric scrapers more powerful than the air driven units and the fire hazard has been largely eliminated by using cables for conductors and control boxes.

The scrapers were the greatest single factors in reducing costs in this district.

The following table shows the number of scrapers in operation at the beginning and close of the year.

MORRIS SHAFT		LLOYD SHAFT		SECTION SIX SHAFT	
JANUARY	DECEMBER	JANUARY	DECEMBER	JANUARY	DECEMBER
3	11	2	2	4	6

You will note that the largest number were put into service in the Morris shaft territory, partly to catch up on the accrued royalties on the Chase Leases and partly to bring the tons per man for this area up on a par with the rest of the mine.

GENERAL:

We developed enough new ore in the new deposit between the third and fourth levels, Morris shaft, and on the sixth level in No. 34 contract and in the Lloyd East in No. 12 deposit to more than offset the tonnage mined in the rest of the mine.

MORRIS LLOYD MINE

UNDERGROUND

GENERAL: Continued-

Following is a general description of the mining done in each section of the property.

MORRIS SHAFT

EXCELSIR IRON COMPANYS LANDS

870' SUB:

No. 33 contract started a raise on the fourth level about 800 feet South of the Morris shaft and after raising in Jasper for 135 feet, cut the ore and continued in the same up to the third level. After finishing the raise, they dropped down to the 870 foot elevation and found the ore to extend 300 feet East and West. The width of the ore lens is undetermined except near the raise where it is 48 feet from foot to hanging.

A raise was also run up to the third level at the West end of the sub providing a second outlet and making it possible to work more than one gang of miners to advantage.

EAST DEPOSIT:

Five gangs Nos. 25, 26, 27, 30 and 32 worked out the 775 foot sub , the 765 foot and part of the 755 foot sub level. These contracts were all equipped with scrapers during the year and furnished the bulk of the low phos. Morris ore sold to Charcoal Furnaces. This deposit is petering out rapidly and no work can be done on it below the fourth level until No. 24 Sub Stope is worked out.

Below the fourth level, the horizontal ore area again increases in size forming the main deposit on the seventh level.

On the 610 foot sub, a small exploring drift was carried East to define the limits of the ore. The same procedure was repeated on the 521 foot sub.

MORRIS LLOYD MINE

UNDERGROUND
MORRIS MINE

SIXTH LEVEL:

No. 34 contract drove a main level drift to explore the ore cut in diamond drill holes Nos. 100 and 101. There is undoubtedly some connection between this ore and that found on the 420, 430 and 445 foot subs and it is also more than likely that the ore shown in diamond drill hole No. 58, joins the deposit in No. 34 drift. I would not be surprised but that there was also a connection with the East deposit below the fourth level North of the dike.

No. 37 contract raised from the main level about 250 feet to provide an outlet for the gangs that will mine out the South side of the East deposit below the fourth level.

CHASE LEASE NO. 9

The bulk of the tonnage produced on the lease came from the sub stope territory. We were bothered considerably during the year by falls of Jasper from the hanging, blocking the chutes and preventing the miners blasting Morris grade ore off the foot. It was not until the latter part of the year that we finally cleaned out the Morrisville grade from the three main footwall chutes and started hoisting Morris ore again.

As long as we confine the blasting to the North side of the subs and leave the ore intact next to the hanging, I don't believe we will be bothered much with hanging material slabbing off.

Contracts Nos. 29 and 38 sliced the ore on the 470 foot sub West of the main stope. This ore is an off-shoot to the North-west from the main deposit.

Above the seventh level, we find No. 75 slicing West of the 2200 foot meridian on the 250 and 240 foot subs. This ore is the downward extension of the West end of the main sub stope ore body.

MORRIS LLOYD MINE

UNDERGROUND
MORRIS MINE

CHASE LEASE NO. 24

More development work was done on this lease than on any other in the district.

No. 62 contract spent the entire year following leads of ore by cross-cutting, drifting and raising to the North-east of the trench stope territory. There are a series of dikes in this area and it is difficult to correlate the various lenses except by cross-cutting at various elevations.

No. 73 also worked out a small deposit running from the seventh to the sixth level located between the 3400 and 3600 foot meridians. This ore lens was about 20' x 50' pitching at a steep angle to the East and was mined by the shrinkage stope method.

No. 76 contract raised from the main level up 125 feet to provide an outlet for the gangs that will mine the ore North-west of the trench stope.

TRENCH STOPE:

The scheme of mining ore by the trench method fully justified itself in this instance.

The miners averaged approximately (8) eight tons per man per day, while putting up the trench. After going up (16) sixteen sets or tiers, a leader was followed at the South-west corner of the stope that prevented a regular system of mining being employed until the chimney of ore was worked out and lagged down. This occured at the 269 foot elevation. On the next sub, we found the ore two slices wide and by the time the 250 foot sub was reached, the ore had flattened out so that regular systematic slices were taken on both sides of the trench. Part of the 240 foot sub was also worked out during the year.

The tons per man per day for the two contracts in the trench for the last four months never dropped below 22, running as high as 25.

We are using electric driven scraper hoists here which are giving perfect satisfaction.

MORRIS LLOYD MINE

UNDERGROUND
MORRIS MINE

CHASE LEASE NO. 25

At the extreme West end of the seventh level, we had three gangs mining ore at the close of the year. These contracts are working near the dividing line between Leases Nos. 25 and 26, in fact, some of the development work carried the drifts over onto Lease No. 26.

The first two drifts were driven on the main level on either side of a (10) ten foot dike and then three raises put up to the top of the ore. No. 70 working in the first raise in the East cross-cut, started their sub at the 200 foot elevation. No. 71 also cut out on the same sub from the second raise. No. 72 in the second cross-cut, first cut out at the 170 foot elevation.

All three gangs have scrapers and the ore lenses should widen out as the lower subs are opened up.

A main level drift was also driven West to explore the ore encountered in diamond drill holes Nos. 90 and 93.

No raising was done above the level to determine the extent of the ore lens.

LLOYD MINE

Six gangs were employed here, two of which were equipped with scrapers.

Nos. 15 and 44 worked out the West end of the 1050 foot sub and then dropped down and sliced out most of the ore at the 1040 foot elevation.

Nos. 5, 7 and 11 were employed in the central portion of the deposit. After finishing the 1015 foot sub, mining was started on the next sub below.

No. 16 slicing at the extreme East end of the main deposit finished work at the 1030 foot elevation and was getting ready to drop down and start a new sub at the close of the year.

MORRIS LLOYD MINE

UNDERGROUND

LLOYD EAST

The end of the year finds half the gangs in this portion of the property using scrapers. An examination of the maps shows that the gangs have done pretty good work as a number of subs have been mined out rapidly. This section of the mine is compact and gets better supervision than the balance of the mine as the shift boss can make his rounds in (1½) one and one-half hours easily.

Mining has been carried on in four separate areas, the main deposit, Nos. 10, 12 and 17 deposits. The work in detail is as follows:-

No. 17 finished the small lens 200 feet South of Section Six Shaft. The last sub at the 1430 foot elevation was worked out in December.

No. 40 mining No. 10 deposit sliced out two subs below the second transfer level. This deposit which runs all the way down to the main third level, 350 feet below, dips off very flat to the third main sub or transfer level and a new raise was started near the close of the year to take care of this, otherwise considerable drifting in Jasper would be found necessary on each sub. The ore from the new raise will have to be transferred about 100 feet on the third main sub.

In No. 12 deposit contract No. 1 repaired the 1290 foot sub drift and put up five raises to the top of the ore. Drifting under the hanging was started from the tops of these raises in December.

In the main deposit No. 20 sliced out the ore at the East end to the second main sub. On the West side of this deposit Nos. 8 and 46 mined out three subs, No. 8 being bottomed on the 1410 foot sub, while No. 46 got down to the 1380 foot elevation. In the central portion of the deposit Nos. 2, 9, 10, 19, 100 and 102 worked out the ore from the 1410 foot sub to the 1370 foot sub, No. 100 actually dropping down to the 1350 foot sub in December.

MORRIS LLOYD MINE

UNDERGROUND

GENERAL

It is interesting to note how the tons per miner per day has increased in the central and West portions of the property since the use of scrapers has become more general. The following table shows the tons per day per miner for the first and last months of the year 1925.

TONS PER DAY PER MINER

TERRITORY	NO. OF GANGS	BEGINNING OF YEAR	END OF YEAR	IMPROVEMENT
Section Six Shaft	12	13.38	13.37	None
Lloyd "	6	11.23	13.47	20%
Morris "	19	8.78	13.46	53%

You will note that the East end of the mine, which has always topped all the other portions of the property, is actually behind the Lloyd and Morris. That is entirely due to the scrapers put in during the last six months.

DIAMOND DRILLING

Diamond drill work was carried on underground part of the year. A total of (8) eight holes were drilled. We were successful in finding some very good runs of ore in the last holes put in. Holes Nos. 94, 95, 97, 98, and 99 were located on the fourth level to explore the crotch between the main dike and slate foot directly South of the Morris shaft. The material cut in these holes follows:-

No. 94 went in 276 feet and cut nothing but rock and lean ore.

No. 95 was bottomed at 275 feet after going through five feet of high grade ore.

No. 97 went through the dike at 397 feet without finding any ore.

No. 98 was bottomed in soft ore Jasper at 446 feet and found no ore.

No. 99 was drilled to a depth of 602 feet but found no ore.

MORRIS LLOYD MINE

DIAMOND DRILLING
(CONTINUED)

It was then decided that the prospects for ore were much brighter lower down and accordingly, the next two holes were located on the sixth level. Our theories proved correct as the following holes show.

Diamond drill hole No. 100 on sixth level cut three runs of ore, (15) fifteen feet of 60.77 Iron content, 15 feet running up to 63.90 Iron and (3) three feet of 59.00% material.

Diamond drill hole No. 101 was an exceptionally good hole, drilling through (80) eighty feet of ore averaging approximately 59.00% Iron. In addition, the hole went through 160 feet of second class ore running around 54.00% Iron.

DRIFTING AND RAISING

Very little rock drifting was done in 1925. Four separate main level drifts were driven in ore on the sixth and seventh levels. Besides this there was more or less drifting on sub levels, such as the work Nos. 33 and 62 did nearly the entire year. The totals for 1925 are way in excess of the previous years.

We did more raising than last year also. The reason for this is that in spite of the increased production, we did not allow our development work to lag behind, in fact, we developed more ore than we mined. The following table shows the amount of ore drifting and ore and rock raising for the past two years.

YEAR	ORE DRIFTING	ORE RAISING	ROCK RAISING
1924	1945 Ft.	803 Ft.	359 Ft.
1925	2794 Ft.	1288 Ft.	424 Ft.

You will note that in each case the totals for the past year are in excess of the previous year.

MORRIS LLOYD MINE

TIMBERING

We are put to considerable expense repairing the long raises in Section Six territory. Usually there are crews on both Saturday and Sunday each week end and the cost runs about $500.00 a month. In putting up the raises from the sixth to the fourth level Morris shaft territory, we are off-setting them at 100 foot intervals and putting in chutes and stoppers to break the fall of the dirt.

The timber requirements for 1926 include more timber 8 to 10 size than any other. This sort of timber is usually a drug on the market and can be purchased cheap as it is too small for saw mill use and the jobber is willing to dispose of it cheap for mine timber. We find that by using scrapers, a given territory is worked out much faster than formerly so that smaller timber can be used to advantage.

COMPRESSORS AND AIR PIPES

We made an effort to salvage a great deal of pipe underground. The old pipes were collected and rethreaded and fittings used over again. There isn't any question but that we saved considerable money. The consumption of pipe for the past five months compares with the previous (19) nineteen months as follows:-

	1" PIPE	2" PIPE
Jan. 1st, 1924 - Aug. 1st, 1925	4224'	3441'
Aug. 1st, 1925 - Jan. 1st, 1926	125	160

We had no trouble whatsoever with the compressors as they functioned perfectly all year. We saved considerable air by shutting the compressors down during the noon hour and cutting down the running time, both at the beginning and end of the shift.

MORRIS LLOYD MINE

SHIFT BOSSES

A change was made in the territory handled by the bosses. The Lloyd shaft and the gangs above the fourth level in the Morris shaft are now looked after by the same boss. That gives Tippett (12) twelve gangs, W. Pascoe (11) eleven gangs and C. Pascoe & Scarffe (14) fourteen gangs which divides them up fairly equally.

POWER DRILLS

We purchased but two auger drills during the year, they being of the R. B. 10 Type. The Ingersoll-Rand now manufacture a R.B. 12 machine that was on trial in the mine at the close of the year. This latter machine made quite a hit with the men as it has an air cushion on both ends of the cylinder, making it a very easy machine to hold. All the BBR230 auger drills were also equipped with spring steel holders.

In this connection, I might state that during the year we made exhaustive tests on drill bits. We tried out five types of bits and three kinds of drill steel. The bit as finally adopted was similar to that used at the Holmes Mine, but we improved on their bit. Tests were run until we determined the proper angle of the cutting edge, the correct width and thickness, the angle of clearance and the proper shape of the sides of the bit. We increased the drilling speed considerably as we found for instance in the Trench Stope, that we could bottom a six foot hole in less than two minutes with the new bit, whereas, with the old style, we averaged only about (15") fifteen inches per minute in the same ground.

Repair parts for the auger drills cost $52.33 per machine for the year compared with $50.23 for last year.

MORRIS LLOYD MINE.

PUMPS

We purchased a new gear and pinion for our Prescott pumps on the fourth level.

The amount of water pumped in 1925 is considerably less than 1924. The gallons of water pumped per minute for the past five years are as follows:-

1921	-	611	Gallons	per	minute
1922	-	525	"	"	"
1923	-	507	"	"	"
1924	-	466	"	"	"
1925	-	328	"	"	"

The water supply for the location is taken from the second level Lloyd shaft and by employing a pumpman night shift during the summer, it was possible to keep the storage tank filled without running the pump at the Morris shaft engine house which takes water from a small creek. Heretofore, this swampy water was mixed with that from underground, making it undersirable for drinking purposes.

ELECTRIC TRAM EQUIPMENT

There are nearly 100 motor cars used underground and a great many of them were found in bad shape. Since April, we have rebuilt a car a week in our shop.

HOISTING PLANT

Our hoisting plants at both the Morris & Lloyd shafts are in poor shape. At the Morris mine, the skip hoist is way overloaded and a new 750 H.P. motor should be installed at once. That would involve the purchase of a new gear and the transformer equipment would need revamping. The change could be made for an expenditure of about $12,000.00. The old double reduction gears and pinions should then be repaired and installed on the Lloyd skip hoist.

MORRIS LLOYD MINE

STOCKING ORE

The Lloyd ore stocked during the past two years has been all of the Lloyddale grade only a few tons of ore suitable for Charcoal Furnaces being stocked when short of cars. We expect to put all this high phos. Lloyd ore in a separate pile West of the shaft soon.

Next season high phos. ore can be loaded out of both Morris and Lloyd piles by going in on the South side of the stocking area, while the low phos. ore for Charcoal Furnaces will be found on the North side.

CRUSHER

We continue to crush the ore for Pioneer #2, Antrim, Cadillac and Wells in our crusher at the Lloyd shaft. Morris ore is hauled across on the fourth level and hoisted through the Lloyd shaft to prepare it for furnace use.

SHAFTS

We largely eliminated one heavy item of expense during the year by changing the chute closers at both shafts on all the levels.

Our shaft plats have large storage pockets which have been equipped for years with finger chutes. When the ore is wet, a great deal of it dribbled through the fingers into the measuring pockets overloading the skips. As a result, it was customary to clean skip pits from three to four times a week in each shaft. Furthermore, this ore spilled into the shaft did more or less damage to the dividers so that they had to be taken out and replaced with new material.

We installed air lifts and solid plate doors and as a result, have cut the schedule for cleaning the skip pit down to once in a week and a half. As it takes six men to handle the cars used in doing that work, the saving in labor is considerable not to mention fewer repairs needed in the shaft.

MORRIS LLOYD MINE

EXPLOSIVES

We are now using a larger proportion of 60% Gelatine than last year for three reasons. First; we found that there was a decided advantage in breaking the ore finer when using scraping equipment, as the men do less picking and the bottom breaks better by substituting 60% Gelatine for 40% Dynamite. Secondly; we blast any time during the shift in order to speed up the scraping gangs and the Gelatine is less gassy and the fumes do not bother the other gangs nearby. Thirdly; by buying 1-1/4" Gelatine instead of 1-1/2" Dynamite, there are enough additional sticks in each box to offset the increased price per pound.

The following statement shows the amount of powder used for the past four years and other data comparing the different years.

STATEMENT OF EXPLOSIVES USED FOR BREAKING ORE

KIND	AMOUNT 1922	AMOUNT 1923	AMOUNT 1924	AMOUNT 1925
40% Dynamite	18,216.50	20,892.64	14,765.61	11,414.25
60% Gelatine	1,505.18	1,732.28	3,502.14	8,891.80
Total Powder	19,721.68	22,624.92	18,267.75	20,306.05
Fuse	2,465.24	2,787.03	2,090.50	2,522.62
Caps	711.54	923.00	738.26	834.99
Tamping Bags	43.21	43.00	28.70	136.15
Cap Crimpers	26.77	13.92	6.18	12.03
Total Fuse Etc.	3,246.76	3,766.95	2,863.64	3,505.79
Total Explosives	22,968.44	26,391.87	21,131.39	23,811.84
Product	221,979	260,335	246,356	265,829
Lbs. Powder Per Ton of Ore	.609	.639	.528	.518
Cost Per Ton for Powder	.089	.087	.074	.0764
" " " " Fuse	.014	.014	.012	.0132
" " " " All Explosives	.103	.101	.086*	.0896
Average Price Per Pound for Powder	.146	.136	.1404	.1474

*NOTE:- The cost per ton for all explosives for 1924 is shown as .086. Actually it was .093 as 19,186 tons of stockpile over-run was added to the 1924 production figures. The explosive cost for breaking ore in 1925 was the lowest for years and it is due to the more general use of tamping bags.

MORRIS LLOYD MINE

GENERAL SUPPLIES

There is not much variation in the amount of iron and steel, oil and grease, fuel, electric power, etc. used for the past two years with the exception of the general supplies, which show a large decrease for 1925, due to fewer hoisting ropes purchased, less rope needed for the top trams and the carbon loss for 1925 is considerably less than for 1924, due to the diamond drill operating only about half this past year.

TONS PER MAN PER DAY

The mine has shown a healthy increase in the tonnage secured from each man employed for the past four years, but by far the best record was obtained in the last half of 1925. The following table shows results secured in previous years, together with the monthly figures for 1925. You will note the marked improvement since May 1925, when the tons per man per day exceeded 5 for the first time.

TONS PER MAN SHIFT

YEAR	SURFACE	UNDERGROUND	TOTAL
1913	14.10	3.52	2.80
1914	13.86	3.09	2.53
1915	13.38	3.48	2.76
1916	15.57	4.00	3.18
1917	18.29	4.27	3.46
1918	20.45	5.04	4.04
1919	18.33	4.44	3.57
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
JAN. 1925	16.30	6.27	4.53
FEB. "	17.52	6.43	4.71
MAR. "	18.04	6.38	4.71
APR. "	18.25	6.29	4.68
MAY. "	20.43	6.69	5.04
JUN. "	21.38	6.46	4.96
JUL. "	21.79	6.80	5.18
AUG. "	21.00	6.93	5.21
SEP. "	23.13	7.07	5.41
OCT. "	24.26	7.82	5.91
NOV. "	24.19	7.77	5.88
DEC. "	21.03	7.32	5.43
TOTALS FOR 1925	20.45	6.85	5.13

MORRIS LLOYD MINE

STOPING TONS PER MAN

YEAR 1919	8.75
" 1920	9.27
" 1921	10.20
" 1922	13.82
" 1923	15.54
" 1924	15.67
" 1925	17.10

In the last six years, the miners have doubled the amount of ore broken each day and the figures for 1925 again show an increase.

TAXES

Tabulations of tax figures are always interesting and we have compiled these for both Ishpeming and Ely Townships. The Lloyd and Section Six shafts are in Ishpeming Township. The Morris shaft is in Ely Township as well as the Barnes-Hecker property.

	1923		1924		1925	
	VALUATION	AMOUNT	VALUATION	AMOUNT	VALUATION	AMOUNT
LLOYD MINE						
Realty	869950.00	27440.21	701450.00	17886.61	561450.00	15351.58
Personal	360500.00	11370.44	408000.00	10404.04	340000.00	9296.59
TOTAL LLOYD & SEC. 6	1230450.00	38810.65	1109450.00	28290.65	901450.00	24648.17
MORRIS MINE						
Realty	525540.00	13833.57	479540.00	12542.00	499600.00	12715.82
Personal	280000.00	7381.09	461000.00	12082.58	306000.00	7794.37
TOTAL MORRIS	805540.00	21214.66	940540.00	24624.58	805600.00	20510.19
GRAND TOTAL	2035990.00	60025.31	2049990.00	52915.23	1707050.00	45158.36
PRODUCT TONS		260,335		246,356		265,829
TAXES PER TON PRODUCED		.2305		.2148		.1698
SHIPMENT TONS		210,692		269,228		240,145
TAXES PER TON SHIPPED		.2848		.1965		.1879
BARNES HECKER MINE						
Realty	77940.00	2054.57	42940.00	1125.44	28000.00	712.61
Personal	63750.00	1680.51	141000.00	3706.03	251000.00	6388.45
TOTAL BARNES HECKER	141690.00	3735.08	183940.00	4831.47	279000.00	7101.06
PRODUCT TONS		36,228		75,857		138,582
TAXES PER TON PRODUCED		.1030		.0638		.0513
SHIPMENTS		17,019		17,100		124,498
TAXES PER TON SHIPPED		.2195		.2826		.0568

MORRIS LLOYD MINE

TAXES
(CONTINUED)

TAXES RAISED ISHPEMING TOWNSHIP

TAX	1922	1923	1924	1925
State	5,017.19	4,487.96	3,438.00	3,504.98
County	6,226.16	7,600.00	5,975.52	5,429.85
County Road	4,954.32	4,902.72	4,535.22	3,293.77
Township Cont.	2,000.00	2,000.00	2,000.00	
Highway Imp.	3,600.00	8,600.00	1,125.00	3,000.00
Road Repair	2,500.00	2,500.00	2,500.00	3,000.00
School	26,325.88	19,362.71	17,500.00	15,690.00
One Mill	1,674.12	1,637.29	1,518.42	1,310.00
Rejected	16.70	21.97	1.96	233.61
TOTAL TAX	52,314.37	51,113.57	38,594.12	35,462.21
Tax paid by C.C.I.Co.		42,779.78	31,480.63	28,059.86
Percentage of Tax Paid by C.C.I.Co.		82.84	81.29	78.38
Assessed Valuation	1,674,116.00	1,637,000.00	1,518,000.00	1,310,000.00
Tax Rate	3.126	3.120	2.525	2.707

TAXES RAISED ELY TOWNSHIP

TAX	1922	1923	1924	1925
State	4,294.88	4,257.67	3,689.40	4,239.00
County	5,329.80	7,210.89	6,412.45	6,566.98
County Road	4,241.07	4,651.14	4,866.85	3,983.55
Highway Imp.	3,000.00	3,500.00	3,500.00	3,500.00
Road Repair	3,000.00	4,000.00	4,000.00	4,000.00
School	11,000.00	12,000.00	12,000.00	12,000.00
One Mill	1,432.62	1,552.51	1,629.00	1,584.37
Bridge	1,000.00	1,000.00	1,500.00	1,500.00
Rejected	10.17	52.14	29.86	96.43
School Building			2,000.00	
Township Cont.	2,000.00	2,000.00	2,000.00	2,000.00
Library			200.00	
TOTAL TAX	35,308.54	40,224.35	41,827.56	39,470.33
Tax paid by C.C.I.Co.		25,601.87	30,104.64	28,656.11
Percentage of Tax Paid by C.C.I.Co.	62.6	62.6	71.5	71.05
Assessed Valuation	1,432,620.00	1,553,000.00	1,629,000.00	1,584,000.00
Tax Rate	2.47	2.59	2.57	2.52

The total amount of taxes paid by our company which includes those of the Land Department are less for 1925 than the previous year. The valuation of the Morris-Lloyd mine for 1925 is considerably less than the figures for previous years, while the Barnes Hecker shows an increase. The grand total of both properties, however, is less than formerly.

MORRIS LLOYD MINE.

MORRIS LLOYD MINE

LEASES

TONNAGES MINED AND ACCRUED ROYALTIES

We have tried to increase production from the Chase Leases and we are pleased to report the largest tonnages ever hoisted, exceeding our minimum requirements by 110,644 tons.

The following table shows the ore mined each year on these leases:-

TONS ORE MINED

YEAR	MORRIS LLOYD MINE LEASES NOS. 9,24,25,26,27 & 28	BARNES HECKER MINE LEASE NO. 31	TOTAL
1912	968		968
1913	15,345		15,345
1914	36,267		36,267
1915	67,740		67,740
1916	68,524		68,524
1917	36,944		36,944
1918	24,290		24,290
1919	37,357		37,357
1920	55,331		55,331
1921	75,963	213	76,176
1922	106,119	20,313	126,432
1923	122,610	36,228	158,838
1924	111,008	75,857	186,865
1925	119,562	138,582	258,144
TOTAL	878,028	271,193	1,149,221

TOTAL ROYALTIES ACCRUED AND PRODUCTION FROM LEASES

MINE	NO. OF LEASE	ACCRUED	MINED	BALANCE
Morris-Lloyd	9	172,283	746,309	573,926
" "	24	241,088	97,251	143,837
" "	25	241,088	26,602	214,486
" "	26	231,713	7,788	223,925
" "	27	209,213	178	209,035
" "	28	104,607		104,607
Barnes-Hecker	31	875,000	271,193	603,807
GRAND TOTAL		2,074,992	1,149,221	925,771

The minimum royalties for the above leases call for a production of 147,500 tons yearly.

MORRIS LLOYD MINE

TABLE SHOWING BALANCE DUE ON ACCRUED ROYALTIES

YEAR	ACCRUED	MINED	BALANCE
1918	1,082,180	250,078	832,102
1919	1,224,992	287,435	937,557
1920	1,372,492	342,766	1,029,726
1921	1,502,492	418,942	1,083,550
1922	1,632,492	545,374	1,087,118
1923	1,779,492	704,212	1,075,280
1924	1,927,492	891,077	1,036,415
1925	2,074,992	1,149,221	925,771

If production from these leases continues at the same rate as it has the last six months of 1925, it will take only about six and one-half years to earn enough royalties to pay off the balances due.

It is more than likely, however, that within that period there will be an increased demand for ore and we will catch up sooner with the royalties accrued. Furthermore, we expect the Barnes-Hecker property to improve with depth, allowing us to work more miners which will further tend to increase the earning capacity of Lease No. 31.

ESTIMATE OF PRODUCTION

The estimate of production for the 1926 shipping season, assuming the miners to operate five single shifts a week, is based on 259 working days at 1050 tons per day. That makes a total of 271,950 tons of ore of all grades.

COST OF PRODUCTION

The costs for the past year show a decrease compared with 1924. They are the lowest since 1916, when wages were 60% lower. This is shown plainly by the following table, which shows comparisons for the past twelve years.

MORRIS LLOYD MINE

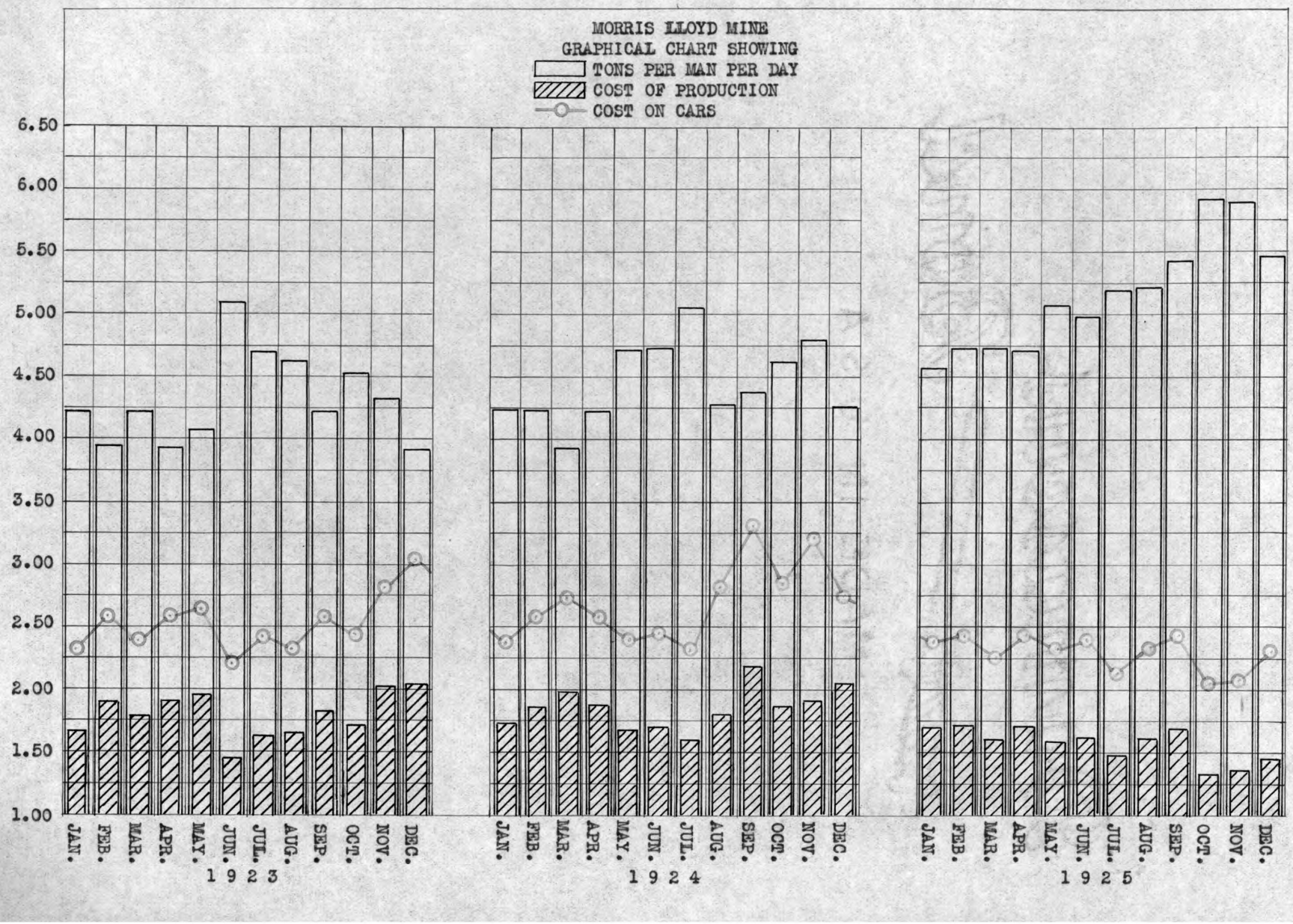
COST OF PRODUCTION

	PRODUCTION	DAILY PRODUCT	COST OF PRODUCTION		
			LABOR	SUPPLIES	TOTAL
YEAR 1914	192,145	643	1.010	.535	1.545
" 1915	221,585	729	.804	.440	1.244
" 1916	307,685	942	.911	.501	1.412
" 1917	284,000	940	1.113	.467	1.580
" 1918	289,500	975	1.237	.602	1.839
" 1919	282,483	945	1.553	.613	2.166
" 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	1022	.977	.596	1.573
JAN. "	20,686	940	1.098	.627	1.725
FEB. "	19,262	963	1.059	.667	1.726
MAR. "	21,327	969	1.044	.577	1.621
APR. "	20,254	920	1.056	.660	1.716
MAY. "	20,835	992	.989	.603	1.592
JUN. "	21,166	962	1.011	.621	1.632
JUL. "	23,311	1009	.981	.502	1.483
AUG. "	21,994	1047	.977	.633	1.610
SEP. "	21,995	1047	.939	.752	1.691
OCT. "	25,362	1153	.857	.484	1.341
NOV. "	23,604	1124	.870	.497	1.367
DEC. "	26,033	1132	.915	.567	1.482

* NOTE:- Production for 1924 includes 19,186 tons of over-run from stockpiles.

It will be also noted that the cost of production in 1925, particularly the last three months, compares very favorably with the figures for the years 1915 and 1916 when wages averaged at least 60% less.

The foregoing table also indicates how the daily average production has been gradually increasing to the highest point in the history of the these properties. The figures for November and December would also have been larger if we had been shipping from the pockets and had the benefit of the over-run.


MORRIS LLOYD MINE
GRAPHICAL CHART SHOWING
TONS PER MAN PER DAY
COST OF PRODUCTION
COST ON CARS
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
JAN.
FEB.
MAR.
APR.
MAY.
JUN.
JUL.
AUG.
SEP.
OCT.
NOV.
DEC.
1923
1924
1925

LLOYD MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1925.

GRADE	IRON	PHOS.	SILICA
Lloyd,	58.00	.137	6.43
Lloyddale,	(No Production)		
Lloyd Silica,	50.99	.077	17.14

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1925

GRADE	Mine IRON	Mine PHOS.	Mine SILICA	Lake Erie IRON	Lake Erie MOIST.
Lloyd,	59.60	.124		-	
Lloyddale,	(No Shipments)				
Lloyd Silica,	(All Mixed)				

ORE STATEMENT - DECEMBER 31ST, 1925.

	LLOYD	LLOYDDALE	LLOYD SILICA	TOTAL	TOTAL LAST YEAR
On hand January 1, 1925,	117,373	-	14,538	131,911	177,317
Output for Year,	105,316	-	8,039	113,355	99,860
Transferred,	-	-	13,042	13,042	13,485
Stockpile Overrun,	-	-	-	-	2,418
Total,	222,689	-	35,619	258,308	293,080
Shipments,	67,956	-	21,081	89,037	161,169
Balance on Hand,	154,733	-	14,538	169,271	131,911
Increase in Output,				11,077	
Increase in Ore on Hand,				37,360	

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

1924 -- 1-8 Hour Shift, 6 days per week, Jan. 1st to July 26th, 1924.
1-8 Hour Shift, 4 days per week, July 26th to Nov. 30th, 1924.
1-8 Hour Shift, 5 days per week, Dec. 1st to Dec. 31st, 1924.

LLOYD MINE

SHIPMENTS FOR YEAR-1925.

GRADE	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Lloyd,	34,640	33,316	67,956	104,115
Lloyddale,	-	-	-	25,171
Lloyd Silica,	17,888	3,193	21,081	31,883
Total,	52,528	36,509	89,037	161,169
Total Last Year,			161,169	
Decrease,			72,132	

MORRIS MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1925.

GRADE	IRON	PHOS.	SILICA
Morris Bessemer,	(No Production)		
Morris,	58.73	.099	7.02
Morrisville,	49.76	.062	20.29

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1925.

GRADE	Mine IRON	Mine PHOS.	Mine SILICA	Lake Erie IRON	Lake Erie MOIST.
Morris Bessemer,	(No Shipments)				
Morris,	58.70	.067	-	-	- (**)
Morrisville,	(All Mixed)				

NOTE: (**) This represents two cargoes going to East Jordan Furnace

ORE STATEMENT - DECEMBER 31ST, 1925.

	MORRIS BESSEMER	MORRIS	MORRISVILLE	TOTAL	TOTAL LAST YEAR
On hand January 1, 1925,	-	186,709	5,568	192,277	169,743
Output for Year,	-	100,568	51,906	152,474	127,310
Transferred,	-	-	13,042	13,042	13,485
Stockpile Overrun,	-	-	-	-	16,768
Total,	-	287,277	44,432	331,709	300,336
Shipments,	-	122,435	28,673	151,108	108,059
Balance on Hand,	-	164,842	15,759	180,601	192,277
Increase in Output,				8,396	
Decrease in Ore on Hand,				11,676	

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

1924 -- 1-8 Hour Shift, 6 days per week, Jan. 1st to July 26th, 1924.
1-8 Hour Shift, 4 days per week, July 26th to Nov. 30th, 1924.
1-8 Hour Shift, 5 days per week, Dec. 1st to Dec. 31st, 1924.

MORRIS MINE

SHIPMENTS FOR YEAR-1925

GRADE	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Morris Bessemer,	-	-	-	-
Morris,	60,095	62,340	122,435	27,084
Morrisville,	3,622	25,051	28,673	80,975
Total,	63,717	87,390	151,108	108,059
Total Last Year,			108,059	
Increase,			43,049	

MORRIS-LLOYD MINE

COMPARATIVE MINING COST FOR YEAR

	1925	1924	INCREASE	DECREASE
PRODUCT	265,829	246,356	19,473	
Underground Costs	1.212	1.297		.085
Surface Costs	.227	.225	.002	
General Mine Accounts	.134	.162		.028
Cost of Production	1.573	1.684		.111
Original Cost	.034	.034		
Pla nt Account	.263	.263		
Taxes	.170	.215		.045
Central Office	.087	.088		.001
Contingent Expense	.069	.038	.031	
Cost Adjustment	.018	.018		
Cost on Stockpile	2.214	2.340		.126
Loading & Shipping	.082	.116		.034
Total Cost on Cars	2.296	2.456		.160
No. Days Operating	260	262		2
No. Shifts & Hours	1-8	1-8		
Avg. Daily Product	1022	940	82	
COST OF PRODUCTION				
Labor	.978	1.026		.048
Supplies	.595	.658		.063
Total	1.573	1.684		.111

MORRIS-LLOYD MINE

COMPARATIVE WAGES AND PRODUCT

	1925	1924	INCREASE	DECREASE
PRODUCT	265,829	246,356	19,473	
No.Shifts & Hours	1-8	1-8 hr.		
AVG.NO.MEN WORKING				
Surface	45	44	1	
Underground	145	144	1	
Total	190	188	2	
AVG.WAGES PER DAY				
Surface	4.34	4.29	.05	
Underground	5.02	4.94	.08	
Total	4.85	4.78	.07	
WAGES PER MO.OF 25 DAYS				
Surface	108.50	107.25	1.25	
Underground	125.50	123.50	2.00	
Total	121.25	119.50	1.75	
PRODUCT PER MAN PER DAY				
Surface	20.45	19.08	1.37	
Underground	6.85	6.42	.43	
Total	5.13	4.80	.33	
LABOR COST PER TON				
Surface	.212	.225		.013
Underground	.733	.770		.037
Total	.945	.995		.050
AVG.PRODUCT BRK'G & TRM'G	11.59	10.70	.89	
" WAGES CONTRACT MINERS	5.48	5.32	.16	
" " " LABOR	5.48	5.32	.16	
TOTAL NO.OF DAYS				
Surface	12,998	12911½	86½	
Underground	38,798¼	38384¾	413½	
Total	51,796¼	51296¼	500	
AMOUNT FOR LABOR				
Surface	56432.49	55422.26	1010.23	
Underground	194847.06	189689.21	5157.85	
Total	251279.55	245111.47	6168.08	

Proportion Surface to Underground Men:
1925 - 1 to 3.22
1924 - 1 to 3.27
1923 - 1 to 3.4
1922 - 1 to 3.7
1921 - 1 to 4.9

1924 - 1-8hr. shift 4 days per week, July 30th to Dec.1st;
1-8hr. " 5 " " " Dec. 1st.

MORRIS LLOYD MINE.

MORRIS-LLOYD MINE

TIMBER STATEMENT FOR THE YEAR ENDING DECEMBER 31, 1925.

KIND	LINEAL FEET	AVG. PRICE PER FOOT	AMOUNT 1925	AMOUNT 1924
6" to 8" Timber	84,312	.0394	3,322.72	1,559.97
8" to 10" "	33,752	.0668	2,255.05	2,575.47
10" to 12" "	36,328	.0945	3,434.91	2,700.16
12" to 14" "	7,760	.119	922.74	1,458.77
Total Timber - 1925	162,152	.0613	9,935.42	
Total Timber - 1924	108,437	.0764		8,294.37
		PER 100'		
5' Lagging	161,500	.879	1,420.08	855.83
8' "	446,008	.737	3,287.30	2,701.25
Total Lagging	607,508	.775	4,707.38	3,557.08
3" Poles	148,270	1.24	1,839.61	3,102.79
Total Lagging & Poles-1925	755,778	.866	6,546.99	6,659.87
" " -1924	713,127	.934	6,659.87	
5/8" Covering Boards,Bd.ft.	66,270	1.840	1,219.09	1,710.45

Product		265,829	246,356
Ft. Timber per ton of ore		.61	.439
" Lagging "		2.84	1.95
" " per ft. of timber		3.74	4.44
Cost per ton for timber		.0374	.0337
" covering boards		.0046	.0069
" lagging		.0177	.0144
" poles		.0069	.0126
" all timber,etc.		.0666	.0676
Equivalent of stull timber to bd.measure		267,581	200,222
Feet bd.measure per ton of ore		1.006	.813
Cost of timber, lagging, poles,etc.	1925	17,701.50	
	1924	16,664.69	
	1923	15,207.16	
	1922	11,735.86	
	1921	19,348.78	
	1920	17,177.57	
	1919	17,277.93	
	1918	15,676.42	

MORRIS-LLOYD MINE.

MORRIS-LLOYD MINE

STATEMENT OF EXPLOSIVES USED FOR BREAKING ORE

KIND	QUANTITY	AVERAGE PRICE	AMOUNT 1925	AMOUNT 1924
40% Powder	84,550	13.50	11,414.25	14,765.61
60% "	53,188	16.75	8,891.80	3,502.14
Total Powder	137,738	14.74	20,306.05	18,267.75
Fuse	395,700		2,522.62	2,090.50
Caps	78,400		834.99	738.26
Tamping Bags	63,275		136.15	28.70
Cap Crimpers	24		12.03	6.18
Total Fuse,Etc.			3,505.79	2,863.64
Total Explosives			23,811.84	21,131.39
Product			265,829	246,356
Pounds Powder per Ton of Ore			.518	.528
Cost Per Ton for Powder			.0764	.074
" " Fuse, Etc.			.0132	.012
" " All Explosives			.0896	.086
Average Price Per Pounds for Powder			.1474	.14

MORRIS LLOYD MINE

ANALYSIS OF COST SHEETS, EXPLAINING INCREASE OR DECREASE IN VARIOUS ACCOUNTS BETWEEN THE YEAR 1924 AND 1925.

UNDERGROUND COSTS

ACCOUNT
EXPLORING IN MINE

Year 1924	$9,432.38
" 1925	5,624.48
Decrease	$3,807.90

Decrease for 1925 due to operating drill only part of the year. In 1924 exploring was conducted for twelve months.

In 1924 - 3266 feet were drilled at a cost of $2.87 per foot compared with 2352 feet at $2.39 per unit in 1925.

ACCOUNT
DEVELOPMENT IN ROCK

Year 1924	$9,566.15
" 1925	5,924.47
Decrease	$3,641.68

Footage for 1925 totalled 806 feet compared with 1173 feet for 1924. Cost per foot in 1924 was $8.16 and in 1925 $7.36. The decrease in unit costs is due to the fact that during the past year, no effort was made to attain maximum footage per day as in previous years. Speed was not particularly imperative and we tried to do the work as economically as possible.

ACCOUNT
DEVELOPMENT IN ORE

Year 1924	$ 8,820.34
" 1925	16,486.80
Increase	$ 7,666.46

Increase in this account due to more development work carried on. The ore drifting and raising for the past two years are as follows:-

	Ore Drifting	Raising
Year 1924	1945 Ft.	1162 Ft.
" 1925	2794 Ft.	1712 Ft.

ACCOUNT
STOPING

Year 1924	$116,738.82	Cost Per Ton .474
" 1925	116,148.71	" " " .437
Decrease	$ 590.11	" " " .037

The decrease in the unit cost for 1925 is actually more than shown, due to adding a total of 19,186 tons of stockpile over-run to the 1924 production. We produced 265,829 tons in 1925 compared with 227,170 tons in 1924 for practically the same total expenditure for stoping.

MORRIS LLOYD MINE

UNDERGROUND COSTS

ACCOUNT
STOPING - Continued-

The cost was decreased because more scrapers were added to our equipment. Ten complete outfits including hoists, booms and scrapers, were purchased and charged out in 1925. These scrapers increased the efficiency of the Morris shaft territory 53% and the Lloyd shaft 20%.

We also used less explosives in breaking the ore. The cost per ton for powder, fuse and caps is constantly decreasing as shown in the following table:-

Year 1922	-	.103
" 1923	-	.101
" 1924	-	.093
" 1925	-	.089

The decrease can be attributed to the fact that the entire mine was using tamping bags after June 1st, 1925.

ACCOUNT
TIMBERING

Year 1924	$54,313.75	Cost Per Ton	.221
" 1925	60,466.98	" " "	.227
Increase	$ 6,153.23	" " "	.006

Increase in this account due to more timber used because of the new sub levels started in new territory.

This account also includes the cost of repairing the long raises in the Lloyd East territory.

ACCOUNT
TRAMMING

Year 1924	$40,470.84	Cost Per Ton	.164
" 1925	42,725.63	" " "	.161
Increase	$ 2,254.79	Decrease	.003

Although the total cost shows an increase, the unit cost is less for 1925 by .003.

Our tramming expense is larger for 1925 due to operating the seventh level motor night shift. It is not possible with one motor crew to keep the seventh level gangs going, because the trench stope, No. 73 shrinkage stope and Nos. 70, 71 and 72 gangs are so far from the hoisting shaft. The extra expense is more than offset by the additional tonnage produced.

ACCOUNT
VENTILATION

Year 1924	$443.09
" 1925	604.08
Increase	$160.99

Increase due to installing new motor on ventilating fan on sixth level.

MORRIS LLOYD MINE

UNDERGROUND COSTS

ACCOUNT
PUMPING

Year 1924	$17,322.98
" 1925	13,958.88
Decrease	$ 3,364.10

Decreased due to lower maintenance cost. Pumpmens labor also less due to employing but two pumpment for the entire year of 1925. Large decrease in current consumption, the cost for power being $11,461.62 and $8,663.13 respectively for 1924 and 1925.

ACCOUNT
COMPRESSORS AND
AIR PIPES

Year 1924	$19,501.04	Cost Per Ton	.079
" 1925	23,974.51	" " "	.090
Increase	$ 4,473.47	" " "	.011

Increase due to larger consumption of electric power, due to use of additional scraper hoists. The amount expended for air pipes is practically the same for the two years.

ACCOUNT
UNDERGROUND SUPERINTENDENCE

Year 1924	$13,416.21	Cost Per Ton	.055
" 1925	13,238.74	" " "	.050
Decrease	$ 177.47	" " "	.005

Decrease in the cost due to less working days.

MAINTENANCE COSTS

ACCOUNT
COMPRESSORS AND
POWER DRILLS

Year 1924	$2,432.31	Cost Per Ton	.010
" 1925	514.27	" " "	.002
Decrease	$1,918.04	" " "	.008

This account shows a large decrease as we purchased but very little new equipment in 1925. Two new R.B.10 auger drills were put underground during the year.

MORRIS LLOYD MINE

MAINTENANCE COSTS

ACCOUNT
HAND TRAM EQUIPMENT

Year 1924	$748.25	Cost Per Ton	.003
" 1925	831.60	" " "	.003
Increase	$ 83.35	" " "	.000

The bulk of the cost in connection with this account is the replacement of the roller bearing car wheels for sub level cars. Most of the expense formerly charged to this account is being eliminated by the use of scraping equipment.

ACCOUNT
ELECTRIC TRAM EQUIPMENT

Year 1924	$21,714.16	Cost Per Ton	.088
" 1925	17,727.13	" " "	.067
Decrease	$ 3,987.03	" " "	.021

Large decrease due to the fact that (17) seventeen 36 Cu. Ft. rocker dump cars were charged off in 1924 compared with (10) ten in 1925. We also had less repairs to locomotives in 1925 than during the previous year.

ACCOUNT
PUMPING MACHINERY

Year 1924	$4,531.15
" 1925	4,064.73
Decrease	$ 466.42

The largest item of expense in both years was the cost of a herring-bone gear for the fourth level Prescott pumps. One was bought in 1924 for #1 pump at a cost of $2,380.00. In 1925 a new gear for #2 pump cost $2,190.00. The balance of the decrease is accounted for in that no cable or valves were charged out in 1925.

SURFACE COSTS

ACCOUNT
HOISTING

Year 1924	$16,488.86	Cost Per Ton	.067
" 1925	17,141.86	" " "	.065
Increase	$ 653.00	Decrease	.002

Increase in cost due to larger amount of electric power for hoisting ore. In 1924, 227,170 tons were hoisted compared with 265,829 in 1925. Due to the larger tonnage being hoisted with the same operating force, the decreased labor charges more than offset the increase supply cost so that the cost per ton actually shows a decrease for 1925.

MORRIS LLOYD MINE

SURFACE COSTS

ACCOUNT
STOCKING ORE

Year 1924	$ 9,971.05	Cost Per Ton	.041
" 1925	11,336.34	" " "	.043
Increase	$ 1,365.29	" " "	.002

Cost for 1925 shows an increase due to erecting temporary trestles. At the Lloyd shaft practically all the Lloyddale grade was stocked during the shipping season. Two trestles were erected to handle this ore. At the Morris shaft the demand for Morrisville slumped in 1925 so that a long trestle parallel with the old North Lake Silica pile had to be constructed to stock this grade.

ACCOUNT
SCREENING AND CRUSHING

Year 1924	$1,201.32	Cost Per Ton	.005
" 1925	2,202.95	" " "	.008
Increase	$1,001.63	" " "	.003

During 1925 a new gear and pinion were installed on the crusher. The boiler for the heating plant used in connection with the crusher and screens was repaired. The building housing this equipment was covered with expanded metal lath. There was also an increase in the amount of electric power used due to crushing 25% more ore in 1925.

ACCOUNT
DRY HOUSE

Year 1924	$9,395.29	Cost Per Ton	.038
" 1925	9,622.69	" " "	.036
Increase	$ 227.40	Decrease	.002

Increased due to charging a larger proportion of the cost of operating the water supply system against the dry. The expenditure for labor for the two years is identical, the cost for fuel is less but the latter is more than offset by the increased charge for water.

ACCOUNT
GENERAL SURFACE EXPENSE

Year 1924	$4,461.37
" 1925	4,913.68
Increase	$ 452.31

Increased cost due to surface improvements, mostly labor repairing fences and doing landscape work.

MORRIS LLOYD MINE

MAINTENANCE COSTS

ACCOUNT
HOISTING EQUIPMENT

Year 1924	$6,976.33	Cost Per Ton	.028
" 1925	4,954.11	" " "	.018
Decrease	$2,022.22	" " "	.010

Expense for 1924 was unusually high due to repairs on main switch board following fire. These repairs cost $3,071.12 and a part of this expense was charged against compressor equipment.

ACCOUNT
SHAFT

Year 1924	$1,911.13	Cost Per Ton	.008
" 1925	4,765.78	" " "	.018
Increase	$2,854.65	" " "	.010

Cost for 1925 shows an increase due to repairing bottom of Lloyd shaft following a wreck. Furthermore, all the shaft pockets were equipped with new doors and air lifts to prevent dirt falling down the shaft. A great many new skip runners were also put into both Morris and Lloyd shafts.

ACCOUNT
TOP TRAM EQUIPMENT

Year 1924	$2,778.21
" 1925	2,630.77
Decrease	$ 147.44

Decreased because in 1924 this account was charged with a proportion of the expense of new cables following fire.

ACCOUNT
DOCKS, TRESTLES
AND POCKETS

Year 1924	$ 950.74
" 1925	1,484.36
Increase	$ 533.62

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

ACCOUNT
MINE BUILDINGS

Year 1924	$1,250.35
" 1925	1,194.11
Decrease	$ 56.24

There was no unusual expense in 1925, the only improvement being the expanded metal lath put on to the Lloyd shaft house preparatory to guniting that structure.

MORRIS ILLOYD MINE

GENERAL MINE ACCOUNTS

ACCOUNT
INSURANCE

Year 1924	$123.75
" 1925	126.24
Increase	$ 2.49

Very little change for the two years.

ACCOUNT
ENGINEERING

Year 1924	$3,285.53
" 1925	3,629.02
Increase	$ 343.49

Increased because of better engineering supervision for the year 1925.

ACCOUNT
ANALYSIS

Year 1924	$7,050.65
" 1925	7,435.17
Increase	$ 384.52

Increased because the samples for the Cliffs Group were trucked to Negaunee and the analytical work done at the Negaunee Mine.

ACCOUNT
PERSONAL INJURY EXPENSE

Year 1924	$10,496.84
" 1925	8,738.95
Decrease	$ 1,757.89

Expense for 1924 and 1925 includes a fatality for each year but in addition in the former year, a payment for $1350.00 was made for the loss of an eye to Batista Bertino.

ACCOUNT
SAFETY DEPARTMENT EXPENSE

Year 1924	$237.62
" 1925	220.33
Decrease	$ 17.29

MORRIS LLOYD MINE

GENERAL MINE ACCOUNTS

ACCOUNT
TELEPHONES AND
SAFETY DEVICES

Year 1924	$2,326.60
" 1925	793.87
Decrease	$1,532.73

The expense for 1924 was unusually heavy due to installing fire doors, etc. provided for by E. & A. #444.

ACCOUNT
LOCAL GENERAL WELFARE

Year 1924	$3,000.00
" 1925	2,663.09
Decrease	$ 337.79

These items come from the sociological department and are included in the annual report of that department.

ACCOUNT
MINE OFFICE

Year 1924	$13,452.24
" 1925	11,890.49
Decrease	$ 1,561.75

Mine office expense for portion of the year less than usual due to charging half of superintendent's salary to Land Department. There is also a larger proportion of the superintendent's salary charged to the Barnes-Hecker Mine as that mine increased its forces and production.

BARNES HECKER MINE

PRODUCTION

This property shows a fine increase in production for the year 1925 and at the close of the year was hitting a good stride as the month of December exceeded all previous months in production.

PRODUCTION, TONS PER DAY & TONS PER MAN PER DAY

	PRODUCT	DAILY HOIST	TONS PER MAN PER DAY
YEAR 1923	36,228	122	2.09
" 1924	75,857	258	2.98
" 1925	138,582	482	4.18
DEC. 1925	13,731	597	4.76
NOV. 1925	12,191	581	4.69
OCT. 1925	12,821	583	4.81
SEPT.1925 NOTE*	11,977	570	4.48
AUG. 1925	13,510	540	4.60
JUL. 1925	12,910	497	4.25
JUN. 1925	12,383	495	4.45
MAY. 1925	12,123	485	4.29
APR. 1925	8,268	345	3.10
MAR. 1925	10,355	398	3.64
FEB. 1925	9,042	377	3.52
JAN. 1925	9,271	357	3.39

NOTE* Mine operated six days a week up to September. During last four months of the year, the schedule was five days a week.

PRODUCTION BY GRADES

	TOTAL TONS	BARNES	%	SILICA	%
YEAR 1923	36,228	23,742	65.4	12,486	34.5
YEAR 1924	75,857	58,123	76.7	17,734	23.3
YEAR 1925	138,582	106,905	77.2	31,677	22.8

It will be noted that the percentage of Silica ore hoisted shows a decrease for the past two years although there was no great reduction in 1925. We expect the grade of the ore body to improve with depth and the amount of Siliceous material that will be hoisted in the coming years will undoubtedly show a marked decrease.

BARNES HECKER MINE

SHIPMENTS

We forwarded a total of 124,498 tons of ore to the docks, of which 6,447 tons was Silica grade. 20% of the Cliffs Group mixture was Barnes ore and the sale of 600,000 tons for shipment in 1925, enabled us to get rid of 118,051 tons.

The pocket over-run for the season figured nearly 10%. The ore shipped from the pockets averaged 58.21 Iron and from the stockpile 57.74. The published guarantee was 57.80.

STOCKPILES

STOCKPILE BALANCES AT END OF YEAR

	BARNES ORE	SILICA ORE	TOTAL
YEAR 1923	37,576	2,159	39,735
YEAR 1924	95,699	2,793	98,492
YEAR 1925	84,553	28,023	112,576

DELAYS

DATE	DURATION	CAUSE
JAN. 8th	3 Hrs.	Changing hoisting rope.
" 9th	1 "	Repairing first level locomotive.
" 20th	2 "	Top tram car off track.
" 28th	1¾ "	Repairing first level locomotive.
FEB. 17th	2 "	Top tram car over dump.
" 25th	2 "	Repairing rotary dump.
MAR. 9th	5½ "	No air.
" 24th	1¾ "	Top tram car over dump.
" 26th	3 "	" " " " "
JUL. 30th	3¾ "	Rotary dump being repaired.
SEP. 11th	2¾ "	" " " "
OCT. 19th	16 "	No current.
NOV. 10th	6 "	Top tram car over dump.

With the exception of the delays on March 9th and October 19th, there was no loss of product because the underground chutes had storage capacity enough to keep the miners employed steadily and the accumulated ore was hoisted on the following shift.

BARNES HECKER MINE

ORE RESERVES

STATEMENT SHOWING ORE IN SIGHT DECEMBER 31ST, 1925.

Above	1st	Level	East End	123,492	Tons
"	"	"	West "	13,863	"
"	2nd	"	East "	104,557	"
"	"	"	West "	182,759	"
"	3rd	"	East "	94,337	"
"	"	"	West "	272,238	"
Below	"	"	East "	24,300	"
"	"	"	West "	36,619	"
			Total,	852,165	Tons

SUMMARY OF ORE RESERVES

	NON-BESSEMER (BARNES GRADE)	
Total ore developed	791,246	Tons
" " prospective	60,919	"
Total,	852,165	Tons

The following table shows the results in tons of the development work prosecuted for the past three years. The prospects for additional ore below the present bottom level are very good and the ultimate tonnage that will probably be produced below the third level will no doubt exceed the ore developed to date. There are also good chances of finding additional ore between the second and third levels.

ESTIMATED ORE		1923	1924	1925
In Mine January 1st,	Tons	416,000	462,963	823,562
Product	"	36,228	75,857	138,582
Balance	"	379,772	387,106	684,980
In Mine December 31st,	"	462,963	823,562	852,165
Developed Each Year	"	83,191	436,456	167,185

BARNES HECKER MINE

LABOR

During the early part of the year, we had a great deal of difficulty keeping desirable men. With the introduction of more scraper hoists, enabling the miners to make better pay, we found the men better satisfied and more willing to work steadily. We were full handed the last three months of 1925 and were actually turning men away. The following table shows the size of the crew for the past three years.

TABLE SHOWING MEN EMPLOYED

	SURFACE EMPLOYEES	UNDERGROUND MEN	TOTAL
YEAR 1923	19	37	56
" 1924	21	64	85
" 1925	27	87	114

LABOR COSTS

Although the crew shows an increase for 1925, the labor costs have been steadily declining as shown by the statement that follows:-

	COST FOR LABOR		
	SURFACE	UNDERGROUND	TOTAL
YEAR 1923	.688	1.477	2.165
" 1924	.372	1.211	1.583
" 1925	.250	.906	1.156
DEC. "	.223	.805	1.028
NOV. "	.229	.814	1.043
OCT. "	.220	.787	1.007
SEP. "	.213	.865	1.078
AUG. "	.220	.840	1.061
JUL. "	.234	.901	1.135
JUN. "	.229	.852	1.081
MAY. "	.242	.893	1.134
APR. "	.433	1.091	1.525
MAR. "	.283	1.033	1.316
FEB. "	.288	1.060	1.349
JAN. "	.277	1.122	1.399

NATIONALITIES

The men employed at the Barnes-Hecker property at the close of the year were classified as follows:-

English	27
Scandinavian	7
French	20
Finnish	43
Italians	15
Total,	112

BARNES HECKER MINE.

BARNES HECKER MINE

NEW CONSTRUCTION

We carried on work under two E.& A's during the year; one #464 covering North Lake Drainage and the other #480 providing for a water supply system for the location.

E. & A. #464

In order to decrease the flow of water into the mine, North Lake was pumped out in 1922. Pumping from the low area in the East end of the lake was continued until July 22nd, 1924, when the gallons per minute pumped from underground dropped to 600. The water in the lake was permitted to rise to an elevation of 1502. For four months, no increase in the flow was noticed but by January 1925, the amount of water pumped had gone up 35% so pumping from the Lake was again resumed and has been kept up to date. As this yearly pumping charge amounts to approximately $5000.00, it was decided to dig a new drainage ditch by lowering the bottom of the old Carp River bed and excavating a new channel from a point a short distance West of the Morris shaft to the East end of North Lake.

The new ditch when completed will be 4300 feet in length. In 1924 1600 feet was finished and in 1925, all but 250 feet of the balance was dug.

We suffered several bad delays during the summer which threw the work back over a month. No progress was made after the middle of December due to the weather.

This work is being done under E. & A. #464 and should be completed early in the spring of 1926.

E. & A. #480

This E. & A. covers the installation of a water supply system for the location and fills a much needed want.

The water is secured from two four inch well points driven fifty feet to ledge, the pump having an automatic control keeping the pressure around 60#.

E. & A. #480
(CONTINUED)

The water is pumped into an old boiler, the top portion of which is kept filled with air. As the water enters, the air is compressed and when the pressure rises to 70#, the pump automatically stops, starting up again when the pressure drops to 50#.

The pump requires but little attention and the entire system, including kitchen sinks and cess pools, was installed for $2825.00, which is a little under the estimate.

SURFACE

Nothing new in the shape of improvements was undertaken on surface with the exception of the erection of a new stocking trestle for Siliceous ore. This trestle was run South-east from the shaft parallel with the old rock pile. A new drainage ditch to carry away the water that accumulates in the spring, was dug East of the new Siliceous ore stockpile.

UNDERGROUND

As the opening up of the various sub levels proceeds, we find the ore lenses to be greater than we anticipated. At the top of the East end above the first level, considerable new additional tonnage was proven up during the year. Below the first level near the centre of the main ore body, the ore runs farther South than the drill holes indicated.

The work done during the year in detail is as follows:-

FIRST LEVEL

EAST END:

The top sub at the 1115 foot elevation was worked out and most of the next sub mined. At the West end of this ore area, two gangs had dropped down and were drifting on the second sub below the 1115 foot elevation.

As the mining of the main ore body below the first level will be held up until the ore to the East and above the first level is taken, we put six gangs to work here; two of them having scrapers in order to speed up the mining operations.

BARNES HECKER MINE

UNDERGROUND
FIRST LEVEL
(CONTINUED)

Furthermore, with the same thought in mind, a transfer sub was driven from No. 29 raise, 60 feet below the 1115 foot sub, and three new raises put up so as to make it possible to employ six gangs in this East end and to cut down the length of the tram.

On the West side of the same ore area, contracts Nos. 4 and 13 mined out the ore from the 1030 foot sub to within three subs of the main level.

WEST END:

Contracts Nos. 1, 2, 3 and 14, all equipped with scrapers, have taken out a large tonnage during 1925. These were all good gangs and this territory is dry. As a result, they worked out six sub levels.

SECOND LEVEL

At the West end of the main ore body, a new raise was put and holed near the centre of the West ore body on the first level.

At the extreme East end of the level, a new raise fifty feet East of No. 40 was raised to the first level holing just North of No. 10 raise.

In the central portion of the main ore lens Nos. 33, 34 and 35, all equipped with scrapers, mined out four subs. These three gangs were the most efficient in the mine, their output for the last four months running approximately (22) twenty-two tons per man per shift.

SCRAPERS

The scrapers added during the year account for the lower production costs, increased miners wages and increased tons per man shift.

The hand shoveling gangs were paid $2.32 per car, while the price for the scraping gangs varied from $1.30 to $1.60, depending upon local conditions. The latter gangs usually averaged over $6.00 per day, while the former barely made company account wages.

BARNES HECKER MINE

UNDERGROUND SCRAPERS (CONTINUED)

This is clearly shown in the table that follows. You will please note how the percentage of the total ore scraped has gone up.

MONTH	TONS PRODUCED BY SCRAPERS: TONS	TONS PRODUCED BY SCRAPERS: TONS PER MAN SHIFT	TONS PRODUCED BY HAND SHOVELING: TONS	TONS PRODUCED BY HAND SHOVELING: TONS PER MAN SHIFT	CONTRACTORS RATES: SCRAPING	CONTRACTORS RATES: HAND SHOVELING	PERCENTAGE OF TOTAL ORE SCRAPED
JAN. 1925	4,494	16.05	4,777	6.04	$6.02	$4.85	48.7%
FEB. "	4,257	16.52	4,752	5.93	5.83	4.87	47.9
MAR. "	5,470	16.25	4,798	6.85	6.26	4.88	53.4
APR. "	4,419	17.38	3,590	6.38	6.07	4.83	55.2
MAY. "	7,395	18.55	3,750	6.02	6.50	4.90	66.3
JUN. "	8,894	15.52	2,665	5.66	5.65	4.85	76.7
JUL. "	9,082	21.35	3,115	4.65	6.32	4.82	74.5
AUG. "	9,100	20.87	3,383	5.11	6.52	4.87	72.9
SEP. "	7,832	16.90	3,355	6.27	6.19	4.59	70.2
OCT. "	9,528	16.60	2,393	6.57	5.99	4.61	79.8
NOV. "	9,558	17.70	2,358	5.35	6.02	4.82	80.2
DEC. "	11,540	15.00	1,449	4.43	5.92	4.60	89.2

NOTE:- Two new gangs using scrapers in December had a poor chance to use the new equipment to advantage, because the sub levels were badly cut up with old drifts near the raises. This lowered the average tons per man for all the gangs. The table shows, however, that nearly 90% of the ore produced in December came from scrapers compared with less than 50% in January.

TONS PER MAN PER DAY

We made a marked advance in the tons per man per day during the past year as can be seen by comparing the figures on the table below:-

	TONS PER MAN PER DAY: SURFACE	UNDERGROUND	TOTAL
YEAR 1923	6.10	3.17	2.09
" 1924	11.76	3.97	2.98
" 1925	17.29	5.50	4.17
DEC. "	19.56	6.29	4.76
NOV. "	18.78	6.26	4.69
OCT. "	19.60	6.38	4.81
SEP. "	20.38	5.75	4.48
AUG. "	19.68	6.08	4.60
JUL. "	18.31	5.53	4.25
FIRST SIX MONTHS 1925	15.25	4.96	3.74

BARNES HECKER MINE

WAGES

Due to the increased efficiency of labor employed in 1925, the average wages for the miners also show an increase for the year. The following table shows wages paid miners for the year.

AVERAGE WAGES PAID MINERS

JAN.	1925	$5.15
FEB.	"	5.11
MAR.	"	5.33
APR.	"	5.22
MAY.	"	5.52
JUN.	"	5.28
JUL.	"	5.41
AUG.	"	5.52
SEP.	"	5.38
OCT.	"	5.52
NOV.	"	5.57
DEC.	"	5.54

PUMPING EXPENSE

As mentioned previously, the preater portion of our pumping cost was that in connection with the digging of the drainage ditch.

The maintenance expense of the main pumping plant on the third level was also heavy.

The water pumped from underground steadily decreased until this past year, when mining operations caused the hanging to cave and crack at various points permitting more water to seep into the mine.

YEAR	GALLONS PER MINUTE
1920	261
1921	1113
1922	1044
1923	743
1924	615
1925	713

However, the water is gradually draining off as we were pumping only eighteen hours a day in December compared with twenty-one and one-half hours in March and April.

BARNES HECKER MINE

COST OF PRODUCTION

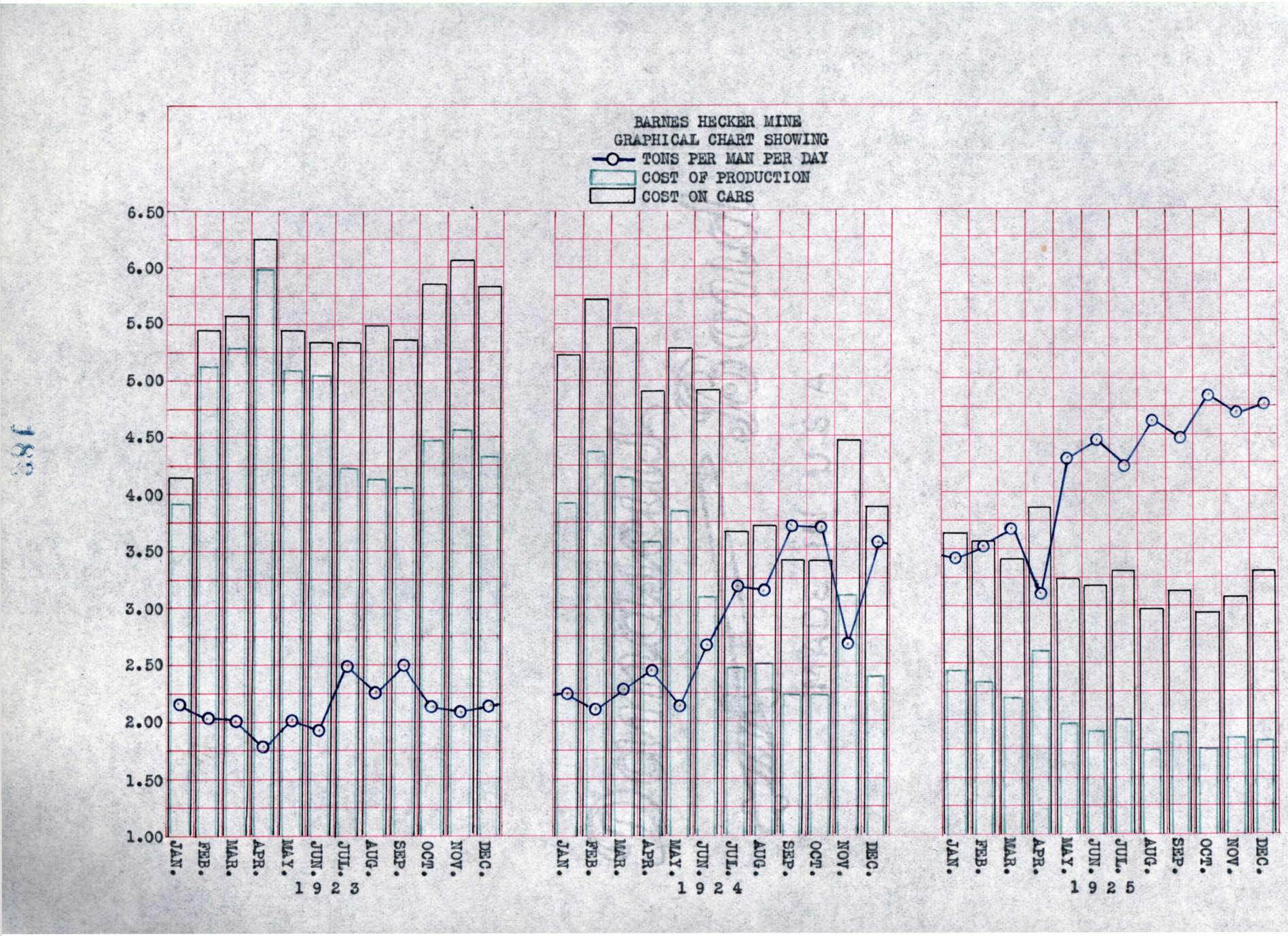
A marked reduction in the cost of producing the ore will be noted when comparing the figures for the past year with those preceding.

It will be noted that the cost of production shows a drop corresponding to the increase in wages to the contract miners. When the cost drops, the compensation to the miners increases due to the increased efficiency of the entire underground organization.

This property shows very clearly the improvement in operating results upon more general adoption of scrapers.

TABLE SHOWING PRODUCTION COST

	LABOR	SUPPLIES	TOTAL
YEAR 1923	2.258	2.331	4.589
" 1924	1.641	1.109	2.750
" 1925	1.177	.797	1.974
DEC. "	1.059	.730	1.789
NOV. "	1.071	.743	1.814
OCT. "	1.033	.691	1.724
SEP. "	1.091	.756	1.847
AUG. "	1.079	.643	1.722
JUL. "	1.139	.841	1.980
JUN. "	1.098	.779	1.877
MAY. "	1.148	.795	1.943
APR. "	1.557	.998	2.555
MAR. "	1.349	.864	2.213
FEB. "	1.397	.893	2.290
JAN. "	1.445	.953	2.398


BARNES HECKER MINE
GRAPHICAL CHART SHOWING
TONS PER MAN PER DAY
COST OF PRODUCTION
COST ON CARS
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
JAN. FEB. MAR. APR. MAY. JUN. JUL. AUG. SEP. OCT. NOV. DEC.
1923
JAN. FEB. MAR. APR. MAY. JUN. JUL. AUG. SEP. OCT. NOV. DEC.
1924
JAN. FEB. MAR. APR. MAY. JUN. JUL. AUG. SEP. OCT. NOV. DEC.
1925

BARNES-HECKER MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1925.

GRADE	IRON	PHOS.	SILICA
Barnes,	58.08	.077	7.85
Barnes Silica,	53.21	.072	15.02

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1925.

GRADE	Mine IRON	Mine PHOS.	Mine SILICA	Lake Erie IRON	Lake Erie MOIST.
Barnes,	(All Mixed)				
Barnes Silica,	(All Mixed)				

ORE STATEMENT - DECEMBER 31ST, 1925.

	BARNES	BARNES SILICA	TOTAL	TOTAL LAST YEAR
On hand January 1, 1925,	95,699	2,793	98,492	39,735
Output for Year,	106,905	31,677	138,582	73,599
Stockpile Overrun,	-	-	-	2,258
Total,	202,604	34,470	237,074	115,592
Shipments,	118,051	6,447	124,498	17,100
Balance on Hand,	84,553	28,023	112,576	98,492
Increase in Output,			62,725	
Increase in Ore on Hand,			14,084	

1925 -- 2-8 Hour Shifts, 6 days per week, Jan. 1st to Aug. 31st, 1925.
2-8 Hour Shifts, 5 days per week, Aug. 31st to Dec. 31st, 1925.

1924 -- 1-8 Hour Shift, 6 days per week, Jan. 1st to May 5th, 1924.
2-8 Hour Shifts, 6 days per week, May 5th to Dec. 31st, 1924.

BARNES-HECKER MINE

SHIPMENTS FOR YEAR-1925.

GRADE	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Barnes,	60,400	57,651	118,051	99
Barnes Silica,	692	5,755	6,447	17,001
Total,	61,092	63,406	124,498	17,100
Total Last Year,			17,100	
Increase,			107,398	

BARNES-HECKER MINE

COMPARATIVE MINING COST FOR YEAR

	1925	1924	INCREASE	DECREASE
PRODUCT	138,582	75,875	62,707	
Underground Costs	1.703	2.347		.644
Surface Costs	.157	.238		.081
General Mine Accounts	.114	.165		.051
Cost of Production	1.974	2.750		.776
Construction Cost		1.000		
Plant	1.001		.001	
Equipment	.0	.001		.001
Taxes	.051	.064		.013
Central Office	.104	.136		.032
Contingent Expense	.081	.059	.022	
Cost Adjustment	.024	.026		.002
Cost on Stockpile	3.235	4.036		.801
Loading & Shipping	.039	.012	.027	
Total Cost on Cars	3.274	4.048		.774
No.Days Operating	288	294		6
No.Shifts & Hours	2-8	1-8-99 2-8-195		
Avg.Daily Product	481	258	223	
COST OF PRODUCTION				
Labor	1.181	1.640		.459
Supplies	.793	1.110		.317
Total	1.974	2.750		.776

BARNES-HECKER MINE

COMPARATIVE WAGES AND PRODUCT

	1 9 2 5	1 9 2 4	INCREASE	DECREASE
PRODUCT	138,582	75,857	62,725	
No. Shifts & Hours	2-8hr.	1-8; 2-8		
AVG.NO.MEN WORKING				
Surface	27	21	6	
Underground	87	64	23	
Total	114	85	29	
AVG.WAGES PER DAY				
Surface	4.33	4.38		.05
Underground	4.98	4.82	.16	
Total	4.82	4.71	.11	
AVG.WAGES PER MO.OF 25 DAYS				
Surface	108.25	109.50		1.25
Underground	124.50	120.50	4.00	
Total	120.50	117.75	2.75	
PRODUCT PER MAN PER DAY				
Surface	17.29	11.76	5.53	
Underground	5.50	3.98	1.52	
Total	4.17	2.98	1.19	
LABOR COST PER TON				
Surface	.250	.372		.122
Underground	.906	1.211		.305
Total	1.156	1.583		.427
AVG.PRODUCT BRK'G & TRM'G	11.69	7.77	3.92	
" WAGES MINERS	5.76	5.57	.19	
" " BRK'G & TRM'G	5.76	5.57	.19	
TOTAL NO. OF DAYS				
Surface	8,012¼	6,448¾	1,563½	
Underground	25,184¾	19,047¾	6,137	
Total	33,197	25,496½	7,700½	
AMOUNT FOR LABOR				
Surface	34688.57	28226.16	6462.41	
Underground	125538.19	91882.66	33655.53	
Total	160226.76	120108.82	40117.94	

Proportion Surface to Underground Men:
1925 - 1 to 3.22
1924 - 1 to 3.04
1923 - 1 to 2.
1922 - 1 to 2.7

1924 - changed from 1-8hr. to 2-8hr shifts May 6th.

BARNES-HECKER MINE.

BARNES-HECKER MINE

TIMBER STATEMENT FOR THE YEAR ENDING DECEMBER 31, 1925.

KIND	LINEAL FEET	AVG. PRICE PER FOOT	AMOUNT 1925	AMOUNT 1924
6" to 8" Timber	48,625	.041	2,028.87	1,377.52
8" to 10" "	81,775	.076	6,234.83	4,179.00
10" to 12" "	19,290	.087	1,670.68	885.32
12" to 14" "	1,392	.096	133.15	527.01
14" to 16" "	0		0	198.06
Total Timber	151,082	.067	10,067.53	7,166.91
	LINEAL FEET	PER 100'		
5" Lagging	527,000	.809	4,266.15	3,651.57
8' "	195,100	.744	1,453.10	611.11
Total Lagging	722,100	.792	5,719.25	4,262.68
Poles	267,240	1.160	3,109.68	2,257.50
Total Lagging & Poles	989,340	.893	8,828.93	6,520.18
5/8" Covering Boards	6,200	1.865	115.66	101.24

Product	138,582	75,857
Feet of Timber per Ton of Ore	1.090	1.471
" Lagging "	5.210	6.971
" " per foot of Timber	4,779	4.74
Cost per ton for Timber	.0727	.094
" Lagging	.0413	.056
" Poles	.0224	.029
" Covering Boards	.0008	.001
" Timber, Lagging, Poles, & Boards	.1372	.181
Equivalent of Stull Timber to Bd.Measure	215,917	182,020
Ft.of Bd.Measure per ton of ore	1.558	2.399
Cost for Timber, Lagging & Poles - 1923		8835.58
1924		13788.33
1925		19012.12

BARNES-HECKER MINE.

BARNES-HECKER MINE

STATEMENT OF EXPLOSIVES USED FOR BREAKING ORE

KIND	QUANTITY	AVERAGE PRICE	AMOUNT 1925	AMOUNT 1924
40% 1¼" L.F.Powder	48,900	.135	6,601.50	4,910.62
Total Powder	48,900	.135	6,601.50	4,910.62
Fuse	194,000	6.377	1,237.20	947.88
Caps	39,400	10.65	419.59	327.07
Cap Crimpers	14	.477	6.68	11.13
Tamping Bags	2,000	4.45	8.90	0
Total Fuse, Etc.			1,672.37	1,286.08
Total Explosives			8,273.87	6,196.70
Product			138,582	75,857
Pounds of Powder Per Ton of Ore			.353	.479
Cost Per Ton for Powder			.0477	.065
" " Fuse, Caps, Etc.			.0120	.017
" " All Explosives			.0598	.082
Avg. Price per Lb. for Powder			.135	.135

BARNES HECKER MINE

ANALYSIS OF COST SHEETS, EXPLAINING INCREASE OR DECREASE IN VARIOUS ACCOUNTS BETWEEN THE YEAR 1924 AND 1925.

UNDERGROUND COSTS

ACCOUNT
DEVELOPMENT IN ORE

Year 1925	$ 4,213.16	Cost Per Ton	.030
" 1924	16,816.26	" " "	.222
Decrease	$12,603.10	" " "	.192

In 1924 the mine was in the development stage and main level drifts as well as development work in the subs was carried on in the ore areas.

ACCOUNT
STOPING

Year 1925	$78,716.90	Cost Per Ton	.568
" 1924	41,965.41	" " "	.553
Increase	$36,751.49	" " "	.015

Although there was a large increase in expenditure, there was little change in the unit cost. The increased unit cost is due to mining the wet ore body above the first level in the East end. The balance of the mine shows increased operating efficiency.

ACCOUNT
TIMBERING

Year 1925	$51,756.20	Cost Per Ton	.373
" 1924	38,295.51	" " "	.505
Increase	$13,460.69	Decrease	.132

Total expenditure shows an increase for 1925. Unit cost shows a big decrease due to larger daily average hoist. The overhead expense, such as timber handlers underground and timber framers on surface, per ton of ore was much lower for 1925. The feet of timber per ton of ore shows a reduction from 1.471 in 1924 to 1.090 for 1925. Lineal feet of lagging per ton of ore was reduced from 6.971 to 5.210. The cost per ton for timber, lagging, poles was reduced from .181 in 1924 to .1372 in 1925.

ACCOUNT
TRAMMING

Year 1925	$20,917.78	Cost Per Ton	.145
" 1924	10,969.51	" " "	.151
Increase	$ 9,948.27	" " "	.006

Increased due to operating second level motor and putting gang of trammers on transfer sub above the first level in the East deposit.

BARNES HECKER MINE

UNDERGROUND COSTS

ACCOUNT
PUMPING

Year 1925	$35,549.55	Cost Per Ton	.257
" 1924	32,992.04	" " "	.435
Increase	$ 2,557.51	Decrease	.178

Increased because cost for electric power jumped from $18,311.85 in 1924 to $21,299.40 in 1925 due to pumping approximately 50,000,000 gallons more water.

ACCOUNT
COMPRESSORS AND
AIR PIPES

Year 1925	$16,034.25	Cost Per Ton	.116
" 1924	9,520.01	" " "	.009
Increase	$ 6,514.24	Decrease	.009

Increased in 1925 due to larger consumption of electric current for air compressor. More air was used because more gangs were using air driven scraper hoists and more drilling machines were operated during 1925.

ACCOUNT
UNDERGROUND SUPERINTENDENCE

Year 1925	$5,779.30	Cost Per Ton	.042
" 1924	5,266.53	" " "	.069
Increase	$ 512.77	Decrease	.027

Increased in 1925 because the mine operated more shifts than in 1924. In the latter year production was confined to one shift for approximately one-third of the year.

MAINTENANCE COSTS

ACCOUNT
COMPRESSORS AND
POWER DRILLS

Year 1924	$362.05	Cost Per Ton	.005
" 1925	89.08	" " "	.001
Decrease	$272.97	" " "	.004

Cost for the year 1925 very low because no new machines were purchased

BARNES HECKER MINE

MAINTENANCE COSTS

ACCOUNT
HAND TRAM EQUIPMENT

Year 1925	$106.42	Cost Per Ton	.001
" 1924	769.24	" " "	.010
Decrease	$662.82	" " "	.009

Decreased because scrapers were substituted for hand tramming equipment in 1925.

ACCOUNT
ELECTRIC TRAM EQUIPMENT

Year 1925	$6,285.86	Cost Per Ton	.045
" 1924	7,214.60	" " "	.095
Decrease	$ 928.74	" " "	.050

In 1924 the main line tracks, trolley wire, bonding etc. was put in on the East end of all main levels. No extensions to main lines were made in 1925.

ACCOUNT
PUMPING MACHINERY

Year 1925	$16,507.68	Cost Per Ton	.119
" 1924	5,812.91	" " "	.077
Increase	$10,694.77	" " "	.042

Cost increased because all the expenses in connection with the new drainage ditch are charged against this account. To date $16,627.09 has been expended on M. & A. #464.

SURFACE COSTS

ACCOUNT
HOISTING

Year 1925	$8,199.27	Cost Per Ton	.059
" 1924	6,738.40	" " "	.089
Increase	$1,460.87	Decrease	.030

Increased power charge from $2,659.50 to $4,152.00 because there was an increase in the product hoisted from 75,857 tons to 138,582 tons. There was also an increased labor charge due to employing cage hoist engineer part time on day shifts in addition to regular engineer. This increased cost was somewhat offset by a decrease of approximately $290.00 in heating expense as very little steam was used to thaw out the skip roads near the collar of the shaft in 1925, due to milder weather.

BARNES HECKER MINE

SURFACE COSTS

ACCOUNT
STOCKING ORE

Year 1925	$4,719.94	Cost Per Ton	.034
" 1924	3,544.63	" " "	.047
Increase	$1,175.31	Decrease	.013

Increased cost due to employing more men on top landing due to using side dump cars. This requires an extra man both day and night shift on stockpile and extra labor shifting tracks.

ACCOUNT
DRY HOUSE

Year 1925	$3,785.38
" 1924	3,757.63
Increase	$ 27.75

Practically no change in the costs of heating or labor for dry house.

ACCOUNT
GENERAL SURFACE EXPENSE

Year 1925	$293.14
" 1924	204.29
Increase	$ 88.75

Small increase for 1925 due to fighting forest fires near the mine in the spring of the year.

MAINTENANCE COSTS

ACCOUNT
HOISTING EQUIPMENT

Year 1925	$1,206.42	Cost Per Ton	.009
" 1924	903.28	" " "	.012
Increase	$ 303.14	Decrease	.003

Repairs to skips in 1925 accounts for this increase.

ACCOUNT
TOP TRAM EQUIPMENT

Year 1925	$1,279.86	Cost Per Ton	.009
" 1924	816.45	" " "	.011
Increase	$ 463.41	Decrease	.002

Increased in 1925 due to charging out 1800 feet new 5/8" top tram rope and repairs to top tram cars.

BARNES HECKER MINE

MAINTENANCE COSTS

ACCOUNT
DOCKS, TRESTLES
AND POCKETS

Year 1925	$2,065.75	Cost Per Ton	.015
" 1924	1,482.92	" " "	.020
Increase	$ 582.83	Decrease	.005

The increase in cost for 1925 accounted for by the construction of a new trestle for stocking Silica ore.

ACCOUNT
MINE BUILDINGS

Year 1925	$262.42	Cost Per Ton	.002
" 1924	564.65	" " "	.007
Decrease	$302.23	" " "	.005

In 1924 garage for truck and oil house was erected. We had no unusual expenses in 1925.

GENERAL MINE ACCOUNTS

ACCOUNT
INSURANCE

Year 1925	$142.99
" 1924	109.16
Increase	$ 33.83

ACCOUNT
ENGINEERING

Year 1925	$1,510.26
" 1924	1,381.85
Increase	$ 128.41

Increase for 1925 due to engineering work done on surface in connection with drainage ditch and new stockpile ground and trestle.

ACCOUNT
ANALYSIS

Year 1925	$2,602.14
" 1924	2,367.36
Increase	$ 234.78

Increased due to more samples taken during the year and also because a part of the laboratory work was done at the Negaunee Mine.

BARNES HECKER MINE

GENERAL MINE ACCOUNTS

ACCOUNT
PERSONAL INJURY EXPENSE

Year 1925	$2,183.29
" 1924	1,070.23
Increase	$1,113.06

Increased because we had more minor injuries in 1925 due to employing more men more days.

ACCOUNT
SAFETY DEPARTMENT EXPENSE

Year 1925	$306.04
" 1924	219.58
Increase	$ 86.46

Increased because a larger proportion of first aid supplies were charged against the mine in 1925.

ACCOUNT
TELEPHONES AND
SAFETY DEVICES

Year 1925	$119.13
" 1924	371.32
Decrease	$252.19

Decreased because in 1924 fire doors were erected on three main levels.

ACCOUNT
LOCAL GENERAL WELFARE

Year 1925	$1,659.12
" 1924	1,510.47
Increase	$ 148.65

ACCOUNT
MINE OFFICE

Year 1925	$5,700.46
" 1924	4,946.03
Increase	$ 754.43

Cost increased because a proportion of superintendent's mileage was charged against the mine office expense; a proportion of chareman's wages and because of the additional number of man-days on the labor statement for the year, a larger proportion of superintendent's salary was charged against the Barnes-Hecker Mine.

Mr. M. M. Duncan, Vice-Pres., & Gen. Mgr.,

Ishpeming, Michigan.

Dear Sir:

I beg to submit the following report of the work done in the Gwinn District for the year ending December 31st, 1925.

The various subjects have been taken up under the following heads:-

GENERAL REMARKS

STEPHENSON MINE

FRANCIS MINE

GWINN MINE

PRINCETON MINE

AUSTIN MINE

GARDNER-MACKINAW MINE

GENERAL SURFACE

ANALYSIS OF COST SHEETS

GENERAL REMARKS.

The product of the Gwinn District Mines for the years 1925 and 1924, was as follows:

	1925	1924	INCREASE	DECREASE
Stephenson Mine,	253,193	247,212 (1)	5,981	
Francis " (2)	0	39,031		39,031
Gwinn " (3)	206	0	111	
Total,	253,399	286,243		
DECREASE, 1925,				32,844

(1) Includes overrun of 5,002 tons from stockpile shipments.

(2) Francis Mine abandoned April 30th, 1924.

(3) Produced from repair work, 111 tons; stockpile overrun, 95 tons.

The following table gives shipments for 1925, and ore in stock on December 31st, 1925:

	SHIPMENTS	IN STOCK DEC.31-1925
Stephenson Mine,	216,089	512,842
Princeton "	13,213	171,081
Gwinn "	980	1,745
Austin "	0	43,233
Francis "	0	403,035
Gardner-Mackinaw Mine,	0	50,562
Total Shipments,	230,282	
Ore in Stock Dec. 31st, 1925,		1,182,498
Ore in Stock Dec. 31st, 1924,		1,159,382
INCREASE, 1925,		23,116

Shipments in 1925 exceeded those of 1924 by only 30,996 tons; in both years they were low. They correspond with shipments in 1908, 1909, 1914, 1921 and 1923, all of which were poor years as far as movement of ore from this district was concerned.

The following statements are included in the report as they give the history of the district in a concise form:

STATEMENT SHOWING TOTAL ORE PRODUCED BY YEARS FROM 1903 TO 1925 - INCLUSIVE.

YEAR	AUSTIN	PRINCETON	STEPHENSON	GWINN	FRANCIS	GARDNER-MACKINAW	TOTAL
1903	1,086						1,086
1904	30,118						30,118
1905	57,210	(a) 8,224) 48,889)					114,323
1906	160,049	175,752					335,801
1907	192,424	174,457	8,333				375,214
1908	197,525	124,346	78,419				400,290
1909	203,129	144,882	142,816				490,827
1910	64,705	115,782	214,500				394,987
1911	145,221	96,670	226,022	537			468,450
1912	115,934	22,567	209,282				347,783
1913	68,259	74,884	255,979				399,122
1914		3,256	214,608	48,389			266,253
1915		122	207,724	127,300			335,146
1916	16,193	145	303,562	144,066			463,966
1917	51,659	(b) 1,106	253,266	161,963	1,778		467,560
1918	1,069	148,265	4,245	155,534	41,535	2,405	353,053
1919	14,896	193,228	2,402	137,847	80,528	69,326	498,227
1920	73	156,746	174,782	96,595	80,056	130,388	638,640
1921		97,150	196,539	63,501	71,075	159	428,424
1922	50,905	74	213,223	(c) 20,085	98,049	0	382,336
1923	82,976	0	247,212	27,334	110,550	0	468,072
1924	0	0	249,428	0	39,031	0	288,459
1925	0	0	253,193	(d) 206			253,399
Total,	1,453,431	1,584,333	3,455,535	983,357	522,602	202,278	8,201,536

(a) On hand when mine was taken over August 1st, 1905

(b) Stockpile shortage.

(c) Stockpile overrun.

(d) One-hundred and eleven tons produced from repair work; ninety-five tons stockpile overrun.

GENERAL REMARKS:

STATEMENT SHOWING SHIPMENTS FOR EACH YEAR FROM 1905 TO 1925 - INCLUSIVE.

YEAR	AUSTIN	PRINCETON	STEPHENSON	GWINN	FRANCIS	GARDNER-MACKINAW	TOTAL
1905	44,653	47,290					91,943
1906	173,182	166,894					340,076
1907	195,950	177,863	6,305				380,118
1908	111,229	36,033	52,588				199,850
1909	125,727	42,935	64,206				232,868
1910	188,587	89,442	225,726				503,755
1911	107,394	28,189	128,839	230			264,652
1912	102,529	162,137	214,386				479,052
1913	107,365	53,477	96,298				257,140
1914	30,491	13,607	93,796	20,159			158,053
1915		17,171	243,458	57,910			318,539
1916	64,521		368,739	143,708			576,968
1917	44,420	150,375	496,712	188,070			879,577
1918	8,533	66,244	75,162	182,541	30,775		363,255
1919	2,334	111,617	1,965	66,666	26,936	32,332	241,850
1920	3,665	153,609	110,924	196,593	34,199	49,051	548,041
1921		23,916	77,077	64,515	16,220	19,889	201,617
1922	5,065	26,145	202,522	26,436	11,437	40,180	311,785
1923	94,553	25,642	74,368	28,529	0	10,264	233,356
1924	0	7,453	186,899	4,935	0	0	199,287
1925	0	13,213	216,089	980			230,282
Total,	1,410,198	1,413,252	2,936,059	981,272	119,567	151,716	7,012,064

STATEMENT SHOWING ORE IN STOCK AT THE CLOSE OF EACH YEAR, FROM 1903 TO 1925 INCLUSIVE.

1903	1,086						1,086
1904	31,204						31,204
1905	43,761	8,923					52,684
1906	30,628	18,681					49,309
1907	27,102	15,275	2,028				44,405
1908	113,398	103,588	27,859				244,845
1909	190,800	205,535	106,469				502,804
1910	66,918	231,875	95,243				394,036
1911	104,745	300,356	185,792	307			591,200
1912	118,150	160,786	180,688	307			459,931
1913	79,044	182,193	340,369	307			601,913
1914	48,553	171,842	461,181	28,537			710,113
1915	48,553	154,793	425,447	97,927			726,720
1916	225	154,793	360,270	98,285			613,573
1917	7,464	3,457	116,824	72,178	1,778		201,701
1918	--	85,478	45,907	45,171	12,538	2,405	191,499
1919	12,562	167,089	46,344	116,352	66,130	39,399	447,876
1920	8,970	170,226	110,202	16,014	111,987	120,736	538,135
1921	8,970	243,460	229,664	15,000	166,842	101,006	764,942
1922	54,810	217,389	240,365	8,649	253,454	60,826	835,493
1923	43,233	191,747	413,209	7,454	364,004	50,562	1,070,209
1924	43,233	184,294	475,738	2,519	403,035	50,562	1,159,381
1925	43,233	171,081	512,842	1,745	403,035	50,562	1,182,498

GENERAL REMARKS:

The Stephenson Mine operated throughout the year on a five-day per week schedule. The Gwinn, Princeton and Austin Mines have been kept in repair so that they can be reopened on short notice. The Gardner-Mackinaw Mine is full of water, but it can be pumped out and operations resumed on several months notice.

There has been plenty of surface labor available throughout the year, but no great excess. No new men are coming in from foreign countries; the available surface labor consists of boys who have attained the age of 18 years, men crippled in mines by accidents, and men, whom by reason of failing health, are forbidden to work underground by the company physician. The majority of the young men go to Iron Mountain to work for Ford. A few miners and other employees have also gone there during the year, but the loss from this cause has not been large.

The district is 23 years old and the early employees are now nearly all past 50 years of age, with a number past 60 years. It is to be regretted that there is not some other source of employment in the district that might absorb some of the older workmen.

On January 1st, 1925, there were 269 men employed in the district; on December 31st, 1925, there were 283, the gain for the year was 14.

There has been a further increase in the number of vacant houses in the district, due to families moving to Iron Mountain. All of the fifty houses at the Gardner-Mackinaw are vacant, in Gwinn there are 39; at the Austin 13 and 9 at Princeton. Some privately-owned houses at Gwinn were rented this fall to lumber jobbers who are operating in the township. All vacant houses at New Swanzy have been rented to men working in the woods.

The five days per week schedule is liked by all the employees, except those having large families, who are having difficulty in paying bills, especially those employed on surface.

The Gwinn County Park was further improved during the year and was enjoyed very much by the local people. The summer was warmer than usual and the

pool was very popular. The people outside of Gwinn are gradually learning of the park and many families spent the day there. Many tourists also stopped over from one day to a week. Tents were again used for temporary bath-houses; it is hoped that permanent bath-houses will be erected next year.

The severe snow storm of October 19th resulted in serious damage to the trees throughout Gwinn. A number of elms were broken; also birch trees and many limbs from the pines. Nearly fifty truck loads were hauled from the streets in cleaning up after the storm.

Due to the shortage of water in the storage basins, on account of the deficient rain fall, the steam turbine at the Central Power Plant was operated from June 16th for the balance of the year. The situation was so serious that the two steam pumps on the 4th Level of the Stephenson Mine were put into commission and operated during November and part of December. The main pumping plant on the Escanaba River was also operated by steam from August 29th for the balance of the year. Large stocks of coal were accumulated; on December 31st, there were 2691 tons at the Stephenson dock and 2947 tons at the Central Power Plant dock. The inventory as of December 31st showed $33,252.33 as the value of fuel on hand, this was approximately $20,000.00 more than the normal supply. At the end of the year the supply of water in the storage basins was not as low as had been expected in September, and the steam turbine at the Central Power Plant was closed down December 31st. The change from steam to electricity for operating the main pumping plant on the Escanaba River was made on December 30th.

STEPHENSON MINE

The mine operated on single shift during 1925, ore, however, was hoisted on both day and night shift. Only a small crew worked at night handling the ore underground and on surface.

The mine was operated five days per week during 1925; it was idle on Saturday.

PRODUCTION BY GRADES FOR THE YEARS 1925 AND 1924.

	1925		1924	
Number of days worked,	258		261	
Grade of Ore:	Per Day Tons	Total Tons	Per Day Tons	Total Tons
Bessemer,			1	270
Stephenson,	599	154,643	695	181,363
Stephenwood,	296	76,504	231 (a)	60,393
Northdale,	79	20,258	18	4,569
Northwood,	7	1,788	11	2,833
Total Ore,	981	253,193	956	249,428
Rock,	89	22,888	60	15,580
Total Ore and Rock,	1,070	276,081	1,016	265,008

(a) Includes stockpile overrun of 5,002 tons.

No stockpile overrun in 1925.

There was a decided increase in the output of Stephenwood grade this year. It was the largest since 1915. This change in grade was due to concentration of work in area near the footwall. The main Stephenson ore body at the bottom of the basin, between the 5th and 6th Levels, lies on a very flat footwall. Quite an area of footwall is encountered on each sub-level, the ore is always high in Phosphorus near the foot. If mining can be increased in the Northeast ore body, where the footwall is steep, ore running low in Phosphorus will be produced and the output of Stephenwood will show some decrease. The production of this grade depends, therefore, entirely on the number of gangs mining in the main Stephenson ore body near the foot.

SHIPMENTS BY GRADES FOR THE YEARS 1925 AND 1924.

	1925	1924	INCREASE	DECREASE
Stephenson,	205,167	116,633	88,534	
Stephenwood,	5,800	64,992		59,192
Northdale,	5,122	2,909	2,213	
Northwood,	0	2,365		2,365
Total,	216,089	186,899		
INCREASE, 1925,			29,190	

STOCKPILE BALANCES FOR THE YEARS 1925 AND 1924.

	1925 TONS	1924 TONS	INCREASE TONS	DECREASE TONS
Stephenson,	406,178	456,702		50,524
Stephenwood,	80,200	9,496	70,704	
Northdale,	24,212	9,072	15,140	
Northwood,	2,256	468	1,788	
Total,	512,846	475,738		
INCREASE, 1925,			37,108	

The product by months for the years 1925 and 1924, was as follows:
(Includes ore from both the Stephenson Lease and C.& N.W.Ry.Co., Lease, Sec.29)

	TONS 1925		TONS 1924	INCREASE 1925	DECREASE 1925
January,	20,696		25,299		4,603
February,	20,028		23,383		3,355
March,	22,288		21,088	1,200	
April,	20,401		22,524		2,123
May,	20,312		25,322		5,010
June,	22,098		23,449		1,351
July,	23,202		22,447	755	
August,	22,076		17,380	4,696	
September,	19,715	(a)	14,611	5,104	
October,	21,728	(a)	15,948	5,780	
November,	19,389	(b)	13,035	6,354	
December,	21,260		19,940	1,320	
Total Ore,	253,193		244,426	8,767	
Rock,	22,888		15,580	7,308	
Total Hoist Ore and Rock,	276,081		260,006	16,075	
Average Monthly Product,	23,007		21,667	1,340	

(a) Product low account cave on Southwest side of the mine.
(b) " " " loss of time by miners.

Stockpile overruns not included in this table.

DELAYS ON ACCOUNT OF ACCIDENTS TO EQUIPMENT

The first delay for the year occurred on June 26th, due to the motor on the compressor being out of commission for four hours, from 8:00 A.M., to 12:00 A.M., during which time there was no air for drilling. This effected the hoist on the 26th and also on the 27th, the loss of product on these two days amounted to 150 tons.

The second delay for the year occurred on August 31st, and was due to the breaking of a clevis on one of the skips. The skip was spotted at the 6th Level pocket and in dumping a car of rock into the skip, a large chunk struck the clevis, breaking it and releasing the hoisting rope from the skip. The skip-pit pocket was only a few feet below this point, so that the skip merely settled down without damage on the ore which was in the skip-pit pocket. A new clevis was put on and hoisting resumed after a delay of two hours. The loss of product amounted to 160 tons.

The third delay for the year occurred on September 1st at 10:00 A.M., and was due to breaking of the clevis that had been put on the skip the previous day. The clevis broke when a car of wet ore was dumped in the skip when it was spotted at the 5th Level pocket. The wet ore went through the pocket into the skip in a mass, the strain causing the clevis to break, and the skip fell to the bottom of the shaft, a distance of 80 feet. The skip-pit pocket at the bottom of the shaft was completely wrecked, the skip was only slightly damaged. This clevis was an old one that was on an idle skip on surface. The iron in it was crystallized; it broke when the mass of wet ore struck the skip. The mine was idle from 10:00 A.M., September 1st to 8:00 A.M., September 3rd. The loss of product amounted to 1,860 tons.

The total loss of product due to accidents to equipment amounted to 2,170 tons for the year, the total delay amounted to twenty-eight hours.

DELAYS FROM LACK OF CURRENT.

The mine was idle October 19th, 20th and 21st, due to breaking of the transmission line between Ishpeming and Gwinn, due to the storm of October 18th. The electric current was off from Sunday night, October 18th until 6:00 o'clock P.M., on the 21st. Two hundred and twenty tons of ore were hoisted on the night of the 21st. The loss of product for the three days was 2,660 tons. In order to make up for the time lost by the men, the mine was operated on Saturday, October 24th and on Saturday, October 31st, so that there was only a loss of one day, with a product loss of 740 tons.

It was very fortunate that the steam turbine was in operation when the transmission line broke, as sufficient current was being made to operate the pumps at all of the mines in the district. It would have taken at least twelve hours to get steam up and the turbine going, if the power plant had been idle.

ESTIMATE OF ORE RESERVES.

The ore reserves on December 31st, 1925, were as follows:-

	STEPH. BESS.	STEPH. NO.1	STEPHEN-SON	STEPHEN-WOOD	TOTAL
Ore above 1st Level,			4,858		4,858
" " 4th "			14,042	2,446	16,488
" " 5th "			41,595	19,051	60,646
" " 6th "	20,000	20,000	158,781	70,746	269,527
TOTAL DEVELOPED ORE,	20,000	20,000	219,276	92,243	351,519
Prospective Ore,	_____	_____	57,489	28,744	86,233
GRAND TOTAL ORE, STEPH. LEASE,	20,000	20,000	276,765	120,987	437,752
DECREASE - 1925,					163,037

The product from the Stephenson Lease, Section 20, in 1925, was 231,147 tons. The decrease in ore reserves was 163,037 tons, therefore, 68,110 tons was developed during 1925.

The following table shows division of ore into available and unavailable:

DEVELOPED ORE:	TONS AVAILABLE	TONS UNAVAILABLE	TOTAL TONS.
Ore above 1st Level,		4,858	4,858
" " 4th "	4,893	11,595	16,488
" " 5th "	51,325	9,321	60,646
" " 6th "	176,408	93,119	269,527
TOTAL DEVELOPED ORE,	232,626	118,892	351,519
PROSPECTIVE ORE:			
Ore below 6th Level,	43,116	43,117	86,233
GRAND TOTALS,	275,742	162,010	437,752
DECREASE, 1925, TOTAL ORE,			163,037
" " AVAILABLE ORE,			176,881

This year it is assumed that only 40% of the ore above the 6th Level in the Northeast ore body can be mined. For many months an effort has been made to bring the water, that now comes in at the top of this ore body on the 2nd sub below the 4th Level, down to the 5th Level. To date, this work has not been successful. Mining has been started under the hanging, 32 feet below the 5th Level, even here the ore is quite wet. Mining will be continued under the hanging all the way down to the 6th Level if water conditions will permit. This may bring the water down, and release for mining the ore above a point 32 feet below the 5th Level. Below the 6th Level, it is assumed that 50% of the ore can be mined. The hanging flattens on the 6th Level so that ore mined below this point will be under new hanging. It is expected that 50% can be mined here before the product decreases to a point that there will no longer be a profit on the ore. It might also be stated that trouble from water is not considered likely during the removal of 50% of the ore below the 6th Level.

During 1925 mining has been continued in the ore above the 5th Level at the Southwest end of the Stephenson ore body. This ore was developed prior to the flood in 1917, it lay idle until in the summer of 1924, when mining was resumed. This area will soon be exhausted above the 5th Level. Below the 5th Level only a portion can be mined due to water conditions. The incoming water in a comparatively small area amounts to over 1,600 gallons per minute, making mining operations here impossible. Unless the water comes in at a new place, part of the Southwest side of the Stephenson ore body below the 5th Level will be unavailable.

The total available ore, 275,742 tons, represents a life of less than two years at the present rate of production. However, production from the C. & N. W. Ry. Co., Lease will gradually increase with the opening of the 7th Level, "Auxiliary Shaft". Some additional ore will probably be developed on both leases, so that the life of the mine will be extended. Due to high pumping costs and other expenses on account of operating only one mine in the district, it will not be profitable to operate very long with a decreasing product. The opening of sub-levels in the remaining ore areas after 1926 will necessitate rock drifting on every sub-level from raises to the ore body, another factor that will increase the cost of production.

Due to the above factors it is estimated that the Stephenson Mine will probably operate for two years or more, barring the possible flooding of the mine.

The estimated tonnage on the Stephenson Lease, sub-divided as required by the Tax Commission, is as follows:-

Bessemer Ore:			
Developed:	1. Stephenson Bessemer,	10,000 tons	
	Total Bessemer Ore,		10,000 tons.
Non-Bessemer Ore:			
Developed:	1. Stephenson No. 1,	10,000 "	
	2. Stephenson,	120,383 "	
	3. Stephenwood,	92,243 "	
Prospective:	1. Stephenson,	28,744 "	
	Stephenwood,	14,372 "	
	Total Non-Bessemer Ore,		265,742 "
	Grand Total,		275,742 "

GENERAL

Labor:

There has been no shortage of surface labor during the year. The quality of the available supply was poor during the summer months. The closing of the Gwinn District crushing plant in November released a good crew who took the places of men temporarily employed during the summer.

There was a slight shortage of company account men at times during the summer. This slowed up the work of cleaning tracks and ditches, but did not effect the product.

There was a shortage of miners in November, due to sickness and time lost on account of the deer hunting season. During the entire year there has been a shortage of one gang or more of miners every day. This was due to sickness and to men losing time from various other causes. As a general rule this did not effect the product as the vacant places were filled with company account men or men taken from rock work. The number of names on the payroll was always higher than the number actually working full-time.

E. & A. NO. 474 - ADDITIONAL PUMPING EQUIPMENT - STEPHENSON MINE.

This E. & A. provided for additional pumping equipment for the 6th Level pumphouse, releasing one plunger pump for the 8th Level, "Auxiliary Shaft" pumping plant. It also provided for boiler-head seals for segregation of the 6th and 8th Level plants.

Two, 750-gallon per minute centrifugal pumps, with automatic starting and stopping devices, were purchased and installed in the 6th Level pumphouse. These two pumps have operated automatically, as required to keep the water in the sump down to a pre-determined point, in connection with a 1,000-gallon centrifugal pump that runs all the time. Three pumpmen were required per day prior to this installation; since that time, one pumpman does the necessary oiling and inspection.

The 1,000-gallon plunger pump formerly in the 6th Level plant was dismantled and moved to the 8th Level "Auxiliary Shaft" pumphouse, where it was installed. This pump is operated for a short time each day, when the mine works;

owing to the small amount of incoming water it is not necessary to pump this sump out when the mine is idle on Saturday and Sunday.

The boiler-head seals, set in concrete, have been installed in the entrance to the 6th Level and 8th Level pumphouses. This provides segregation for the 6th Level pumping plant until the water reaches the 5th Level, and for the 8th Level plant until the water has risen to the back of the 7th Level.

The "E. & A"., provides for installation of an auxiliary pump in the 8th Level pumphouse. It is planned to install a 2,000-gallon per minute centrifugal pump, now used in pumping water from North Lake, as soon as it is released. This pump will be available in a few months, when the drainage ditch, now under construction, is completed.

SCRAPERS.

The year 1925 marked the introduction of scraper outfits into a number of working places. At the end of the year thirteen gangs were using them. The output from these gangs in December, (21% of the total gangs on ore) amounted to over 40% of the product. Unfortunately, conditions in the Stephenson do not permit of using scrapers in all the contracts, mainly on account of water in the ore. Under average conditions it is safe to figure on an increase of from 50% to 100% in the output from each gang using a scraper outfit. Two more outfits have been purchased and more will be bought if operating conditions warrant. Due to the extensive rock work underway during the latter part of 1925, it would have been impossible to maintain the product and average cost of production if the scrapers had not been introduced. The life of the mine will be extended several months due to the scrapers, and the product will be larger during the intervening time. In other words, a given product can be obtained from a smaller number of gangs using scrapers, therefore, the output can be maintained from a smaller working area.

WATER CONTROL - UNDERGROUND.

Some further work was done early in the year to get the water to enter

the mine near No. 66 Diamond Drill hole, but it was unsuccessful and it was then decided to entirely abandon this work. All equipment in the raise was removed late in the year and preparations were underway to put a concrete dam in on the 6th Level by-pass drift so that this area can be sealed off from the rest of the mine if necessary. The only reason for stopping the water here would be in case of flood or accident to the transmission lines that would shut down the mine pumps for several days. The incoming water amounts to 125 gallons per minute; under the conditions mentioned above, it might be of great benefit to eliminate this amount of water.

STEPHENSON SURFACE.

D. 1 - BUILDINGS, REPAIRS:

Office and Warehouse:

The posts, sills and joist under the rear of the warehouse rotted, and the rear part of the floor of the warehouse settled nearly six inches. The floor was jacked up, new sills and joist put under this section on 12" x 12" fir posts, which were set on concrete slabs.

The steam and water lines under the office and warehouse were taken out and new pipe installed. All the pipe was covered and enclosed in new wooden launders.

The interior of the office was repainted and some additional shelves installed.

Captain's Office:

In the fall, new steam and water lines were installed in the Captain's office, replacing old lines that were rusted through. The new lines were covered and placed in a wooden launder.

Engine and Boiler House:

All the old abandoned steam, water and air lines were removed from the basement. The walls were given a coat of white water paint.

On account of running the steam pumps underground in the fall, due to the shortage of electric current, considerable work was necessary to get the boiler plant and steam line to the shaft in condition. The old steam line was leaking badly and it had to be dug up, new pipe installed in new wooden launder and pipe covering put on. New steam lines to the office and warehouse and Captain's office were also laid in the new launder.

The steam header had been dismantled on account of operating one boiler for the heating plant. The header was connected up again, valves repacked, steam lines in building covered where old covering was gone, and everything

put in good condition, before two of the boilers, used for high pressure steam, were fired up.

Dry:

One of the two water heaters in the dry rusted through in a number of places, so that repairs were impossible. A water heater from the Francis Mine was installed. The water heaters would not pass through the door of the dry and when the brick wall was torn down to get the old one out and the new one in, a permanent frame and door was installed here so that the heaters could be removed from the building at any time.

The Johns-Manville roofing on the dry, loosened in the joints, due to rusting and breaking of the nails. New strips of 3-ply rubberoid were put over all the joints, and were nailed down with galvanized nails.

Necessary repairs were made during the year to the steam and water lines, shower baths, etc.

Timber Tunnel:

The timbered part of the tunnel from the timber yard to the shaft, broke in under the road and repairs were started. The old timber was found to be so badly rotted that nearly all of it had to be replaced with new timber. This proved quite a job, especially under the pocket track near the shaft. The whole tunnel is close-timbered, so that considerable new timber was required. The total expense of this work was $568.72.

Shaft House and Pockets:

The steam lines to the landing on the shaft house were repaired and where needed, new heaters were installed. Necessary repairs were made to the sliding doors enclosing the landing. New permanent chutes from the pockets to the top of cars were built on the pockets. These permit railroad cars to be loaded exactly in the center, no matter whether the ore is wet or dry. They have decreased cleaning on sides of railroad track, increased the capacity of cars and removed all complaint of cars being loaded too much on one side.

Permanent Trestles:

All needed repairs to permanent trestles were made during the year. Due to extensive repairs made in 1923 and 1924, very little repairs were necessary in 1925.

Stocking, or Portable Trestles:

There was very little expense for trestles until in November, other than the cost for repairs and dismantling on account of loading ore from stockpile. In November thirty-one bents, averaging 40 feet in height, were erected on the Stephenson stocking trestle. This trestle was extended 100 feet to the South on C. & N. W. Ry. Co., Lease, Section 29, to provide for stocking "Northdale" ore. Considerable sollar had to be laid to get this ground ready for stocking.

The Stephenwood stocking trestle in the pit North of the rock pile was raised several times during the fall and early winter. The ore pile here is now 60 feet in height and over 70,000 tons of ore have been stocked from this short trestle. When the original stockpile was made in this pit, filling it to capacity, 73,000 tons of ore were stocked by side-dumping from a gravity tram. The pit is now only partially filled and it is expected that over 100,000 tons can be stocked here by side-dumping from the present trestle. It cannot be raised much higher, as the grade is now near the limit of the power of the motors pulling the tram car.

A part carload of 4" fir was purchased to provide ties for side-dumping on stockpiles this winter. These planks are mostly 10" and 12" wide; they provide a broad surface on the ore piles, have sufficient thickness for railroad spikes used with 40-lb. rail and thus prevent derailments. The damage to top tram cars is usually very serious when a car goes over the high piles, following derailment.

Permanent Tracks to "Stephenwood" Stockpile in Pit.

In loading out the old "Stephenwood" stockpile in 1923 and 1924, considerable trouble and expense was incurred in providing tracks for hauling the ore out of the pit. The steam shovels worked on ore leaving about 8 feet to 12 feet of ore in the bottom of the pit. The loading tracks had to be shifted again and the steam shovel operated on 4 feet of blocking to get this ore out. A fill for a permanent track leading around the side of the pit on a good operating grade was constructed and the tracks were installed. The cost of grading was paid by the mine; the Railroad installed the tracks. Two cargoes of "Stephenwood" were loaded during 1925, one prior to construction of permanent tracks and one afterwards. The shovel now loads from the bottom of the pile and all of the ore is removed as each cut is taken out.

D. 2 - STOCKPILES:

The stocking situation at the Stephenson Mine is more complicated than at any time, since the mine was opened. On December 31st, 1925, there was in stockpiles, 406,178 tons of Stephenson ore, 80,200 tons of Stephenwood, 24,208 tons of Northdale and 2,256 tons of Northwood, a total of 512,842 tons. Part of this ore was stocked with the skip capacity figured at 3.75 tons and part at 4 tons capacity. It is considered safe to figure an overrun of 10%, or 51,284 tons. The total ore in stock is, therefore, 564,126 tons. If to this be added the output for the first four months of 1926, it will bring the total to approximately 650,000 tons.

The situation is decidedly serious and must be given attention by the sales department. It is not so much the total tonnage as the fact that four grades must be stocked that makes it imperative to clean up some of the stockpiles. Sales of 200,000 tons of Stephenson ore in 1926 will not relieve the situation to any extent. Sales of this grade should be not less than 300,000 tons, and in addition, part of the Stephenwood, Northdale and Northwood should be sold. Arrangements should be made for including Northdale ore in Stephen-

son cargoes, as there is now no appreciable difference in physical character, or in analyses. Also, Northwood ore should be included in Stephenwood cargoes. This will take care of ore hoisted during the shipping season, and also make it possible to clean up several small piles of this ore on the stockpile grounds, that otherwise will interfere with loading Stephenson ore.

D. 3 - OPEN PITS:

The caves above the Stephenson ore body have been surveyed during the year. No extensions occurred. The crack above the area that caved in September, 1924, has opened slightly and the ground over this area has settled.

D. 4 - SURFACE:

Measurements of the water level in several standpipe holes on Sections 20 and 29, adjacent to the mine, have been made during the year. The following table gives a record of these measurements:

	No. "W"	No. 54	No. 59	No. 61	No. 48
Elevation of ledge,	999.00	1066.00	959.00	949.00	1109.00
Dec. 5th, 1924,	1064.90	1070.20	1062.90	1056.90	1114.40
Jan. 8th, 1925,	1064.60	1067.90	1062.70	1056.60	
Apr. 9th, 1925,	1064.30	1067.90	1062.30	1055.80	1112.30
June 18th, 1925,	1063.90	1067.50	1061.80	1055.30	1111.70
Aug. 25th, 1925,	1063.90	1067.40	1061.90	1055.20	1111.50
Sept. 28th, 1925,	1063.50	1067.40	1061.50	1054.80	1111.10
Nov. 16th, 1925,	1063.30	1067.20	1061.10	1054.50	1111.00
Dec. 22nd, 1925,	1063.20	1067.40	1061.10	1054.30	--
Net change, 1925,	Lowered 1.70 ft.	Lowered 2.80 ft.	Lowered 1.80 ft.	Lowered 2.60 ft.	Lowered 3.40 ft.
" " 1924,	1.30 ft.	Raised 0.50 ft.	1.80 ft.	2.50 ft.	1.40 ft.
" " 1923,	0.30 ft.	2.50 ft.	0.50 ft.	0.40 ft.	0.80 ft.
" " 1922,	3.60 ft.	Lowered 0.20 ft.	1.70 ft.	2.50 ft.	No reading

The year 1925 was an unusually dry year and this doubtless accounts for a part of the decrease in the water level in these standpipe holes. Some of it was doubtless due to the lowering of the hydraulic gradient on account of pumping from the mine. The water pumped from the mine averaged higher in gallons per minute for the 12 months of 1925, than in 1924. The increase occurred in September, 1924, and it is not yet back to the average pumped prior to September, 1924.

E-1. DEVELOPMENT:

During the year there was a total of 1,931 feet of rock drifting in the Stephenson Mine. (Includes rock work on Stephenson Lease, Section 20, and C. & N. W. Ry. Co., Lease, Section 29).

The following table gives division by levels, etc:

All sub-levels,	493 feet
5th Level,	43 "
6th Level,	396 "
7th Level,	338 "
Raise, 7th Level to 6th Level, for timber road,	30 "
8th Level,	29 "
Raise, 8th Level to 7th Level, for timber road,	90 "
* 8th Level Pump-house,	79 "
* 8th Level Sump,	313 "
	1,931 "

* Not included in totals on cost sheets.

Total rock raising during the year,	713 "
Grand Total rock raising and drifting,	2,650 "

To balance these figures with the figures on the cost sheet it is necessary to deduct 392 feet rock drifting, covering rock work in the 8th Level pumphouse and sump, leaving a total of 2,252 feet for the year. This compares with a total of 1,584 feet in 1924, and 1,577 feet in 1923.

It shows an increase of 668 feet of rock work in 1925, exclusive of 392 feet in pumphouse and sump.

The rock work on sub-levels covers drifting in rock from raises to ore bodies, and short drifts through rolls in the hanging or the footwall.

The principal development work on the main levels was confined to the driving of haulage drifts on the 6th and 7th Levels. The 6th Level drift was located in the footwall under the Southeast ore body and the ore between the 5th

and 6th Levels will be handled through raises that have been put up from this drift.

The 7th Level haulage drift has been driven in the footwall on C. & N. W. Ry. Co., Lease, Section 29. The portion driven in 1925 will be utilized in the mining of the ore on C. & N. W. Ry. Co., Lease, Section 29. This drift will be extended in 1926, for mining the ore on Section 29 and also the Southeast ore body on the Stephenson Lease. The rock from this drift is hoisted through the Auxiliary Shaft to the 6th Level, loaded in tram cars again, taken to the Stephenson shaft and hoisted to surface. From this drift, one raise has been put up to the 6th Level, one raise to the 5th sub below the 6th, and three other raises were being put up to the 6th Level at the end of the year.

A raise for handling timber from the 6th to the 7th Level, also for a traveling road between these levels, was started in December, 1924 and completed in January, 1925. It was put up in granite on an angle of 45°. Timber is sent down on a mine truck, being lowered by a small air hoist on the 6th Level. A stairway has been installed in the traveling road instead of ladders.

A similar raise was put up from the 8th to the 7th Level in 1925, holing near the foot of the raise to the 6th Level. Timber and other supplies can be lowered from the 6th to the 8th Level on a timber truck without transfer.

A pumphouse was excavated on the 8th Level large enough for two pumps. A sump of 150,000 gallons capacity was excavated nearby. Both the pumphouse and sump are located in hard granite.

Rock raising during the year totaled 713 feet. The greater part of this work was done during the latter part of the year, in developing the Southeast ore body on Stephenson Lease, Section 20, and the ore body above the 7th Level on C. & N. W. Ry. Co., Lease, Section 29.

In addition to this work, two raises were put up in No. 3 crosscut on Stephenson Lease for the purpose of trying to cut off the water on the Southwest end of the main Stephenson ore body.

STEPHENSON LEASE, SECTION 20.

Work has been done during 1925 on the following sub-levels and main levels:-

4TH SUB BELOW 3RD LEVEL
FOURTH LEVEL
1ST, 2ND, 3RD AND 4TH SUBS BELOW 4TH LEVEL
FIFTH LEVEL
1ST, 2ND, 3RD, 4TH, 5TH AND 6TH SUBS BELOW 5TH LEVEL.
SIXTH LEVEL.

4TH SUB BELOW 3RD LEVEL:

Mining started on this sub-level in June, 1924, and was finished in October, 1925. Approximately 15,000 tons of ore was mined here in 1925. The area mined comprised the pillar left to support the haulage drift to the shaft on the 4th Level.

FOURTH LEVEL

The pillar left on the 4th Level to support the haulage drift to the shaft was nearly all mined during 1925. At the end of the year it was estimated that the three small pillars near the footwall, remaining to be mined, contained 4,893 tons of ore. During the year, about 16,000 tons of ore was mined here. Scrapers were used by several gangs with excellent results. The ore surrounding the pillar mined this year was removed many years ago and the old cave was on three sides of it, This increased the back and side pressures and it was necessary to mine the ore rapidly to avoid retimbering the drifts. The scrapers decreased the cost of production from this area fully one-third.

At the Southwest side of the 4th Level there are 11,595 tons of ore in six pillars that were left to support the capping. This ore is unavailable until the ore in the mine is practically exhausted, as the mine launder and part of the stockpile ground is directly above. It may be feasible to take out part of this ore just before the mine closes down.

1ST SUB BELOW 4TH LEVEL:

At the Southeast end of the deposit a small pillar of ore on this sub-level was mined early in the year. All other ore in this part of the sub-level had been mined prior to 1921 when there was a sudden increase in the water that stopped all work in this territory. The water came in on the 2nd sub below the 4th Level so that there was no water to interfere with mining on the 1st sub. The pillar mined was 10 feet in width by 60 feet in length.

Mining work was started in the pillar left to support the haulage drift to the shaft, (700 feet East of the shaft) in April, when a rock drift was driven in the footwall for a timber road. In June, two contracts opened out from the 5th Level raises for mining. In July, they started to use scrapers and continued using them for the balance of the year. The pillar left to support the 4th Level haulage drift to the shaft was approximately 150 feet wide and 200 feet long. At the end of the year it was estimated that there were 13,948 tons of ore remaining to be mined on this sub-level.

At the Southwest end of the Stephenson ore body there are two pillars, estimated to contain 6,351 tons of ore, that have been left to support the launder carrying mine water on surface. A portion of these pillars may be mined just before the mine closes down.

2ND SUB BELOW 4TH LEVEL:

In September, 1924, mining of seventeen small pillars was started at the Southwest end of the Stephenson ore body near the C. & N. W. Ry. Co., Sec. 29 Lease. These pillars were left on this sub-level when the mine was flooded in December, 1917, and were unavailable until the cave in September, 1924, diverted the incoming mine water to a point below the 5th Level. Mining was continued during the balance of 1924, and for ten months in 1925. Considerable more ore was found here than had been anticipated due to irregularities in the hanging; the ore in the pillars varied from 10 feet to 18 feet in thickness.

All of the ore on the 2nd sub below the 4th Level has now been mined except the pillar left to support the haulage drift to the shaft on the 4th Level,

containing 17,221 tons and a small pillar, unavailable on account of water, at the Southeast end of the Stephenson ore body.

3RD SUB BELOW 4TH LEVEL:

Mining was started in the pillars left on the Southwest end of the Stephenson ore body near the C. & N. W. Ry. Co., Lease, Section 29, in September, 1924, and was practically completed in December, 1925. These pillars were unavailable, on account of water, until the cave of September, 1924, that diverted the incoming mine water further to the East. It is possible that a small tonnage may later be found on this sub-level further to the West, under the floor of the sub-level above. The footwall has cut off the ore at all points, ore may be found, however, as there is some evidence to indicate a roll or trough in the footwall that can be reached after drifting about 80 feet in rock. This exploration work will be done early in 1926. It is estimated that nearly 16,000 tons of ore was mined here during 1925. This ore ran high in Iron (62% or better) and about .100 in Phosphorus. It was harder than the general run of Stephenson ore and more drill holes and more powder was required in mining.

At the Southeast end of the Stephenson ore body, a drift was driven on this sub-level early in 1925, a distance of 125 feet in ore. It was located at the West end of the ore body that is considered unavailable at this time on account of water. The ore was only a little wider than the drift and most of it was removed by robbing back along the sides of the drift. As the mine water comes in at a point farther to the East it is hoped that this much of the ore body can be mined and kept free from water. It is considered that the balance of the ore on this sub-level, approximately 6,000 tons, is unavailable until the mine water that now comes in on the 2nd sub below the 4th Level has been diverted to the 5th Level.

The pillar left on this sub-level to support the haulage drift to the shaft on the 4th Level, is quite small, as it is cut off by the footwall. It is estimated that it contains 5,791 tons, all of which can be mined.

4TH SUB BELOW 4TH LEVEL:

A pillar had been left at the Southwest end of the Stephenson ore body on this sub-level since 1917, near the point where the water came in that flooded the mine. The change in location of this water, following the cave in September, 1924, made it possible to mine this ore. Development of this sub-level was started in January, 1925, and mining continued throughout the year. At the end of the year the area remaining to be mined was small and only three contracts were working here. It is estimated that there are 6,774 tons remaining to be mined on the Stephenson Lease. A small part of the pillar, containing less than 2,000 tons, extends over on C. & N. W. Ry. Co., Lease, Section 29.

In 1924, a drift was driven on this sub-level at the Southeast end of the Stephenson ore body in an effort to cut off the water that enters the mine at this point. This water comes in on the 2nd sub below the 4th Level and if this work had been successful it would have released this area for mining between the 4th and 2nd sub-levels. Loose ground was encountered in the breast of the drift after it had advanced 180 feet, and it was not possible to advance further. Some water came in (probably 50 gallons per minute) through the loose ground, but this was only a small part of the water that comes in further to the East.

In 1925, after mining out the ore on the 3rd sub below the 4th Level, for a distance of 125 feet, a similar area was mined on this sub-level. The drift referred to in the previous paragraph was driven along the hanging; the balance of the ore over to the footwall was mined in 1925. More water now comes in here and it will have to be cut off before mining can be done on lower sub-levels.

A raise was put up from the 5th Level crosscut, 100 feet West of the area referred to in the previous paragraph, early in the year, to the elevation of this sub-level, and a drift driven across the ore body to the hanging. One cut was blasted to the West along the hanging, when the drift caved. Water,

STEPHENSON-LEASE SECTION 20. E-1, 2, 3:

ore, and rock filled the sub-level and came down the raise and extended out some distance on the 5th Level. This material was cleaned out on the 5th Level and several other caves have since occurred. The object of the work done here (to bring the water from the 2nd sub below the 4th Level, down to the 5th Level) has not been attained, due to the caved material packing tightly and damming back the water. It appears that it is virtually impossible to get the mine water to come in where all necessary preparations have been made to handle it.

In December, a drift was started on this sub-level from a raise in the 5th Level main haulage drift, to strike the ore body about 40 feet West of the cave referred to in the previous paragraph. At the end of the year this drift had just struck ore, after advancing 50 feet. Near the hanging and 15 feet in front of this drift, is the breast of the old drift on this sub-level, referred to in the third preceding paragraph. It is planned to hole to this old drift and cut off the water that now comes in here. This will make it possible to mine a section further to the West, about 100 feet in length down to the 5th Level, without any trouble from water.

FIFTH LEVEL.

In January, 1925, the crosscut on the Southwest side of the deposit was extended 25 feet and holed to the hanging wall drift that had caved in September, 1924. Work on this crosscut was started in November, 1924; it was extended a distance of 100 feet. It provided a haulage road for handling ore mined on subs above the 5th Level, also a timber road for bringing in supplies to the gangs working further to the Southwest on C. & N. W.Ry. Co., Lease, Sec. 29. During the year, two raises were put up from this crosscut, one to the 1st sub above the 5th Level; the other to the 2nd sub.

In July, 1925, mining of the pillar left on the Southwest side of the deposit since 1917, on account of water conditions in this territory, was started by driving a drift along the hanging. This pillar was released for mining

in September, 1924, when the location of incoming mine water changed from above the 5th Level to the subs below the 5th Level. Work could not be started here, however, until the ore on the two subs above the 5th Level had been mined. At the end of the year it was estimated that there were 7,591 tons of ore remaining to be mined in this pillar. One contract worked here from July to October, when another was added; two worked here until December, when a third one started.

Several of the raises from the 5th Level to the 4th, that handle the ore being mined in the pillar left to support the 4th Level haulage drift to the shaft, were repaired during the year. The side pressure is so heavy that the raises close up so that the cribbing has to be taken out, ground removed and the cribbing replaced.

In January, 1925, it was decided to drive a crosscut at the Southeast end of the Stephenson ore body, from the side of an old crosscut that had caved. This new crosscut was located to come beneath the point where the water came in, in 1921, to the amount of 750 gallons per minute and stopped all work in this territory. The new crosscut was driven in January and February; it advanced 52 feet in footwall rock and across the ore body, that was 30 feet wide at this point. The first 20 feet of the ore was dry; the last 10 feet, near the hanging, was quite wet. A raise was then put up near the footwall to the 4th sub below the 5th Level, and a crosscut driven to the hanging. There was about 12 feet of ore in the back of the sub-level separating this drift from the 2nd sub below the 4th, where the water came in, in 1921. The sub-level drift caved and the 5th Level drifts below were filled with ore and rock for a distance of nearly 100 feet. A heavy door, in two sections, set in a concrete frame, was built in the haulage drift about 150 feet out from the raise. The lower half of this door was kept closed, and was opened when cars passed through. The upper section was closed every night when the men left. It provided a safety door to hold back a sudden rush of material. The ore and rock that were in the drift behind the door was then cleaned out. Another cave occurred in July, that filled the 5th Level drift for 50 feet. This material was also removed. Early in October, a rush of material came in, and on October 22nd another one, larger than any of the previous ones. It