

LLOYD MINE
ANNUAL REPORT
YEAR 1944

1. General - Cont'd.

The ratio of Lloydale grade shipped to total shipments was approximately 94%, as compared with 51% in 1943. The proportion of shipments of Silicious grade to the total decreased from 49% in the previous year to 6% in 1944. The large decrease in shipments from the mine was due to no Silicious ore being mixed with Cliffs Group ore as in previous years. The small shipments of this grade of ore was confined entirely to supplying orders for a special grade. At the close of the shipping season the Lloydale stockpile reserves were completely cleaned out and there was a stockpile inventory at the end of the year of 16,996 tons of Lloydale grade and 202,705 tons of Silicious grade. Due to the serious cutback in the shipment of the Silicious grade ore, production of this grade from the mine was decreased sharply starting in April. Early in the year about 42% of the monthly product was Silicious grade and by December this proportion had been reduced to about 26%. The total shipments of Lloydale grade from the mine was 260,472 tons in 1944 as compared with 289,257 tons in 1943, or a decrease of 28,785 tons.

During the first six months of the year the mine operated on a schedule of 3-8 hour shifts, 5 days per week and one 8 hour shift on the 6th day or Saturday. Effective July 1st, the working schedule was reduced to 3-8 hour shifts for 5 days per week and work on the 6th day was confined to underground repair work and other emergency repairs. Due to the large reduction in the labor force which resulted from men being drafted and also quitting it became necessary to reduce the operating schedule starting on October 30th, from 3-8 hour hoisting shifts per day to 2-8 hour hoisting shifts per day. Operations on the third shift were continued by about 60% of the mining contracts and this schedule was maintained for the balance of the year. A total of six holidays were observed during the year, and in accordance with the accepted interpretation of the President's Directive Order, rate and one-half was paid for any work performed on these days, and any work in excess of 8 hours per day or 40 hours per week, and double time for any work on the 7th consecutive day. There has been no change in the wage scale during the year.

Similarly as during the previous year mining operations have been confined entirely to the Lloyd East deposit and by the end of the year mining had reached a top elevation at the East end of the deposit of 80' above the 7th Level on the 415' Sub-Level. Every available area within the orebody has been developed for mining and to maintain maximum production from the orebody that is steadily decreasing in lateral extent, concentration of contracts into relatively small areas throughout the deposit has been necessary. The major portion of the product was obtained from slicing and several small stope operations between the 6th and 7th Levels. In the Westerly half of the deposit, two additional raises from the 8th Level were completed early in the year and mining from these raises was underway at the 7th level elevation and below at the end of the year. Near the central part of the orebody a sub-level stope was developed in an area between the 7th and 8th Levels and production was obtained from this area for about four months. The life of this stope, which was very productive, was relatively short due to the limited size of the ore area that could be developed for mining here. Development of the 8th Level was continued during the year and the main level heading was completed to the Easterly limit of the orebody, proving up a total length of 780' along the strike.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

1. General - Cont'd

However, as previously mentioned, only a narrow width to the orebody on the 8th Level has been outlined by the development and exploration. Two raises, one at the extreme East end of the deposit and another near the central part of the orebody have been completed in ore from the 8th to 7th Levels, and both are serving temporarily as ventilation connections between the levels. Additional raises will be put up from the 8th Level into mining areas above the 7th Level so that uninterrupted production can be maintained as operations in the various areas approach the 7th Level elevation. The average analysis of the Lloydale grade product for the year shows very little change as compared to last year. The average iron content for the 1944 output was 59.15, as compared to 59.18 in the previous year, and the Silica content shows a decrease from 8.62 in 1943 to 8.43 in 1944.

2. PRODUCTION
SHIPMENTS &
INVENTORIES

a. Production by Grades

<u>Grade</u>	<u>Tons</u>	<u>Percent</u>
Lloydale	248,064	65.9
Lloyd Silica	<u>128,799</u>	<u>34.1</u>
Total	376,863	100.0

This production compares with 494,042 tons produced in 1943 or a decrease of 117,179 tons. The percentage of Silicious grade to the total product was 34.1% as compared with 41.6% in 1943. Due to the smaller demand for the Silicious grade ore, production of this grade was reduced considerably and efforts concentrated on increasing the Lloydale grade proportion as much as possible. This factor has materially effected total production and costs due to the fact that relatively large quantities of Silicious ore can be easily obtained during the last stages of each stope operation after caving of the stope occurs. However, to keep in line with the decreased demand for this grade and the fact that a large inventory of Silicious grade remains in stock at the mine, a reduction in the production of this grade was advisable.

b. Shipments

Production exceeded the total shipments in 1944 by 99,814 tons. The large decrease in shipments is due to the small amount of Silicious grade that was shipped as compared to the previous year. The years shipments of Silicious grade were only 6% of the tonnage as compared to the previous year and not since 1933 have the shipments of this grade been below the 1944 tonnage. There was a decrease of 18,785 tons in Lloydale grade shipments as compared to the previous year due to the smaller production of this grade in 1944.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

2. PRODUCTION
SHIPMENTS &
INVENTORIES (Cont'd.)

b. Shipments (Cont.)

The following table shows the total shipments during the past six years:

<u>Year</u>	<u>Lloyddale</u>	<u>Silica</u>	<u>Total</u>
1939	362,000	115,848	477,848
1940	390,561	120,031	510,592
1941	406,526	51,397	457,923
1942	366,505	214,352	580,857
1943	289,257	283,254	572,511
1944	260,472	16,577	277,049

c. Stockpile Inventories

<u>Grade</u>	<u>Tons</u>
Lloyddale	16,996
Lloyd Silica	<u>202,705</u>
Total	219,701

The stockpile inventory at the close of the year was 99,814 tons in excess of last year with a large increase in the Silicious grade inventory and a slightly smaller Lloyddale grade balance.

d. Division of Product by Levels

The ore produced above various levels was as follows:-

	<u>Lloyddale</u> <u>Tons</u>	<u>Lloyd Silica</u> <u>Tons</u>	<u>Total</u> <u>Tons</u>
Seventh Level	146,711	83,760	230,471
<u>Eighth Level</u>	<u>101,353</u>	<u>45,039</u>	<u>146,392</u>
Total	248,064	128,799	376,863

The bulk of the product similarly as last year was obtained from above the 7th Level. Production from the 8th Level increased materially as compared to the previous year due to completion of additional raises from which mining has been carried on near the 7th Level elevation. A large part of the 8th Level development during the year was in ore, but the product from this source was relatively small.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

2. PRODUCTION
SHIPMENTS &
INVENTORIES (Cont'd)

e. Production by Months

<u>Month</u>	<u>Days</u>	Lloyddale	Lloyd	Total	<u>Rock</u>	<u>Tons per</u> <u>Man per</u> <u>Day</u>
		<u>Ore</u> <u>Tons</u>	<u>Silica</u> <u>Tons</u>	<u>Ore</u> <u>Tons</u>		
January	22-1/3	21,677	16,070	37,747	2,227	5.46
February	22-1/3	21,163	16,554	37,717	1,576	5.36
March	24-1/3	23,230	17,804	41,034	929	5.60
April	21-2/3	23,626	10,570	34,376	1,163	5.16
May	22-1/3	25,853	7,614	33,467	2,113	5.09
June	23-1/3	22,600	12,844	35,444	1,734	5.53
July	19-2/3	20,634	9,664	30,298	374	5.53
August	23	20,233	10,289	30,522	332	5.10
September	20	19,543	8,510	28,053	1,460	5.36
October	21-1/3	16,544	7,705	24,249	1,624	4.61
November	22	15,764	4,915	20,679	510	4.25
December	21	16,739	6,080	22,819	152	4.78
Total	263-1/3	247,606	128,799	376,405	14,194	5.19
Current Year Stockpile						
Over-run		458	-	458	-	
Grand Total		248,064	128,799	376,863	14,194	

f. Ore Statement

	Lloyddale	Lloyd Silica	Total	Total
	<u>Tons</u>	<u>Tons</u>	<u>Tons</u>	<u>Last</u> <u>Year</u>
On Hand January 1, 1944	29,404	90,483	119,887	198,356
Output for Year	247,606	128,799	376,405	492,516
Transfers	-	-	-	-
Over-runs	458	-	458	1,526
Total	277,468	219,282	496,750	692,398
Shipments	260,472	16,577	277,049	572,511
Balance on Hand	16,996	202,705	219,701	119,887
Decrease in Output			116,111	
Decrease in Shipments			295,462	
Increase in Ore on Hand			99,814	

The operating schedule for the past five years follows:-

1940 - 2-8 hr. shifts 5 days per week Jan. 1 to July 15, 2 crews since July 15, gradually increased to 3-8 hr. shifts, 3 crews. This third shift brought to full strength by Dec. 31.

1941 - 3-8 hr. shifts 5 days per week Jan. 1 to Jan. 24, 3 crews. 3-8 hr. shifts 5-1/2 days per week Jan. 25 to Aug. 31, 3 crews. 3-8 hr. shifts 5-2/3 days per week Sept. 1 to Dec. 31, 3 crews.

1942 - 3-8 hr. shifts 5-2/3 days per week Jan. 1 to Dec. 31, 3 crews.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

2. PRODUCTION
SHIPMENTS &
INVENTORIES (Cont'd)

f. Ore Statement (Cont'd.)

1943 - 3-8 hr. shifts 5-2/3 days per week Jan. 1, to Feb. 1, 1943. 3-8 hr. shifts 5-1/3 days per week Feb. 1 to Dec. 31, 1943.

1944 - 3-8 hr. shifts 5-1/3 days per week January 1, to July 1st, 1944. Effective July 1st, 1944, three shifts per day, 5 days per week, and effective October 30th, hoisting on two shift schedule.

g. Delays

There were two delays of consequence to hoisting during the year that resulted in some loss in product. The most serious delay was an accident to hoisting equipment that occurred when the axle on the headsheave for the North skip broke, causing the North skip rope to break and resulting in the skip dropping about 200' to the bottom of the shaft. The other delays were of a minor nature and it was possible in the latter cases to make up for the loss in product on the following shifts.

During the day shift on Saturday May 13th, the axle on the North skip head sheave broke as a skip of ore was being hoisted from the 8th Level. This caused the North skip rope to jump the sheave and wear against the shaft steel at the top of the headframe, breaking the rope and permitting the North skip to drop about 200' to the bottom of the shaft. The South skip rope head sheave was also badly damaged when the other sheave fell against it. The major damage occurred at the top of the shaft house where the steel work was bent and pulled out of line. At the bottom of the shaft, two dividers members and one end piece of shaft timber and the skip pit chute were broken when the skip fell. Work was started as soon as a crew of steel workers was organized repairing the damage to the steel work and by working continuously over the week-end and also on Monday the 15th, repairs were completed so that operation of the mine was resumed on the day shift of the 16th. This accident to hoisting equipment occurred at 10:00 A.M. and operation of the mine was suspended for the balance of the shift. A six hour delay to hoisting occurred as a result of this accident during the day shift Saturday and the loss of product on this account was estimated at 320 tons. On Monday the 15th, 3-8 hour operating shifts were lost resulting in a loss in product of 1550 tons. On Tuesday the 16th, a two hour delay to hoisting occurred when it became necessary to make a complete inspection of the skip roads and the loss in product on this account was 130 tons, to make a total loss in product caused by the breakdown of 2,000 tons. Inspection indicated that the cause of the axle breaking was due to a defect in the steel shafting. The 6" axle broke off flush with the hub of the sheave. The broken sheave and axle were installed new and had been in service for approximately 15 months. After giving careful consideration to the cause of the break in the axle, and also the seriousness of a breakdown resulting from such an accident to equipment, the Mechanical Department recommended changes in the size of the sheave axles from 7" to 8" in diameter inside the hub and from 6" to 7" on the bearings.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

2. PRODUCTION
SHIPMENTS &
INVENTORIES (Cont'd.)

g. Delays (Cont'd.)

Two new sheaves with the larger size axles and also heavier sheave construction were ordered and upon delivery of these sheaves to the mine late in the year, they were installed replacing the former sheaves with the smaller axles.

During the day shift operation on May 31st, a five hour delay occurred to hoisting when the South skip rope developed a bad section and necessitated removal and installation of a new rope. The estimated loss in product on account of this delay was 500 tons.

3. ANALYSIS

a. Average Mine Analysis on Output.

<u>Grade</u>	<u>Tons</u>	<u>Iron</u>	<u>Phos.</u>	<u>Silica</u>
Lloyddale	248,064	59.15	.143	8.23
Lloyd Silica	128,799	53.28	.124	17.08

There were no straight cargoes of mine shipments during 1944.

b. Analysis of Ore in Stock December 31, 1944.

<u>Grade</u>	<u>Tons</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Mang.</u>	<u>Alum.</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Loss</u>	<u>Moist.</u>
Lloyddale Dried	16,996	59.11	.156	7.86	.21	2.33	.68	.34	.010	3.20	
Lloyddale Nat'l.		52.41	.138	6.97	.19	2.07	.60	.30	.009	2.84	11.33
Lloyd Silica Dried	202,705	53.23	.118	16.89	.22	2.22	.65	.31	.010	3.25	
Lloyd Silica Nat'l.		47.51	.105	15.08	.20	1.98	.58	.28	.009	2.90	10.74

c. Complete Analysis of Ores Shipped

<u>Grade</u>	<u>Tons</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Mang.</u>	<u>Alum.</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Loss</u>
Lloyddale	260,472	59.10	.148	8.29	.21	2.33	.68	.34	.010	3.20
Lloyd Silica	16,577	53.00	.120	17.34	.22	2.22	.65	.31	.010	3.25

4. ESTIMATE OF
ORE RESERVES

a. Developed Ore

The following is the estimate of ore reserves made as of November 30, 1944 using a factor of 12 cubic feet per ton

LLOYD MINE
ANNUAL REPORT
YEAR 1944

4. ESTIMATE OF
ORE RESERVES (Cont'd)

a. Developed Ore (Cont'd)

	<u>Lloyd East Deposit</u>
Between 6th and 7th Levels	214,518
" 7th and 8th Levels	557,623
<u>Below 8th Level</u>	<u>145,979</u>
Gross Tons November 30th, 1944	918,120
<u>Less December 1944 Production</u>	<u>16,739</u>
Gross tons as of December 31, 1944	901,381
<u>Less 10% for Mining</u>	<u>91,812</u>
Total	809,569
<u>Less 10% for Rock</u>	<u>82,631</u>
Total Developed Reserves	726,938

The following table shows a comparison of the developed, or the decrease of standard grade ore reserves during the past three years.

	<u>1942</u>	<u>1943</u>	<u>1944</u>
Reserves on January 1st	1,242,580	662,641	707,170
Production	<u>368,050</u>	<u>288,412</u>	<u>248,064</u>
Balance	874,530	374,229	459,106
Reserves on December 31st	<u>662,641</u>	<u>707,170</u>	<u>726,938</u>
New Ore Developed	<u>211,889</u>	<u>332,941</u>	<u>267,832</u>

For the second consecutive year development and exploration on the 8th Level has disclosed additional reserves. As mentioned previously, the main drift on the 8th Level advanced an additional distance of about 455' in ore along the strike of the formation to disclose a total length of 780' of ore along the strike, but the width of the area is limited to an average of about 40'. Diamond drilling below the level has proved ore at one point to a depth of 165' below the level. The 8th Level development and exploration drilling accounts for the relatively large tonnage of newly developed ore in 1944 below the 8th Level elevation. Also the estimated reserves between the 7th and 8th Levels were materially increased over the previous year due to the increase in the size of the area that is used for estimating purposes on the 8th Level in 1944. The lateral extent of the orebody continues to steadily decrease in size as mining progresses to lower elevations due to converging of the North and South footwalls and the transverse fault which defines the Westerly limit of the orebody, and the newly developed ore is represented entirely in a downward vertical extension of the deposit. Between the 6th and 7th Levels, where the bulk of the product was obtained in 1944, a material reduction in the estimated reserves has resulted from inclusions of Jasper seams within the orebody, which formerly had been estimated and included as ore. As indicated above, the reserves were increased by 267,832 tons in excess of the remainder after deducting the 1944 production of Lloydale grade from the reserves as of December 31, 1944.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

4. ESTIMATE OF
ORE RESERVES (Cont'd)

b. Estimated Analysis of Ore Reserves

<u>Grade</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Mang.</u>	<u>Alum.</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Loss</u>	<u>Moist.</u>
Lloyddale Dried	58.70	.144	8.75	.021	2.32	.68	.34	.010	3.17	
Lloyddale Nat.	51.80	.127	7.72	.19	2.05	.60	.30	.009	2.80	11.75

The above analysis of ore reserves applies to Lloyddale Grade only as the Lloyd Silica reserves are not estimated.

5. LABOR AND WAGES

a. General

C.I.O

Since organization of the employees by the United Steelworkers of America C.I.O. a change in relations with the employees and also in their attitude has resulted, and this situation has not been entirely satisfactory during the year. The original contract agreement between the Company and the Union has continued in force and grievances submitted have been adjusted on the basis of the agreement. Upon request, a number of meetings have been held with the grievance committee during the year for the purpose of presenting complaints, and in several instances when complaints regarding working conditions that were unsatisfactory were presented, adjustments were made without the necessity of submitting the grievance in the formal manner. However, one grievance was submitted in the formal written manner, but an adjustment was denied in the second step of the grievance procedure and the case was not continued further due in all probability to the fact that the Union recognized the unreasonable nature of this grievance. It has been recognized for some time that harmonious relations are hindered by a relatively small group of employees and hope for improvement is dependent on the calibre of men the Union elects as officers and it's representatives.

There was a total of 227 men on the payroll at the end of the year as compared with 313 men a year ago. There was a total labor turn-over during the year of 107 men who left our employ and 21 employees were hired, resulting in a net decrease of 86 men. Loss of employees into the armed services was more than in the previous year due to the fact that in February occupational deferment could not be obtained for employees in the age group from 18 to 22 years, and about a month later draft regulations did not permit occupational deferments for employees in the age group from 22 to 26 years. At the end of the year occupational deferments were still being granted for men over 26 years of age. The underground labor force was most seriously effected by the loss of employees and for this reason necessitated a reduction in the operating schedule late in the year. No serious shortage of surface labor has resulted as yet, but the labor force on surface is made up of older men and also many who are physically unfit for underground work.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

5. LABOR AND WAGES (Cont'd.)

a. General (Cont'd.)

During the year a total of 34 employees entered the armed services and 52 quit to seek work elsewhere. The latter group represents the largest number of men who left our employ during the year and these men in most cases left to work in defense plants in larger cities where they were attracted by the higher wages and the large amount of overtime work that they would receive. The Company policy of granting no releases from their employment at the mine was upheld in the case of men who quit, but this did not seem to discourage many. At the close of the shipping season in November seven men were laid off the surface crew and this group were men, who in each case were physically unfit to be transferred to underground work. There were ten men transferred to other mines of the Company and one old employee who had long service with the Company was retired. Another old employee died and there was one fatality underground.

b. Comparative Statement of Wages & Product

Product	<u>1 9 4 4</u>	<u>1 9 4 3</u>	<u>Incr.</u>	<u>Decr.</u>
No. of Shifts & Hours	376,863	494,042		117,179
Jan. 1 to July 1, 1944	3-8 Hr. (5-1/3 Days per Week)			
July 1 to Oct. 31	3-8 Hr. (5 Days per Week)			
Oct. 31 to Dec. 31	(2-8 Hr. Hoisting (5 Days per Week) (3-8 Hr. Mining			
Jan. 1 to Jan. 31		3-8 Hr. (5-2/3 Days per Week)		
Feb. 1 to Dec. 31		3-8 Hr. (5-1/3 Days per Week)		

AVERAGE NO. OF MEN WORKING

Surface	63	71	8
Underground	205	242	37
Total	268	313	45

AVERAGE WAGES PER DAY

Surface	7.06	7.15	.09
Underground	7.99	8.10	.11
Total	7.66	7.88	.12

The following table shows a comparison of the average wages per day for surface and underground for the past five years.

<u>YEAR</u>	<u>SURFACE</u>	<u>UNDERGROUND</u>
1940	5.72	6.54
1941	6.51	7.42
1942	6.74	7.85
1943	7.15	8.10
1944	7.06	7.99

LLOYD MINE
ANNUAL REPORT
YEAR 1944

5. WAGES & LABOR, CONT'D.b. Comparative Statement of Wages & Product

<u>WAGES PER MONTH OF 24 DAYS</u>	<u>1944</u>	<u>1943</u>	<u>Incr.</u>	<u>Decr.</u>
Surface	169.44	171.60		2.16
Underground	191.76	194.40		2.64
Total	186.24	189.12		2.88
<u>WAGES PER MONTH OF 22 DAYS</u>				
Surface	155.32	157.30		1.98
Underground	175.78	178.20		2.42
Total	170.72	173.36		2.64
<u>WAGES PER MONTH OF 18 DAYS</u>				
Surface	127.08	128.70		1.62
Underground	143.82	145.80		1.98
Total	139.68	141.84		2.16
<u>WAGES PER MONTH OF 12 DAYS</u>				
Surface	84.72	85.80		1.08
Underground	95.88	97.20		1.32
Total	93.12	94.56		1.44
<u>PRODUCT PER MAN PER DAY</u>				
Surface	21.42	24.32		2.90
Underground	6.86	7.24		.38
Total	5.19	5.58		.39
<u>LABOR COST PER TON</u>				
Surface	.329	.294	.035	
Underground	1.166	1.118	.048	
Total	1.495	1.412	.083	
<u>AVERAGE PRODUCT STOPING</u>				
	19.19	19.66		.47
<u>AVERAGE WAGES CONTRACT MINERS</u>				
	8.35	8.66		.31
<u>TOTAL NUMBER OF DAYS</u>				
Surface	17590 ³ / ₄	20315 ³ / ₄		2725
Underground	54945	58224		13279
Total	72535 ³ / ₄	88539 ³ / ₄		13004

LLOYD MINE
ANNUAL REPORT
YEAR 1944

5. LABOR & WAGES - CONT'D.

b. Comparative Statement of Wages & Product - Cont'd.

<u>AMOUNT OF LABOR</u>	<u>1944</u>	<u>1943</u>	<u>Incr.</u>	<u>Decr.</u>
Surface	124,138.08	145,242.31		21,104.23
Underground	439,090.12	552,345.62		113,255.50
Total	563,228.20	697,587.93		134,359.73

PROPORTION OF SURFACE TO UNDERGROUND MEN

1939 - 1 to 3.66
1940 - 1 to 3.61
1941 - 1 to 4.25
1942 - 1 to 3.90
1943 - 1 to 3.40
1944 - 1 to 3.24

6. SURFACE

a. Buildings

There was no building construction or additions to existing buildings erected during the year. Only minor routine repairs were necessary to maintain the surface buildings in good condition.

A new metal smoke stack 22" in diameter and 52' in length was installed on the dry and office heating plant at the North end of the building. The original stack had been in service since the combined office dry house and shop buildings were erected in 1936 and it had become badly rusted and necessitated replacement.

During the Labor Day week-end in September, major changes were made in the skip dump in the headframe. The main steel channel iron supports for the skip dump and also the chute below had become badly rusted and worn over a period of years and the structure was weakened to such an extent on this account that it was necessary to practically build new dumps. A crew of steel workers was organized to replace the weakened steel members and also to install the new steel plate. The major part of the work was completed during this week-end, but work was required on several following week-ends to complete the installation of wearing plates throughout the dump. The re-built skip dump will very likely serve with only minor repairs for the remaining life of the mine.

The interior of the warehouse, including the shelves was given a coat of paint of two-tone color, the floor was also given two coats of tile floor enamel.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

6. SURFACE - CONT'D.

a. Buildings - Cont'd.

An extension to the hot air vents was installed to the unit heaters in the clean clothes room in the dryhouse. The enclosed extensions were constructed of galvanized sheet metal and extended from the unit heaters down to near the floor level. The circulation of heat was considerably improved in this room after installation of these extensions.

During the warm weather in the summer, two coats of asphalt roofing compound were applied to the roof on the engine house. The asbestos roofing on this building is deteriorating rapidly on one side, but application of the two coats of asphalt has sealed the leaks and insured longer life. The intakes of both compressors were extended by means of metal pipe to the roof elevation along the North side of the engine house. Metal guards have also been provided at the openings to these intakes. The original intake extensions that were erected two years ago in line with the plant protection program to guard against sabotage proved unsatisfactory due to excessive vibration.

b. Stocking Grounds

At the close of the shipping season in November all of the Lloydale ore was loaded out from the stocking grounds to the East of the shaft. Due to the very small shipments of Silicious Grade ore in 1944 a large inventory of this grade remains in the stockpiles at the mine. Stocking of this grade with the exception of small shipments from the pocket was continued throughout the summer months and to completely fill the East stocking area of this grade a scraper hoist was used to fill to capacity the area between two piles.

Loading from the stockpile at the opening of shipping season early in the spring has frequently been hindered considerably due to freezing of the ore. In 1944 similarly as in the previous year blasting of the stockpiles were done preliminary to the steam shovel loading. The Lloydale Grade stockpiles were blasted along their entire length by means of vertical holes placed along the crest of the pile at about 8' intervals. Blasting of these holes has proved successful in breaking up the frozen ore and hastening the thawing of the pile ahead of shovel operations.

A number of wooden bents of the permanent trestle approach to the West of the shaft were torn down and replaced during the summer months. Replacement of this portion of the trestle became necessary due to rotting of nearly all the timber members in this portion of the trestle which had been in service for many years. Two bents 36' in width and two bents 12' in width were constructed of new material and erected to replace the rotted portion. A decking of 3" fir was laid to cover the permanent part of the trestle and a guard rail placed along each side. After the new approach was constructed a total of 17 bents of wood trestle were erected to the West of the shaft to serve for stocking Silica Grade after the area to the East was filled to capacity. During the latter part of the shipping season as the stockpiles of Lloydale Grade were cleaned out to the East of the shaft, three separate wooden stocking trestles which branch and roughly parallel each other were erected extending to the limits of the stocking-area. These new trestles will provide sufficient capacity to stock the production of Lloydale Grade during the winter months until the opening of the shipping season in 1945.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

6. SURFACE - CONT'D.

b. Stocking Grounds - Cont'd.

To eliminate the necessity of extending additional stocking trestle for rock to the South of the shaft, the bull-dozer was employed widening out the pile into the adjacent cave. By this means additional rock dumping capacity was provided for another year.

c. Roads

Only a very small amount of grading and an occasional truck load of mine rock was necessary to maintain the main road into the mine and the parking lot area in good condition. A small amount of grading and several loads of gravel was used to fill in a wash-out caused by heavy rains in the summer on the road from the mine shops to the shaft. During the winter months the bull-dozer was used in cleaning the roads of snow in and about the surface plant and also the parking lot area.

7. UNDERGROUND

a. Shaft Sinking

There was no shaft sinking in 1944.

b. Development

A heavy development program has been continued throughout a major part of the year, and development on the 8th Level has comprised the major part of the work. During the year the main level drift was advanced in ore to the East limit of the orebody, and the development together with some exploration drilling has outlined an ore area on the 8th Level that has resulted in proving up a favorable increase in the ore reserves.

Drifting in ore comprised a large part of the 8th Level development. The main level heading to the East was advanced for a distance of 455' in Lloydale Grade ore before encountering the East limit of the orebody formed by the converging North footwall slate and the South footwall dike. A short cross-cut branching to the Northeast from the main level ore drift was driven about midway in the orebody, about 30' of which was in ore and 60' in footwall slate and jasper. A second cross-cut branching to the Southeast was also driven about midway in the ore area, the first 30' of which was in ore and 60' in the South footwall dike and jasper. In the footwall slates West of the Westerly limits of the 8th Level ore area about 210' of rock drift was advanced to provide a by-pass drift to facilitate the tramming operations, and from the South side of this drift a short branch drift was advanced to the South and a powder magazine excavated at the end of the drift.

Four additional raises were completed from the 8th to the 7th Levels during the year. Mining was started at the 7th Level elevation immediately upon completion of two of the raises in ore, No. 802 and No. 809 in the Westerly part of the orebody. No. 809 raise was started late in the previous year and encountered jasper at a height of 40' above the level, but the raise was continued in 1944 to the 7th Level elevation and encountered about 20' of ore again before reaching the latter elevation.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND - CONT'D.

b. Development - Cont'd.

No. 811 Raise, which is located in the short cross-cut to the Northeast, was put up in ore to the 7th Level, and is serving temporarily as a ventilation connection between the levels, and will also be used for mining when slicing operations in an area above reach the limit of mining from a 7th Level raise. No. 821 Raise was put up in ore near the East end of the deposit and this raise is also serving temporarily as a ventilation connection between the levels until mining directly above reaches an elevation of about 25' above the 7th Level. No. 808 Raise was put up along the North side of the main level ore drift and jasper was encountered in the raise at a height of 40' above the level and preliminary to development work that was done from the raise on the 225' sub, some exploration drifting and raising was done to determine the extent of jasper. The fact that jasper was encountered in this raise at a distance of only 40' above the 8th Level similarly as in No. 809 Raise, definitely indicates a considerable downward extension of a large mass of jasper hanging within the ore area from the 7th Level elevation. A large amount of development work was done on various sub-levels between the 8th and 7th Levels primarily for stope development. On the 225' sub a transfer drift 175' in length was advanced to the West from No. 808 Raise and about 100' of the transfer was driven in jasper before encountering the ore. This drift was part of the development for stoping an ore area that extended to the 7th Level elevation. Two short exploration drifts to the North and East were also advanced in the same material from No. 808 Raise and a short connecting drift to the Southeast was advanced in jasper to No. 809 Raise. The large extent of the jasper disclosed by this development and exploration has proved very disappointing from a standpoint of ore reserves between the 7th and 8th Levels, as it limits the lateral extent of the ore to a very narrow width along the South footwall dike and this fact offsets to a large extent the favorable increase in the vertical extent of the known ore. The balance of the development work on the 225' sub-level consisted of a connecting drift about 100' in length that was advanced from No. 805 to No. 802 Raise. On the 235' sub-level a transfer drift 150' in length was advanced to the Northwest from No. 804 Raise for a distance of 120' in ore and the balance was in footwall material. Some stope development was carried on above this elevation from the transfer, but due to the soft character of the ore encountered, which made it difficult to maintain the drifts and raises open, the plan to mine by stoping the ore area above here was abandoned in favor of mining it by the slicing method. Late in the year development for a sub-level stope was being carried on from a transfer drift East of No. 809 Raise on the 235' sub. A transfer drift 180' in length was completed in ore to the East of the raise and it is planned to develop a sub-level stope in a narrow ore area above the transfer along the South footwall dike. On the 260' sub-level another transfer drift 150' in length has been completed in ore to the Northeast of No. 821 Raise, extending to the East limit of the orebody formed by the converging North and South footwalls. A portion of the narrow ore area at the East end will be developed for sub-level stoping by means of this transfer when mining above has been completed to an elevation of about 25' above the 7th Level.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND - CONT'D.

b. Development - Cont'd.

A raise was put up from the East end of the transfer for a distance of 34' and after cutting out the raise on the 300' sub-level and advancing a short drift again to the East to the limit of the orebody work was temporarily abandoned and the balance of the development for a sub-level stope here will be completed early in 1945. A small amount of exploration drifting was done near the central part of the orebody on the 260' sub-level most of which was in jasper and lean ore. Similarly as at lower elevations a large mass of jasper hanging has been outlined extending below the 7th Level elevation near the central part of the deposit resulting in the lateral extent of the ore being confined to narrow limits adjacent to the South footwall dike. Near the West limit of the orebody some sub-level stope development was done on the 260' sub-level, but as mentioned previously, the nature of the ore was found unsuitable for stoping and this work was abandoned early in the year. On both the 275' sub-level and the 300' sub-level some development and exploration drifting was done near the central part of the ore area and most of this work as on the lower elevations was in lean ore and jasper. At the latter elevation one short hole was drilled with the Gopher Drill to completely cross-cut the iron formation in a North-South direction, but no concentration was disclosed by this drilling.

On the 7th Level the major part of the development during the year was in rock. A by-pass drift in the North footwall slate around the West end of the orebody was started late in the previous year and was completed in January. About 30' of rock drifting was done to complete the connection to the original footwall drift. Later in the year an additional portion of the original footwall drift was affected by adjacent mining operations, and it became necessary to drive an extension to the footwall by-pass drift further East for a distance of 235'. About 600' of the original footwall drift, part of which was in ore has been replaced by the new footwall drift. The latter drift is located a sufficient distance North of the orebody so that it will not be affected by future mining operations. About midway in the 7th Level ore area a cross-cut 155' in length was driven to the Southeast connecting the North and South footwall drifts. About 90' of the cross-cut was driven in footwall slate and jasper and the balance was in ore. After completing the cross-cut, No. 750 Raise was cut out in the ore about midway along the Southwest side and the raise was advanced 47' in ore to complete it to the 390' sub-level. This raise was put up to replace a mining raise from the South footwall drift that was subject to heavy crushing and was difficult to maintain. Near the West end of the Westerly limits of the 7th Level orebody No. 780 Raise was put up for ventilation purposes in the footwall slate to the 6th Level. This raise will serve as a permanent ventilation connection between the levels, replacing No. 701 Raise which has served as a ventilation raise until it was affected by the mining operations at the West end of the deposit. No. 780 Raise was advanced 32' in slate full size and 114' small size to complete it to the 6th Level elevation.

The balance of the development work on the 7th Level consisted of several short connections in ore and jasper that were driven to provide travelling and ventilation connections from raises that had been put up from the 8th Level to nearby crosscuts and drifts.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

b. Development - Cont'd.

On sub-levels above the 7th Level, where the bulk of the product was obtained the major part of the development was for scam sub-level stope operations. At the East end of the deposit short transfer drifts for scam stope operations were driven on two separate sub-levels. On the 375' Sub-Level a transfer drift in ore was driven for a distance of 90' to the East limit of the orebody and subsequently mill raises and connecting drifts between the mills were driven above the transfer to complete the development. When operations were completed to the transfer drift elevation on the 375' Sub, another transfer was driven on the 360' sub-level a short distance above the 7th Level elevation. A transfer drift 80' in length was advanced in ore to the East limit of the orebody, and late in the year four mill raises were put up along the North side and a connecting drift completed between the mills a short distance above the transfer. On various other sub-levels above the 7th Level small pillars above slicing areas were recovered by means of scam sub-level stopes where ever practical. The development in most of these cases consisted of putting up one or more mills along the side of a slice into the pillar above and by means of short drift connections small stopes one sub high were developed to recover the pillar. In addition to the development for stoping a relatively small amount of development drifting was done in rock and ore from mining areas to connect with adjacent development for ventilation and travelling purposes. Near the East end of the deposit on the 415' sub about 55' of small drift was advanced in slate from the end of a slice North-east of No. 712 Raise to provide a connection to a ventilation raise in the North footwall. On the 390' sub a small drift connection in jasper and ore was advanced from a slicing area Northwest of No. 714 Raise to hole to a travelling raise that extends to the 6th Level elevation. Prior to slicing in the latter area stope operations were carried on above this elevation in Silica Grade and a small amount of Lloydale Grade. The major part of the development for this stope was completed in the previous year, but before stope operations were completed several additional mill raises were put up from the side of a slice on the 390' sub-level, as additional development to complete recovery of some Lloydale Grade ore.

On the 6th Level the development work during the year consisted of 15' of small drift connection in slate from a raise put up from the 7th Level to the main haulage drift. As mentioned previously No. 780 Raise was put up from the 7th to the 6th Levels West of the orebody in the footwall slate to provide a permanent ventilation connection between the levels.

In addition to the regular development contracts, a number of mining contracts have ^{done} some ore and rock development work on their respective sub-levels. At the start of the year there was a total of nineteen contracts employed, fifteen of which were mining and four were on development. Due to the decrease in the size of the orebody as mining progressed to lower elevations, a reduction was made in the number of contracts and at the end of the year there was a total of fifteen contracts, twelve of these were mining and three were on development work. The total development footage decreased considerably in 1944 as compared with previous years due mainly to less sub-level stope development. In 1944 the total development footage was 9,447 feet as compared to 11,120 feet in 1943. Classification of the footage is given later in the report in paragraph 7-e.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

c. Stoping

Similarly as in the previous year mining operations in 1944 have been confined entirely to the Lloyd East Deposit and for the second consecutive year the bulk of the product has been obtained from mining areas above the 7th Level. A relatively small proportion of the product was obtained from ore development on the 8th Level and above and the balance of the product was mined from new 8th Level raises in the Westerly part of the deposit at the 7th Level elevation and below. One very successful sub-level stope was developed between the 7th and 8th Levels during the year, but the percentage of the product from sub-level stope operations continues to decrease and production is dependent more and more upon the top slicing areas. Every available area within the orebody has been developed for mining and to maintain maximum production some efficiency is sacrificed by concentrating the contracts and employing as many as practical within the orebody. The lack of new areas that can be developed for mining together with the continued decrease in the lateral extent of the orebody as mining progresses to lower elevations is seriously effecting the productive capacity of the mine, and will continue unless the exploration program discloses additional reserves tributary to existing development. Another factor that effected production adversely in 1944 was the reduction in the proportion of Silicious Grade ore that was produced to keep production in line with the smaller demand for this grade. Starting early in the year efforts have been concentrated on increasing the proportion of Lloydale Grade production as much as is practical.

In the East half of the deposit slicing operations at the end of the year were being conducted on various sub-levels ranging from the 7th Level elevation to the 415' sub-level. The latter sub-level which is about 80' above the 7th Level is the highest elevation at which mining was being carried on. Near the West end and in a greater portion of the West half of the deposit slicing operations had been completed at the 7th Level elevation and by the end of the year had reached an elevation of one sub below the Level at the extreme West end and three subs below the Level in another area in the Westerly half of the deposit. The latter area is the lowest elevation to which slicing operations have progressed in the orebody. As mentioned previously, a sub-level stope was developed between the 7th and 8th Levels in the central part of the deposit, but the life of this stope was relatively short due to the limited size of the ore area that could be developed for stoping. A high rate of production of Lloydale Grade ore was obtained for a period of about four months to complete the stope operations.

A gradual reduction in the lateral extent of the orebody continues to reduce the efficiency in the top slicing areas due to shortening the length of the slices and increasing the rate of mining successive sub-levels. Interruptions to production are becoming more frequent due to more time spent in timbering when starting new slices and moving down to develop successive sub-levels. During the latter part of the previous year a sub-level stope was developed in a Silicious ore area along the North footwall side above the 7th Level, but operation of this stope was curtailed early in the year and work concentrated on production of Lloydale Grade ore. However, some of the stope development here was in Lloydale Grade ore and it was possible to recover this ore by stope operations before slicing operations were started directly below.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

c. Stopeing - Cont'd.

A relatively small sub-level stope operation has been employed in mining a portion of the extreme East end of the deposit. Late in the year stoping in this area had approached an elevation of approximately 20' above the 7th Level. The major portion of the product from the stoping at the East end has been Lloydale Grade, but some Silicious Grade had also been obtained during the last stages of each operation. In many instances small scam stopes were developed to recover small pillars above the slices in areas above the 7th Level. In almost every case where it was found practical to recover a pillar above the slices one or more mills were put up from the side of a slice and by means of short drift connections between the mills small one sub stopes were developed to recover the pillars. Stoping, development and slicing operations have been conducted on a total of seventeen different sub-levels during the year, eleven of which were above the 7th Level and six sub-levels above the 8th Level.

The following is a detailed description of the mining operations on the various sub-levels during the year.

Subs above the 7th Level - Lloyd East Deposit.
465' Sub-Level.

Early in the year two contracts carried on stope operations at the East end of the deposit. Near the extreme East end an area 100' x 60' of Lloydale Grade ore was mined by stoping operations from a transfer on the 415' sub-level. By means of a small scam stope another area nearby, 50' x 20' was stoped above a slice on the 450' sub-level. In addition to the stoping in the latter area, three short slices were mined to the South-east of No. 712 Raise to the South footwall dike. In the Silicious ore area near the central part of the deposit along the North footwall side sub-level stope operations at lower elevations induced a cave which extended to the 6th Level floor elevation. An area about 180' x 30' of Silicious ore was mined by caving by this stope operation.

450' Sub-Level.

An average of seven contracts carried on mining operations at this elevation during the year. One of the contracts completed stoping an area about 100' x 50' at the East end of the deposit in Lloydale Grade ore. To the West of the area that was mined by stoping five contracts carried on slicing operations from a series of four 7th Level raises. Mining from No. 712 Raise was done in a small area lying adjacent to the South footwall dike and bounded on the East side by the jasper hanging that has also been encountered on sub-levels above in this area. Along the North footwall side, three of the 7th Level raises Nos. 710, 716 and 718 served for mining relatively short slices to the North and South. Another small area along the North footwall side was mined by means of No. 712A Raise, which was put up from a short transfer on the 415' sub-level. A small amount of stoping was done in the Silicious ore area along the North footwall side. A stope that was developed late in the previous year was slightly enlarged in Silicious ore by retreating it to the West. To the West of the original stope at this elevation three small separate stopes were developed and due to the spotty concentration in this area stoping operations were abandoned here early in the year.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

c. Stoping-Cont'd.

Subs above the 7th Level - Lloyd East Deposit-Cont'd.

440' Sub-Level.

An average of seven contracts carried on mining operations at this elevation; two of the contracts did some stoping and five contracts carried on slicing operations in the Easterly part of the deposit. In the narrow area at the East end an ore area about 70' x 50' of Lloydale Grade was mined by stope operations. Directly West of this area five contracts carried on slicing operations from four 7th Level raises similarly as on the sub-level above. Along the South footwall side a small area was mined from No. 712 Raise with short slices radiating from the Southeast to the Southwest. A mass of jasper hanging within the ore areas was encountered here similarly as above directly East of the raise. Along the North footwall side four contracts mined with short slices North and South of the series of raises Nos. 710, 716 and 718 and also from No. 712A transfer raise. Before mining was completed in the latter area the number of contracts was reduced to four due to the decrease in the lateral extent of the ore as compared with sub-levels above. In the Silicious area along the North footwall side the original stope was enlarged slightly by retreating it to the West and further to the West a small stope was developed before stope operations were abandoned here.

425' Sub-Level.

Four contracts carried on mining operations at this elevation during the year. Two of the contracts were stoping and two were slicing. Near the East end of the deposit an area about 80' x 50' was mined by stoping. The bulk of the product from the stope was Lloydale Grade, but during the last stages of the stope operation caving from the back occurred and some Silicious ore was also obtained. Near the central part of the deposit two contracts sliced an area 180' x 80' from Nos. 713 and 718 Raises. Mining was carried on from the latter raise with slices radiating about the raise and extending from the South footwall dike to the North footwall slate and jasper. Mining from No. 713 Raise was done to the Northeast and Northwest with slices that extended to the North footwall. As compared with sub-levels above the latter slicing area has been considerably reduced in extent in a North-South direction due to converging of the North and South footwalls as mining progresses to lower elevations. In the Silicious ore area adjacent to the North footwall some stoping was done retreating the original stope to the West. An area 120' x 25' was mined in Silicious ore before operations were abandoned here.

415' Sub-Level.

This sub-level is the highest elevation at which mining was underway at the end of the year. In the central part of the deposit slicing operations had been completed by three contracts working from Nos. 711, 715 and 718 Raises. The first two raises are located adjacent to the South footwall dike and slicing operations from these raises was confined entirely to the North to the jasper hanging.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

c. Stoping-Cont'd.

415' Sub-Level - Cont'd.

Mining from No. 718 Raise consisted of slices that extended to the South footwall dike and also North to the jasper and slate footwall. A small amount of stoping was done in Silicious ore adjacent to the North footwall. During the last stages of the stoping operation here some Lloydale Grade was mined before slicing operations were started at a lower elevation. In December two contracts were slicing in the Easterly part of the deposit from No. 710 and No. 712 Raises. Mining from the latter raise is confined to a small area adjacent to old stope workings at the East end, and the extent of the ore here is materially reduced by a transverse dike about 6' in thickness which cuts through the orebody in a Northeast and Southwest direction. Mining from the latter raise at the end of the year was underway in a narrow pillar between the dike and the South footwall. Mining from No. 710 raise has been carried on to the West and North and late in December recovery of a remaining pillar North of the raise was underway. At the East end of the deposit a small triangular shaped area lying between the old transfer drift and the North footwall was recovered by means of a scram stope operation above a transfer on the 375' sub-level.

400' Sub-Level.

Two contracts were slicing at this elevation in December in an area near the central part of the orebody. One of the contracts working from No. 715 Raise had completed slicing an area East of the raise and late in the year mining was underway North towards the footwall. A second contract had moved down to develop this sub-level from No. 718 Raise late in the year. In December slicing operations were started to the Southeast and two slices had been completed to the jasper which lies along the South diabase dike. A small area along the South footwall dike and to the West was mined earlier in the year by one contract that carried on slicing operations from No. 707 Raise. From the latter raise slices were advanced to the West to an old mined area and North and Northeast to the jasper. Directly North of the latter area stoping operations were conducted early in the year in Silicious ore and some Lloydale Grade similarly as on sub-levels above. An area approximately 170' x 25' was stoped at this elevation and as mentioned previously stoping operations were abandoned here and slicing operations were started on a sub-level directly below. At the East end of the deposit an area 120' x 30' was mined by means of a scram stope operation from the transfer on the 375' sub-level. The bulk of the product from this stope was Lloydale Grade and when caving of the stope occurred some Silicious Grade was also mined.

390' Sub-Level.

One contract was carrying on slicing operations along the South footwall side in the central part of the deposit at the end of the year. Short slices were being advanced radiating from the Northeast to the Northwest to the jasper from No. 707 Raise. Late in December a small pillar West of the raise and which extended a short distance to old workings was all that remained to be mined from this raise. After completion of stoping operations in the Silicious ore area along the North footwall side one contract started slicing in Lloydale Grade ore from No. 750 Raise at the old transfer sub elevation.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

c. Stoping - Cont'd.
Subs above the 7th Level - Cont'd.

390' Sub-Level - Cont'd.

Slicing operations were completed at this elevation late in the year and the area here was joined with the slicing area to the South. At the East end of the deposit one contract mined an area about 100' x 35' by means of a scam stope above a transfer on the 375' Sub.

375' Sub-Level.

Two contracts were carrying on operations at this elevation at the end of the year. A narrow ore area in the crotch at the East end of the deposit was being mined by means of a scam stope operation similarly as was done on sub-levels above. A transfer drift East of No. 706 Raise was driven to the limit of the orebody and mill raises were put up along the North side of the transfer as development for the stope. When stope operations were completed to a short distance above this elevation another transfer was driven below this elevation and development from the lower transfer had been completed to this elevation late in the year to enable stope operations to be resumed. The bulk of the product obtained from the operations here was Lloydale Grade, but in December caving of the stope had started and some Silicious ore was also being obtained. Near the central part of the ore area one contract was carrying on slicing operations to the West of No. 750 Raise. Mining is being carried on here directly below the stope that was developed in the Silicious ore area along the North footwall side and slices have disclosed only a small extent of Lloydale Grade ore. A portion of the slices advanced to the West in December were in Silica ore to enable recovery of all the Lloydale Grade. A number of short diamond drill holes were drilled during the previous year at this elevation to the North and South from the drift that was driven through the orebody along the strike. The outline of the ore area has been well defined from the drilling and development at this elevation and the extent of the ore indicates a considerable decrease in size as compared to sub-levels above. Due to the limited extent of the ore at this elevation it is apparent that a further reduction must necessarily be made in the number of contracts that can be employed as mining above progresses to this elevation. At the extreme West end of the deposit a triangular shaped pillar of Lloydale Grade was recovered by means of a scam stope above a slice that was advanced in a mining area on the 350' sub directly below.

360' Sub-Level.

At the East end of the deposit a small amount of development was done at this elevation for a scam stope. A transfer drift 70' in length was advanced in Lloydale ore East of No. 706 Raise to the limit of the orebody. By the end of the year four mills had been put up from the North side of the transfer and in December stope operations were being conducted on a sub directly above the transfer drift. The orebody at the East end of the deposit is limited to a very narrow width and pinches out in a crotch formed by the converging North and South footwalls.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

c. Stoping - Cont'd.
Subs above the 7th Level - Cont'd.

360' Sub-Level - Cont'd.

Also a relatively large amount of water is encountered here and due to these two factors, this portion of the orebody lends itself to mining by the sub-level stope method instead of top slicing. Mining is rapidly approaching the 7th Level elevation in this area and in 1945 development will be completed from the 8th Level to permit stope operations to be carried to lower elevations. At the extreme West end of the deposit a relatively large pillar of Lloydale Grade ore was recovered by caving and mining above a slicing area on the next sub-level below.

350' Sub-Level.

One contract carried on slicing operations at this elevation near the West limits of the orebody. A relatively large area was mined by slices advanced to the Northwest to the slate and jasper footwall from No. 741 Raise. As mentioned above a relatively large pillar of ore was recovered above the slices here by means of a scum stope operation. Three mill raises were put up from the slices as development for stoping the pillar above. A pillar of ore that was left remaining at this elevation late in the previous year between two adjacent slicing areas along the South footwall side was recovered by slicing operations from the next lower sub-level early in the year.

7th Level.

In the Westerly part of the orebody mining operations had been completed during the year by five contracts. By the end of the year mining operations had reached the level elevation in a small area near the central part of the deposit along the South footwall side. One contract was slicing in the latter area from No. 809 Raise. Several short slices had been completed to the mined area West of the raise and late in December slices were being advanced to the East towards the mining limit. At the West end of the deposit No. 802 Raise from the 8th Level was completed to this elevation early in the year and two contracts were transferred to carry on slicing operations from the raise. A number of slices in this area were advanced through the old 7th Level drifts and crosscuts to enable recovery of all the ore. Some of the mining here was carried on under the jasper hanging and considerable trouble was experienced due to the frequent occurrence of runs of jasper, but a good covering of poles was laid on the floor of the slices to start the formation of a timber mat for subsequent sub-levels. To the East of the latter area three contracts completed slicing operations in an area along the South footwall side from No. 805 and 807 Raises. Two contracts were employed at the latter raise and one contract was mining from No. 805 Raise. Favorable conditions for slicing operations has enabled a high rate of production to be maintained in the latter area. The length of the slices that can be advanced here are relatively short but their average length exceeds the length of slices that can be advanced in other slicing areas.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

c. Stoping - Cont'd.
7th Level - Cont'd.

Slicing operations have been completed on several sub-levels above and a good covering of poles on each of the completed sub-levels has provided a timber mat directly above the slices that is conducive to good slicing operations. Directly North and adjacent an area 130' x 50' was mined by stoping operations in Lloydale Grade ore. The balance of the work on the 7th Level consisted of development that has been previously mentioned. A by-pass drift in the North footwall slate was driven around the West end of the orebody and the major portion of this work was done late in the previous year. About 30' of rock drift was advanced early in 1944 to complete the connection to the original footwall drift near the switch leading into No. 720 crosscut. Due to an additional portion of the original footwall drift being effected by mining operations it became necessary to advance an extension to the by-pass drift in the North footwall further to the East. A total of 235' of rock drift was advanced to complete the extension. Before a portion of the No. 720 crosscut was effected by mining operations and was lost to tramping a short crosscut was advanced about midway in the 7th Level ore area connecting the North and South footwall drifts. One additional raise was put up from 7th Level during the year for mining purposes and this raise was cut out in ore along the Southeast side of the latter crosscut. Upon completion of No. 811 Raise from the 8th to the 7th Level elevation a short drift connection was advanced for a distance of 35' to hole to the side of the new crosscut. This connection is serving temporarily as a ventilation connection between the two levels. Near the East end of the 7th Level ore area No. 821 Raise was also completed from the 8th Level to the 7th Level and about 20' of small drift advanced to connect to the South footwall drift. This connection is also serving temporarily as a ventilation connection between the levels.

Subs above the 8th Level.

325' Sub-Level.

In the Westerly part of the orebody four contracts completed slicing and stoping operations in an area along the South footwall side and two contracts were carrying on slicing operations at this elevation late in the year at the extreme West end of the deposit. Along the South footwall side two contracts working from No. 807 Raise similarly as on the sub-level above completed slicing South to the footwall dike and North to an area that was stoped. One contract mined from No. 805 Raise with slices that radiated about the raise South to the footwall dike and North and West to the Jasper. Adjacent to this area to the North an area about 110' x 50' of Lloydale Grade was mined by stope operations. At the West end of the deposit two contracts were carrying on slicing operations from No. 802 Raise in December.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

c. Stoping - Cont'd.
Subs above the 8th Level- Cont'd.

325' Sub-Level - Cont'd.

One of the contracts was advancing slices to the South and Southeast to the Jasper that over-lies the footwall dike along this side and the other contract was slicing to the West of the raise with slices that extend to the West limits of the orebody. Better conditions for slicing operations have been experienced at this elevation in the latter area as compared with the sub-level above due to the good covering of poles and wire that was laid in the floor of the slices above. Jasper hanging was encountered directly East of the raise but as mining progresses to lower elevations, extension of the ore to the East under the Jasper is anticipated.

315' Sub-Level.

Three contracts had completed slicing operations at this elevation in an area in the Westerly part of the orebody along the South footwall side. Similarly as on the sub above two contracts carried on operations from No. 807 Raise and one contract mined from No. 805 Raise with slices that extended to the South footwall dike and North to an area mined by stoping. Directly North and adjacent to this area stoping operations were carried on and an area about 110' x 50' of Lloydale Grade was mined by stoping.

300' Sub-Level.

This sub-level is the lowest elevation at which slicing operations were being conducted in the orebody at the end of the year. In December all three contracts working in the area in the Westerly half of the deposit along the South footwall side moved down to develop this area for mining upon completion of work on the sub-level above. Two contracts started operations from No. 807 Raise, one slicing to the East to the mining limit and the other South towards the footwall dike. The third contract working from No. 805 Raise had completed a short travelling and ventilation connection Northeast and by means of a short raise from the end of the drift a connection was made to an old 7th Level crosscut. Mining was then started to the South and the first drift was nearing completion to the footwall dike. In the area that was mined by stoping directly North of this slicing area two separate stopes were developed at this elevation. One of the stopes was developed to approximately 60' x 40' in size and when caving from the back started a narrow pillar was left along the East side and another stope developed to about 30' x 30' in Lloydale Grade. The balance of the work on this sub-level consisted of development and exploration as has been previously described. At the extreme West end a small amount of sub-level stope development was done but the plan to develop a stope here was abandoned in favor of mining this area by slicing due to the soft character of the ore encountered. In the central part of the deposit some exploration drifting was done from No. 809 Raise to the North and South and also to the East. Most of this exploring was in Jasper. Adjacent to this exploration and to the Northeast a short drift connection was advanced in ore and Jasper to connect three mill raises that were put up to this elevation for stope development.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND--CONT'D.

c. Stoping - Cont'd.
Subs above the 8th Level - Cont'd.

300' Sub-Level - Cont'd.

At the extreme East end of the orebody a short transfer drift was advanced to the East from No. 821A Raise to the East limit of the orebody. Additional development for a sub-level stope will be done in the latter area early in the coming year to enable stope operations at the East end to be carried below the 7th Level elevation.

275' Sub-Level.

One contract completed stope operations at this elevation in an area near the central part of the deposit. Two small separate stopes were developed in Lloyddale ore, one of which was about 50' in diameter and the other about 20' in diameter. Similarly as on the sub-level above a narrow pillar was left between the stopes when caving from the back occurred in the most Westerly stope. A small amount of exploration and development was done in an area to the East of the area that was stoped. Three mill raises were completed to this elevation from a transfer on the 225' sub-level and a connecting drift in lean ore and ore was driven to connect the mills. A short test drift from one of the mills was advanced to the North in ore and jasper. This development and exploration as on the sub-level above has disclosed only a small amount of ore along the South footwall side.

260' Sub-Level.

One contract did some stoping at this elevation in the area near the central part of the deposit. A stope about 50' x 50' was developed in Lloyddale ore and a short distance to the East a small stope about 20' in diameter was developed leaving a narrow pillar separating the stopes. The balance of the work at this elevation was development and exploration. At the West end of the deposit some sub-level stope development was completed connecting a series of mill raises, but as mentioned previously stope development was abandoned in this area and another raise from the 8th Level was put up to enable mining this area by the slicing method. Near the central part of the deposit East of the stope a total of six mill raises were completed to this elevation from a transfer on the 235' sub-level. A short drift connection was completed in ore connecting three mill raises that were put up from the North side of the transfer. Three mill raises from the South side were also connected at this elevation by means of a small drift in ore and jasper. At the East end of the deposit a transfer drift about 150' in length was advanced from No. 821 Raise extending to the East limit of the orebody. At the end of the transfer a raise was cut out and advanced to the 300' sub-level as part of the development for a stope at the East end of the deposit.

235' Sub-Level.

A small amount of stoping was done in the central part of the deposit at this elevation also. Two separate small stopes were developed in Lloyddale ore leaving a narrow pillar between the stopes.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

c. Stoping - Cont'd.

Subs above the 8th Level - Cont'd.

235' Sub-Level - Cont'd.

Stoping operations were completed in this area late in the year and during the life of the stope, which lasted about 4 months, a high rate of Lloyd-dale production was obtained. Directly West of the stope area a transfer drift was advanced to the Northwest from No. 804 Raise to the West limit of the orebody and for a short distance in footwall material. A number of mill raises were cut out along the North side as development for a stope, but after encountering extremely soft ore that was not suitable for stoping, development was abandoned above here. In December a development contract was employed putting up mill raises along the South side of a transfer drift to the East of No. 809 Raise. Earlier in the year a transfer drift had been completed for a distance of about 100' East of the raise and this was extended in ore for an additional distance of 60'. Additional development will be carried on here to mine a narrow ore area along the South footwall side by means of a sub-level stope.

225' Sub-Level.

Operations on this sub-level during the year were confined entirely to development and a small amount of exploration. A connecting drift in ore and footwall dike was advanced from No. 805 to No. 802 Raise. A transfer drift 175' in length was driven in jasper and ore to the West of No. 808 Raise and a total of seven mill raises were put up along the North side as development for a sub-level stope. To the North and East of the latter raise short exploration drifts were advanced in jasper and a short connecting drift was advanced in jasper to the Southeast to connect with No. 809 Raise.

8th Level.

The work on the 8th Level during the year was confined entirely to development and some exploration which has previously been described under development.

d. Timbering

There was a decrease in the amount of timber used as compared with the previous year due to less contracts employed and as a result of the reduced working schedule that was made necessary late in the year due to the loss of a large number of employees. The amount of poles used increased slightly due to a larger proportion of the product being obtained from slicing operations and more of this material used for covering down the floors of the slices. Substantial increases were made in the price of all timber, poles and lagging in 1944 and this factor accounts for the higher total cost for all timber supplies as compared to the previous year.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

d. Timbering-Cont'd.

Extra large size timber is being used in all the main level ore drifting and in the repair work on the main level to insure longer life. Several intermediate sub-level drifts that serve as airways have continued to require a large amount of repairing due to heavy crushing and also the chute compartments of raises which are subject to wear and some crushing have necessitated frequent repairs. To eliminate interruptions to production repairs in raises have been done during the idle week-end periods whenever possible. The use of hardwood poles in place of tamarack has been employed to a larger extent mainly for spiling and fore-poles in the mining areas. Experience has proven that green hardwood poles serve very satisfactory for this purpose due to higher strength, and this is an important factor wherever slices are being advanced under a new jasper hanging or when settling of the timber mat and falls of ground occur above the timber. Hardwood is also being substituted to a large extent in place of tamarack for cribbing timber particularly where resistance to rotting is not of utmost importance. In long raises like those being put up from the 8th to the 7th Level hardwood cribbing is employed in the upper portion and tamarack in the lower parts of the raise which must serve for considerably longer periods.

The following is a comparative statement of timber for 1944 and 1943:-

	Lineal Feet	Avg. Price Per Foot	Amount 1944	Amount 1943
6" to 8" Cribbing Tbr.	70,681	.0555	3923.41	4185.66
8" to 10" Stull Tbr.	42,562	.1072	4564.51	5305.08
10" to 12" " "	47,882	.1299	6219.93	7687.27
12" to 14" " "	17,956	.1693	3039.56	5492.67
Total Timber 1944	179,081	.0991	17747.41	
Total Timber 1943	232,028	.0977		22870.66
	<u>Per 100 Feet</u>			
7' Lagging	954,422	1.526	14566.17	12283.81
9½' Poles	546,263	2.303	12579.59	9614.74
Wire Fencing	-	-	-	261.00
Total Poles & Fencing	546,263	2.303	12579.59	9875.74
Total Lagging, Poles and Fencing, 1944	1,500,685	1.809	27145.76	-
Total - 1943	1,737,723	1.275	-	22159.55
Product - Tons			376,758	494,042
Feet of Timber per Ton of Ore			.475	.470
Feet of Lagging per Ton of Ore			2.533	2.416
Feet of Lagging per Foot of Timber			5.330	5.146
Cost per Ton for Timber			.0471	.0459
Cost per Ton for Lagging			.0387	.0249
Cost per Ton for Poles and Fencing			.0334	.0200
Cost per Ton for all Timber			.1192	.0908
Equivalent Stull Timber to Board Measure			385,191	486,840
Feet of Board Measure per Ton of Ore			1.022	.985

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

d. Timbering - Cont'd.

The following table shows a comparison of total cost of timbering for the past five years:-

<u>Year</u>	<u>Amount</u>	<u>Cost per Ton</u>
1944	44,893.17	.1191
1943	44,830.23	.0907
1942	33,627.95	.0592
1941	29,187.91	.0523
1940	28,851.64	.0605

e. Drifting and Raising

In spite of the large decrease in the development for sub-level stopes as compared to the previous year, most of the development footage in 1944 was for this purpose and small size sub-level drifts and raises comprises the major portion of this development. Main level drifting and raising was confined to the 7th and 8th Levels and the rock development on these levels was done under E&A CC-86. The large decrease in the total development footage is due to the smaller development program together with a reduction in operating schedule during the latter part of the year.

<u>Year</u>	<u>Drifting</u>			<u>Raising</u>			<u>Grand Total</u>
	<u>Ore</u>	<u>Rock</u>	<u>Total</u>	<u>Ore</u>	<u>Rock</u>	<u>Total</u>	
1944	5439'	899'	6338'	2757'	352'	3109'	9447'
1943	5793'	3518'	9311'	4091'	921'	5012'	14323'

The following table shows a comparison of the development footage excluding the small drift and raise development for sub-level stopes.

<u>Year</u>	<u>Drifting</u>			<u>Raising</u>			<u>Grand Total</u>
	<u>Ore</u>	<u>Rock</u>	<u>Total</u>	<u>Ore</u>	<u>Rock</u>	<u>Total</u>	
1944	1497'	662'	2159'	784'	79'	863'	3022'
1943	1509'	3004'	4513'	1141'	454'	1595'	6108'

The following is the rock development under E&A CC-86:-

	<u>Drift in Rock</u>	<u>Raise in Rock</u>	<u>Total</u>
8th Level	385'	-	385'
7th Level	265'	127'	392'
Total	650'	127'	777'

f. Explosives, Drilling and Blasting

The cost per ton for all explosives used increased materially as compared with the previous year. This was due to the fact that a larger portion of the product was obtained from top slicing operations, in spite of the numerous small scam stopes that were developed during the year including the one relatively large stope in the central part of the crebody.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

f. Explosives, Drilling and Blasting - Cont'd.

The proportion of the product obtained from stoping operations is gradually becoming less due to a decrease in the size of the orebody and lack of areas that can be developed for this system of mining. Another important factor that has effected powder costs is the smaller proportion of Silica grade ore that was produced. Large amounts of this grade of ore have been obtained in the past with a minimum of drilling and blasting, during the last stages of each stope operation when caving of the stope occurred.

Similarly as in the previous year Gelamite No. 1 powder has been used exclusively in the mining and development. A very small amount of gelatine powder of 60% and 80% strength has been tried in several instances when drifting in extremely hard rock. Also a very small quantity of Herculite No. 4 powder was used for blasting the frozen stockpiles at the start of the shipping season early in the year. Herculite powder is favored for this use due to its slow detonating velocity and good results were obtained in blasting the piles with this powder. In all raise work, master fuse lighters have continued to be used with good results in preference to blasting electrically.

The explosives statements are shown under the following headings:-

<u>BREAKING ORE</u>	<u>Quantity</u> <u>Lbs.</u>	<u>Average</u> <u>Price</u>	<u>Amount</u> <u>1944</u>	<u>Amount</u> <u>1943</u>
Gelamite Powder No. 1	168,056	11.50 C	19,325.20	22,125.78
60% Gelatin	265	11.50 C	30.47	104.83
80% Gelatin	-	-	-	57.75
Herculite No. 4	800	10.00 C	80.00	-
Total Powder	169,121	11.49 C	19,435.67	22,288.36
Fuse - Feet	615,038	5.15 M	3,164.96	3,660.95
No. 6 Blasting Caps	95,792	12.20 M	1,168.66	1,267.77
Electric Blasting Caps	75	-	8.21	-
Tamping Bags	2,000	2.15 M	4.30	12.91
Fuse Lighters	17,500	5.49 M	96.03	118.04
Fuse Cartridges	3,500	20.16 M	70.56	62.56
Total Fuse, Caps, etc.,			4,512.72	5,122.23
Total Expense Breaking Ore			23,948.39	27,410.59
Product - Tons			376,578	494,042
Lbs. Powder per ton of Ore			.449	.393
Cost per Ton for Powder			.052	.045
Cost per Ton for Fuse, Caps, etc.,			.011	.010
Cost per Ton for all Explosives			.063	.055

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

f. Explosives, Drilling and Blasting, Cont'd.

DEVELOPMENT IN ROCK*

Gelamite Powder No. 1	5,333	11.50 C	613.22	680.00
60% Gelatin	4,308	7.89 C	495.42	-
Total Powder	9,641		1,108.64	680.00
Fuse - Feet	18,450	5.15 M	94.86	75.30
No. 6 Blasting Caps	2,574	12.20 M	31.40	25.76
Fuse Lighters	900	5.49 M	6.04	5.40
Total Fuse, Caps, ect.			132.30	106.46
Total all Explosives			1,240.94	786.46
Rock Drifting - Feet			1,021'	1,064'
Cost per Foot for Powder			1.085	.639
Cost per Foot for Fuse, Caps, etc.			.129	.10
Cost per Foot for all Explosives			1.214	.739
Grand Total Exp. used in Mine			25,189.33	28,197.05
Cost per Ton all Explosives Used			.067	.057
Average Price per Lb. for Powder			.1149	.1148

* Exclusive of work chargeable to Explorations, Ventilations and E & A's.

g. Ventilation

With minor exceptions ventilation conditions within the mine have been quite satisfactory throughout the year. The fan on the 4th Level at Section 6 shaft has continued in operation 24 hours daily exhausting the air up the Section 6 shaft during the summer months and during the freezing weather the direction of the flow of air was reversed to exhaust through the Lloyd shaft. By following this procedure, no trouble has been experienced by the formation of ice in the hoisting shaft. Also during the winter months the direction of the flow of air is reversed for short intervals during the blasting period on nearly every shift to remove the smoke through the Section 6 shaft and this practice also prevents heavy ice formation in the latter shaft. Ventilation surveys of the underground workings were made twice in 1944 and the total volume delivered by the main fan has averaged approximately 20,000 c.f.m.

On a number of occasions when driving development headings that were a substantial distance from airways, booster fans were used and metal pipe or vent-tubing extended from the fan to the heading to supply ventilation. In several mining areas at the East end of the deposit it was necessary several times to install booster fans near the raise to provide adequate ventilation at the working place.

Upon completion of the 8th Level drift to the East limit of the orebody No. 821 Raise was put up to the 7th Level elevation and as mentioned previously this raise is serving as an important ventilation connection between the levels. Also about midway in the ore area No. 811 Raise was put up from the short Northeast crosscut to the 7th Level elevation and is serving as another ventilation connection between the levels. Both of the latter raises are in ore and in addition to serving for ventilation will be used for mining purposes as mining above the 7th Level reaches lower elevations.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND-CONT'D.

g. Ventilation-Cont'd.

At the West end of the ore area raises that were put up for mining purposes from the 8th to the 7th Level also serve for ventilation purposes. A permanent rock ventilation raise No. 780 was put up from the 7th to the 6th Level in the slate footwall West of the orebody early in the year. This raise was put up to replace No. 701 Raise which was partly in ore and aserved as an airway until it was involved in caving caused by mining at the 7th Level elevation. At the East end of the deposit a raise in the North footwall that was put up several years ago continues to serve as a second important airway between the 7th and 6th Levels. On various sub-levels above the 7th Level short drift connections were advanced in ore and footwall material to connect with nearby airways to provide good ventilation in the mining areas. At the West end of the deposit as mining progressed below the 7th Level elevation short dirft and raise connections were advanced from the slicing area to connect with existing 7th Level development for ventilation and travelling purposes. When stope operations were underway in the Silicious ore area in the central part of the deposit early in the year a small drift was advanced in jasper to the Northwest of No. 714 Raise to connect with a mill raise that extended to the 6th Level elevation. This connection served during the remaining life of the stope as an airway and travelling road. On the 6th Level a short drift connection was advanced in slate to the South from the main haulage drift to connect with No. 780 Raise from the 7th Level. No other connections for ventilation purposes were driven on the 6th Level elevation. Two rock raises from the 6th to the 5th Level continue to serve as permanent ventilation connections and two rock raises from the 5th to the 4th Level are being maintained as permanent airways. On the 4th Level some re-timbering was necessary to maintain a portion of the old footwall drift which connects to the shaft and serves as an important airway.

8. COST OF OPERATING

a. Comparative Mining Costs

	<u>1944</u>	<u>1943</u>	<u>Increase</u>	<u>Decrease</u>
Product Tons	376,758	494,042		117,284
Underground Costs	1.694	1.556	.138	
Surface Costs	.258	.178	.080	
General Mine Expense	.343	.336	.007	
Cost of Production	2.295	2.070	.225	
Depreciation	.210	.126	.084	
Taxes	.052	.065		.013
Loading and Shipping	.052	.079		.027
Total Cost at Mine	2.609	2.340	.269	
Budget Estimated at Mine	2.471	2.204	.267	
No. of Shifts & Hours	26-1-8 Hr.	47-1-8 Hr.		
	50-2-8 Hr.	4-2-8 Hr.		
	209-3-8 Hr.	255-3-8 Hr.		
Total 8 Hr. Operating Shifts	285	306		21
Average Daily Product	1,223	1,816		593

LLOYD MINE
ANNUAL REPORT
YEAR 1944

8. GOST OF OPERATING-CONT'D.b. Detailed Cost Comparison

	<u>1944</u>		<u>1943</u>	
	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>
1. Exploring in Mine	12,226.18	.032	15,413.33	.031
3. Development in Rock	10,880.59	.029	8,619.00	.018
4. Development in Ore	54,274.82	.144	66,623.67	.135
5. Stopping	228,254.14	.605	285,246.93	.577
6. Timbering	171,787.78	.456	210,075.92	.425
7. Tramming	64,447.53	.171	82,166.25	.166
8. Ventilation	1,354.08	.004	5,504.32	.011
9. Pumping	10,403.14	.028	12,082.38	.025
10. Compressors & Air Pipes	24,185.94	.064	26,801.56	.054
11. Back Filling				
12. Underground Supt.	23,625.36	.063	21,803.07	.044
14. Maint. Comp. & Power Drills	735.80	.002	1,686.63	.003
15. Scrapers & Mech. Loaders	13,058.88	.035	12,773.69	.026
16. Electric Tram Equipment	19,922.29	.053	19,061.41	.039
17. Pumping Machinery	3,016.37	.008	975.69	.002
Total Undg. Costs	638,172.90	1.694	768,833.85	1.556
18. Hoisting	29,514.99	.078	31,184.81	.063
19. Stooking Ore	18,060.26	.048	14,843.66	.030
20. Screening, Crushing at Mine	253.63	.001	536.12	.001
21. Dry House	10,721.56	.028	10,290.68	.021
22. General Surface Expense	14,519.82	.038	16,300.73	.033
23. Maintenance Hoisting Equipt.	13,284.77	.035	9,096.45	.018
24. Shaft	2,484.51	.007	2,560.66	.005
25. Top Tram Equipment	2,579.29	.007	11,424.89	.003
26. Docks, Trestles & Pockets	4,846.05	.013	1,377.62	.003
27. Mine Buildings	1,061.44	.003	370.36	.001
Total Surface Costs	97,126.32	.258	87,985.98	.178
Vacation Expense	14,122.50	.037	13,513.84	.027
28. Insurance	3,712.81	.010	4,335.42	.009
29. Mining Engineering	2,804.56	.007	3,299.30	.007
30. Mech. and Elec. Engineering	1,379.18	.004	1,399.58	.003
31. Analysis & Grading	15,730.39	.042	16,780.82	.034
32. Personal Injury	25,117.54	.066	30,918.08	.062
33. Safety Department	1,592.29	.004	2,257.83	.005
34. Tel. & Safety Devices	3,103.22	.008	3,086.96	.006
35. Local and Gen. Welfare	5,552.80	.015	6,617.67	.013
36. Special Expense and Allow.	5,964.54	.016	28,946.08	.059
37. Ishpeming Office	15,375.96	.041	19,050.68	.039
38. Social Security	12,968.58	.034	16,326.60	.033
39. Mine Office	20,720.40	.055	19,335.19	.039
Total Gen. Mine Expense	129,494.62	.343	165,868.05	.336
Cost of Production	864,793.84	2.295	1,022,687.88	2.070
40. Taxes	19,434.42	.052	32,133.05	.065
Total Cost	884,228.26	2.347	1,054,820.93	2.135
Budget Estimated Cost		2.471		2.204

LLOYD MINE
ANNUAL REPORT
YEAR 1944

8. COST OF OPERATING-CONT'D.b. Detailed Cost Comparison - Cont'd.

	<u>1944</u>		<u>1943</u>	
	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>
41. General Supplies	18,484.09	.049	17,563.30	.036
42. Iron and Steel	10,361.67	.027	7,717.31	.016
43. Oils and Greases	1,744.76	.005	1,753.46	.003
44. Machinery Supplies	7,492.17	.020	10,052.28	.020
45. Explosives	25,189.33	.067	28,703.97	.058
46. Lumber and Timber	49,806.56	.132	49,065.60	.099
47. Fuel	2,612.35	.007	2,537.02	.005
48. Electric Power	43,762.77	.116	49,440.07	.100
49. Sundries	37,747.16	.100	36,522.49	.074
50. Other Mines & Accounts				
Total Supplies	197,120.20	.523	202,645.16	.410

The following is an explanation of comparative cost accounts that show significant variation.

1. Exploring in Mine

The decrease is due to less footage of exploration drilling with less bit costs and labor charged to this account.

3. Development in Rock

Increase in this account due to more development drifting and raising in rock charged to operating as compared with rock development charged to E&A CC-86 in previous year.

4. Development in Ore

Decrease due to less sub-level stope development.

5. Stoping

Decrease in total expense and increase in cost per ton due to smaller product and larger proportion of product obtained from top slicing operations.

	<u>1944</u>		<u>1943</u>	
	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>
General Supplies	7,796.08	.023	7,431.07	.017
Iron and Steel	3,796.16	.011	1,799.41	.004
Oil and Greases	373.16	.001	256.43	.001
Machinery Supplies	244.44	.001	372.90	.001
Explosives	18,378.50	.054	20,546.80	.046
Timber and Lumber	1.80	.000	1.42	.000
Electric Power	4,352.03	.013	4,407.71	.010
Sundries	7,036.91	.021	8,262.38	.018
Expense Accounts	1,260.02	.004	1,324.08	.003
Total	43,239.10	.128	44,402.20	.100

LLOYD MINE
ANNUAL REPORT
YEAR 1944

8. COST OF OPERATING-CONT'D.

b. Detailed Cost Comparison - Cont'd.

	1944		1943	
	Amount	Per Ton	Amount	Per Ton
Payroll Labor	173,117.83	.511	227,048.00	.506
Cliffs Shaft Labor	23.30	.000	23.84	.000
Gen. Shops Labor	1,336.81	.004	1,210.84	.003
Shops, Labor etc.	10,537.10	.031	12,562.05	.027
Total Labor	185,015.04	.546	240,844.73	.536
Grand Total	228,254.14		285,246.93	
Production Tons Stopped	3,390.20		4,483.46	
Avg. Miners Rate for Stopping	8.54		8.70	
Avg. Tons per Man Stopping	19.19		19.66	

6. Timbering

Increase in cost per ton due to larger amount of timber used on account of expansion of slicing operations and substantial increases made in cost of timber, poles and lagging.

7. Tramming

Large decrease due to smaller product and less repairs to equipment.

8. Ventilation

Decrease due to less rock ventilation connections driven during the year and less maintenance cost to ventilating equipment.

9. Pumping

Decrease due to substantial reduction in total volume of underground water pumped as compared with the previous year. A large part of the storage trench on the 8th Level has been converted into a sump and two centrifugal pumps, one of which was purchased in 1944, are used to pump the water from this level to the 7th Level, where it is combined with the 6th and 7th Level water and diverted to the Morris Mine. Weirs are used on the 7th and 8th Levels to measure the total volume of water diverted to the Morris Mine, and there was a material decrease in this volume of water as compared with the previous year. This accounts for a large portion of the reduced pumping costs in 1944. The following table shows a comparison for the past five years of the mine water pumped by the Inland Steel Company and the proportion charged to the Lloyd Mine.

Year	<u>Total Inland Steel Co.</u>			<u>G.C.I. Co. Prop.</u>		
	Amount	Percent	Avg. Gals Per Minute	Amount	Percent	Avg. Gals Per Minute
1944	59,011.80	91.62	887.9	5,393.50	8.38	81.1
1943	64,159.88	89.87	932.0	6,577.81	10.13	104.9
1942	42,644.22	86.00	847.1	7,013.13	14.00	101.0
1941	60,245.97	93.22	898.4	4,225.35	6.78	66.0
1940	70,978.13	90.13	1155.4	7,769.69	9.87	125.1

LLOYD MINE
ANNUAL REPORT
YEAR 1944

8. COST OF OPERATING-CONT'D.

b. Detailed Cost Comparison - Cont'd.

The following table shows a distribution of the total Lloyd Mine water pumped.

	<u>Average Gallons per Minute</u>	
	<u>1 9 4 4</u>	<u>1 9 4 3</u>
Second Level Water Supply	33.0	32.5
Fifth Level Water Supply	64.7	91.4
Seventh Level to Morris Mine	<u>61.1</u>	<u>104.9</u>
Total	178.8	228.8

The decrease in mine water is due to relatively light snow fall during the winter 1943-44, resulting in a smaller spring run-off, and due to this the seasonal peak in mine water which is usually reached in June and July did not materially exceed the average volume during the other months of the year. Similarly as in the previous years the 2nd Level water was not sufficient to supply the demand for water for the Location and mine use, and it was necessary to divert a large amount of water for this purpose from the No. 8 surface well at the Morris Mine.

15. Scrapers & Mechanical Loaders

Increase due to considerably more maintenance cost in spite of the fact that no new equipment other than spare parts were purchased during the year.

16. Electric Tram Equipment

Increase due mainly to more repairs to cars and rebuilding one underground locomotive.

17. Pumping Machinery

Increase due to purchase of one 250 G.P.M., 300' head centrifugal pump for the 8th Level and also purchase of abrasive resistant parts for the spare pump on the same level.

19. Stocking Ore

Increase due to higher cost of materials used in trestle construction.

22. General Surface Expense

Decrease due to smaller labor force required on account of less shipments and smaller product.

23. Maintenance Hoisting Equipment

Large increase in this account due mainly to costs of repairing serious breakdown of this equipment in May when head sheave axle broke.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

8. COST OF OPERATING-CONT'D

b. Detailed cost comparison-Cont'd.

25. Top Tram Equipment

Increase in this account due to rebuilding two tram cars, one of which was badly wrecked when it fell off the trestle.

26. Docks, Trestles and Pockets

Large increase due to rebuilding permanent trestle approach on West side of shaft and also rebuilding skip dumps and chutes below the dump.

27. Mine Buildings

Increase due to more repairs required.

9. EXPLORATION AND FUTURE EXPLORATIONS

A diamond drilling program has been continued throughout the year in an attempt to disclose additional reserves. The Gopher Drill has been employed mostly in exploring the extent of known ore above and below the 8th Level with relatively short holes, and the Deep Hole drill has been used to explore the area to the Southeast of the Lloyd deposit from the 8th Level. The overall results of the program have continued to be disappointing, as no ore of significance has been discovered, excepting the favorable vertical extension of the known ore below the 8th Level. Correlation of available information on the geological structure to the Southeast of the Lloyd deposit indicates favorable possibilities for concentration, but the drilling completed into this area to date has disclosed only several very short runs of standard grade ore. A run of 23' of standard grade ore was encountered in one of the deep holes drilled into the latter area during the year and it is planned to explore this ore further by means of a drift on the 8th Level. In the previous year an inclined hole from the 7th Level encountered a short run of ore adjacent to this ore and the drift will enable further exploration to be continued in both areas. Some high sulphur ore has been encountered in the drilling at two widely separated points at a depth of more than 200' below the 8th Level and some deep hole drilling below the bottom level will be necessary to determine the extent of the high sulphur ore and whether any standard grade ore occurs at lower elevations. The exploration drilling completed to date has about exhausted the possibility of discovering any ore of importance in the area surrounding and adjacent to the Lloyd deposit above the 8th Level and hope for disclosing any substantial tonnage of additional ore seems now to be dependent on drilling to lower depths.

Exploration with the Gopher Drill has proven a favorable vertical extension of the known ore to a depth of 165' below the 8th Level, but development and drilling has disclosed only a very narrow width to the orebody on the 8th Level and below.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

9. EXPLORATIONS AND FUTURE EXPLORATIONS--CONT'D.

Late in the year drilling was started on the 8th Level into the area directly South of the Lloyd deposit where short runs of ore were encountered in two drill holes at the 7th Level elevation. The drilling program will be continued during the coming year for the purpose of exploring further the extent of the Lloyd deposit below the 8th Level and also exploration in the surrounding and adjacent area. Development for mining the ore below the 8th Level is being considered and the means, either by sinking the Lloyd shaft or sinking a winze will be determined largely on the basis of the tonnage of ore reserves that can be disclosed below this level.

The following is a comparison of the costs and the footage drilled during the year.

	<u>Feet</u>	<u>Cost per Foot</u>	<u>Total</u>
Deep Hole Drill	1918'	\$ 4.029	\$ 7,728.38
Gopher Drill	1309'	3.436	4,497.80
	3227'	\$ 3.789	\$ 12,226.18

The following is a log of the drilling with the Gopher Drill.

<u>D.D.H. No. 159</u>		<u>D.D.H. No. 163</u>	
<u>8th Level - Dip 0°-North</u>		<u>8th Level - Dip 0°</u>	
<u>Depth</u>	<u>Material</u>	<u>Depth</u>	<u>Material</u>
0' - 7'	Tr. Slate & Jas.	0' - 16'	Lean Ore
7' - 20'	Slate	16' - 165'	Ore
		165' - 171'	Lean Ore
		171' - 172'	Dike
<u>D.D.H. No. 160</u>		<u>D.D.H. No. 164</u>	
<u>8th Level - Dip 0°-South</u>		<u>7th Level - Dip 0°-S.E.</u>	
<u>Depth</u>	<u>Material</u>	<u>Depth</u>	<u>Material</u>
0' - 25'	S.O.J.	0' - 172'	Slate
25' - 45'	Ore	172' - 190'	Tr. Sl. & Jas.
45' - 70'	Dike	190' - 206'	S. O. J.
70' - 95'	S.O.J.		
95' - 106'	Hard Blue Jas.	<u>D.D.H. No. 166</u>	
106' - 115'	Lean Ore	<u>7th Level - Dip 0°-S.W.</u>	
115' - 120'	S.O.J.	<u>Depth</u>	<u>Material</u>
120' - 149'	Slate	0' - 135'	Slate
		135' - 142'	Tr. Sl. & Jas.
		142' - 152'	S. O. J.
		152' - 164'	Dike
		164' - 168'	S.O.J.
		168' - 169'	Dike
		169' - 189'	S. O. J.
		189' - 193'	Hard Blue Jas.
<u>D.D.H. No. 161</u>			
<u>Depth</u>	<u>Material</u>		
<u>300' Sub - Dip 0° North</u>			
0' - 25'	Jas. and L.O.		
25' - 31'	Ore		
31' - 68'	Lean Ore		
68' - 79'	Slate		
<u>D.D.H. No. 162</u>			
<u>8th Level - Dip 0°</u>			
<u>Depth</u>	<u>Material</u>		
0' - 15'	S. O. J.		
15' - 100'	Ore		
100' - 106'	Ore & Ferr. Sl.		
106' - 132'	Slate		

LLOYD MINE
ANNUAL REPORT
YEAR 1944

9. EXPLORATIONS AND FUTURE EXPLORATIONS-CONT'D.

<u>D.D.H. No. 167</u>	
<u>8th Level - Dip 50° South</u>	
<u>Depth</u>	<u>Material</u>
0' - 48'	Slate
48' - 50'	Ore & Sl. Seams
50' - 132'	Ore
132' - 165'	Dike
165' - 215'	Jas. & L. O.
215' - 235'	Dike
235' - 245'	Lean Ore
245' - 320'	High Sul. Ore
320' - 330'	Ore
330' - 332'	S. O. J.
332' - 348'	Slate

<u>D.D.H. No. 170</u>	
<u>8th Level - Dip 0° South</u>	
<u>Depth</u>	<u>Material</u>
0' - 10'	S. O. J.
(Not Completed)	

The following is a log of the drilling with Deep Hole Drill.

<u>D.D.H. No. 165</u>	
<u>8th Level - Dip 0°-S.E.</u>	
<u>Depth</u>	<u>Material</u>
0' - 648'	Slate
648' - 672'	Dike
672' - 777'	Slate
777' - 797'	Tr. Sl. & Jas.
797' - 818'	L. O. & Jas.
818' - 828'	Ore
828' - 860'	Lean Ore
860' - 976'	S. O. J.
976' - 978'	Dike
978' - 1045'	S. O. J.

<u>D.D.H. No. 169</u>	
<u>8th Level - Dip 0°-S.E.</u>	
<u>Depth</u>	<u>Material</u>
0' - 204'	Slate
204' - 249'	Dike
249' - 279'	Slate
279' - 292'	Ore
292' - 471'	Slate
471' - 499'	Tr. Sl. & Jas.
499' - 529'	S. O. J.
(Not Completed)	

<u>D.D.H. No. 168</u>	
<u>8th Level - Dip 0°-S.E.</u>	
<u>Depth</u>	<u>Material</u>
0' - 146'	Slate
146' - 177'	Dike
177' - 344'	Slate

LLOYD MINE
ANNUAL REPORT
YEAR 1944

10. TAXES

The following figures show a comparison of the taxes paid in 1944 and 1943 in Ishpeming Township.

	<u>1944</u>		<u>1943</u>	
	<u>Valuation</u>	<u>Taxes</u>	<u>Valuation</u>	<u>Taxes</u>
<u>Lloyd & Section 6</u>				
SW $\frac{1}{4}$ of NW $\frac{1}{4}$ of Sec. 6, 47-27)				
40 Acres, N $\frac{1}{2}$ of SW $\frac{1}{4}$ of Sec 6)				
47-27, 81.67 Acres, N $\frac{1}{2}$ of SE $\frac{1}{4}$)				
of Sec. 6, 47-27, 80 Acres)	560,000	10,191.72	890,000	13,790.91
Personal, Ore in Stock,				
Supplies and Equipment	495,000	9,008.75	660,000	10,226.96
Total by State Tax Comm.	1,055,000	19,200.47	1,550,000	24,017.87
Collection Fees		192.01		240.18
Total Taxes		19,392.48		
<u>CCICo. Misc. Lands</u>				
S $\frac{1}{2}$ of NE $\frac{1}{4}$ of Sec. 6, 47-27	320	5.82	320	4.96
SE $\frac{1}{4}$ of NE $\frac{1}{4}$ of Sec. 6, 47-27)	350	6.37	350	5.42
S $\frac{1}{2}$ of SW $\frac{1}{4}$ of Sec. 6, 47-27)	700	12.74	700	10.85
SW $\frac{1}{4}$ of SE $\frac{1}{4}$ of Sec. 6, 47-27)	350	6.37	350	5.42
SE $\frac{1}{4}$ of SE $\frac{1}{4}$ of Sec. 6, 47-27)	575	10.46	575	8.91
Total	2,295	41.76	2,295	35.56
Collection Fees		.42		.36
Total CCICo. Misc. Lands		42.18		35.92
Total Lloyd	1,057,295	19,434.66	1,552,295	24,293.97
Taxes Lot 4 Block 2 W. Ishp.	50	.91	50	.78
<u>North Lake Dwellings</u>				
Houses on Sec. 6, 47-27	4,500	81.90	4,500	69.73
Collection Fees		.82		.70
Total Dwellings		82.72		70.43
Total Ishpeming Township	1,061,845	19,518.29	1,556,845	24,365.28
Rate		1.81995		1.54954

The decrease in taxes was due to a substantial reduction in valuation due to diminishing ore reserves and also a reduced value on personal property. However there was a material increase in the tax rate as compared with the previous year.

	<u>1944</u>	<u>1943</u>	<u>1942</u>	<u>1941</u>	<u>1940</u>
Taxes per ton produced	.052	.049	.069	.082	.099
Taxes per ton shipped	.070	.043	.067	.099	.093

LLOYD MINE
ANNUAL REPORT
YEAR 1944

11. ACCIDENTS AND
PERSONAL INJURY

The accident frequency and severity rate in 1944 was considerably worse than in the previous year. This was due to one regrettable fatality and sixteen compensable accidents as compared with ten compensable accidents in 1943. A reduction in the operating schedule effective July 1, from sixteen shifts to fifteen shifts per week, together with the loss of a large number of employees due to quitting and being drafted into the services accounts for the large decrease in total man days worked from 92,895 in 1943 to 74,932 in 1944. The total man days lost on account of accidents was 7178 as compared with 6740 in 1943. (One fatality 6000 days.)

The following table shows a comparison of the accident frequency and severity rates for the past two years.

<u>Year</u>	<u>Frequency Rate</u>	<u>Severity Rate</u>
1944	28.36	11.97
1943	14.80	9.071

Frequency Rate - Number of accidents per 1,000,000 man hours

Severity Rate - Number of days lost per 1,000 man hours.

The compensable accidents are listed in detail as follows:-

Accident No. 834, February 9, 1944, Walter Lammakka - Brakeman. While operating a locomotive he was thrown off the motor by the force of a collision with another locomotive when going around a turn in the haulage drift on the 8th Level. - Fracture of Lower Jaw - Time lost - 63 days.

Accident No. 835, February 21, 1944, Clifford Ayotte - Miner. Struck on right hand by piece of blocking that fell from back of slice while he was shoveling a hitch. - Fracture of second and third metacarpals, right hand - Time lost - 72 days.

Accident No. 836, March 9, 1944, William Nelson - Cage Rider. Squeezed thumb between two rails as he was helping to pull rails on plat from underneath cage on the 8th Level. - Fracture of first joint of thumb, left hand - Time lost - 33 days.

Accident No. 837, March 27, 1944, Theodore Sheppard - Top Lander. While barring a door open on a top tram car on the trestle, the bar slipped, causing him to fall about 20' onto the frozen stockpile. Compound fracture of first lumbar vertebrae and fracture lower end left tibia - Time lost - 312 days - estimated.

Accident No. 838, April 12, 1944, Jacob Pari - Miner. Fell about 40' in raise when stage that he was standing on collapsed when stage pole was broken by piece of cribbing timber that slipped out of his hand. Fractured rib, right side - Time lost - 78 days.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

11. ACCIDENTS AND
PERSONAL INJURY-CONT'D.

Accident No. 840, May 17, 1944, Thomas Honkala - Miner. While standing under a raise a piece of ore fell down the ladder road and struck him on the right knee. Contusion of right knee - Time lost - 12 days.

Fatality, Accident No. 841, June 9, 1944, Julius LaFreniere - Miner. This man received serious injuries when struck by a fall of ground and died 8 days later at the Ishpeming Hospital. LaFreniere was engaged in putting up a raise from the 8th Level and while trimming loose ground he was caught by the fall of a large chunk from the back - (6000 Days)

Accident No. 842, June 12, 1944, Harold Williams - C/A Miner. While loading cars from a chute a piece of wood came through the chute and struck him in the chest. Contusion of chest, separation of cartilage. Time lost - 29 days.

Accident No. 843, July 24, 1944, Nestor Korpi - Miner. Struck by a fall of ground while trimming back of a transfer drift after a blast. Fracture of tibia and anterior border of body of 5th lumbar. Lateral compression of body of 3rd lumbar vertebrae and laceration of both legs. - Estimated time lost 312 days.

Accident No. 844, August 31, 1944, John Kallio - Miner. While climbing down ladder way in raise a small piece of falling ore struck him in the right eye. Laceration of lower lid right eye and contusion of eyeball - Time lost - 8 days.

Accident No. 846, October 31, 1944, Pasquale Meni - C/A Miner. While breaking a chunk with a pick the pick glanced and struck him on the instep of the right foot. Puncture wound with fracture of second metatarsal bone - Time lost - 40 days.

Accident No. 847, September 22, 1944, Theodore Patron - Chuteman. While loading cars at a chute the disc handle turned suddenly causing him to strike his elbow on edge of car. Bursitis of elbow - Time lost - 26 days.

Accident No. 848, November 2, 1944, Victor Tasson - Motorman. While dumping cars at shaft with air left, he attempted to loosen a stuck piston rod with a piece of drill steel and the piston was suddenly forced out, pinning the index finger of his right hand against the car handle. Fracture of index finger right hand. - Time lost - 32 days.

Accident No. 849, November 11, 1944, Roy Coduti - Skip Tender. He was approaching the pockets with a locomotive and wrenched his wrist when he tried to protect himself from a projecting pipe on another locomotive that was parked over the pockets. Epiphyseal separation, left wrist. - Time lost - 48 days.

Accident No. 850, December 12, 1944, Theodore Klinghammer - C/A Miner. Crushed by piece of timber that was being pulled into place while constructing timber pillar. Contusion of shoulder and chest. - Estimated lost time - 60 days.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

11. Accidents and Personal Injury, Cont'd.

Accident No. 851, December 15, 1944, Pasquale Meni - C/A Miner. Squeezed finger in dry house door as he was leaving to go on shift. Amputation of tip of distal phalanx of ring finger on left hand. - Estimated lost time - 36 days.

12. NEW CONSTRUCTION AND PROPOSED NEW CONSTRUCTION.

There was no new construction during the year, but some repairs undertaken were of a major nature. The permanent wood trestle approach to the West of the shaft was completely rebuilt, due to the rotted condition of the timber bents which had been in service for many years. A new permanent trestle covered with 3" fir decking was erected, replacing the badly rotted approach directly West of the shaft. Upon completion of the new permanent trestle, a number of bents were erected to the West of the shaft to provide stocking capacity for Silica grade ore after the East stocking area for this grade was filled to capacity. Similarly as in previous years, three separate trestles that branch and roughly parallel each other were erected to the East of the shaft after the Lloyddale grade that is stocked in this area was loaded out.

Due to rusting and wear, the skip dump in the headframe was practically rebuilt. The major part of this work was done by a crew of steel workers during one week-end period and the balance completed on subsequent week-ends. A number of the main steel channel iron support for the dump were replaced and new steel plate installed throughout the dump and chutes directly below. Wear and rusting had weakened the entire structure to such an extent that replacement and repairs became necessary.

A new roof was installed on the water supply reservoir tank that is located on high ground North of the Location. The original roof of 1 $\frac{3}{4}$ " matched hemlock lumber covered with several layers of composition roofing paper had deteriorated to such an extent that there was danger of it collapsing into the tank from snow loads in the winter months. The old roofing was removed and a new roof of $\frac{3}{4}$ " matched fir lumber covered with a heavy mule-hide roofing was installed. The 300,000 gallons capacity concrete tank was drained while this work was being done and the bottom and sides were thoroughly cleaned. Some neat cement was also applied along the sides to seal numerous old leaks.

Only minor repairs to several of the surface buildings were necessary to maintain them in good condition.

No important new construction is anticipated during the coming year.

13. EQUIPMENT AND PROPOSED EQUIPMENT

The following is a list of the more important items of new equipment that were added to the inventory in 1944

<u>Number of Items</u>	<u>Items</u>	<u>Cost</u>
1	2MRV30 I.R. Motorpump	\$ 689.93
1	RB12 Jackhammer	200.75
2	HC20D Auger Drill	380.00
1	326 RW-650 Woodborer	176.46
1	Unit Heater	75.92
1	Compressor Circulating Pump	86.50
2	Steel Lined Sheaves (8' Dia.)	1310.00
4	C.I. Head Sheave Bearings	447.00

LLOYD MINE
ANNUAL REPORT
YEAR 1944

13. EQUIPMENT AND PROPOSED EQUIPMENT-CONT'D.

Two 65' Cu. Ft. Rocker Dump Cars were sold to the Princeton Mine in 1944 and it is planned to transfer a 7 ton General Electric underground locomotive to the Spies-Virgil Mine early in 1945.

14. MAINTENANCE AND REPAIRS

a. There was an increase in maintenance expense of some equipment in spite of the reduced operating schedule that was in effect during the last half of the year. A breakdown of the Einco Loader which has been used exclusively in main level drifting operations required major repairs and some extensive repairs were also made to several scraper hoists. No new scraper hoists were purchased in 1944, but due to a reduction in the number of mining contracts, additional scraper hoists have become available for spares. However, most of these units have been in service for a number of years and consequently require more frequent repairs. One underground locomotive that was damaged was completely overhauled and repaired at the General Shops.

The large expense for maintenance of hoisting equipment was due to the breakdown that occurred when the axle on the sheave for the North skip rope broke, causing the rope to break and the North skip to drop about 200' to the bottom of the shaft. This breakdown resulted in a delay to hoisting as previously mentioned and necessitated extensive repairs to the steel work at the top of the shaft house and also the shaft timber at the bottom of the shaft. Two 8' diameter head sheaves were badly damaged and were replaced with new sheaves.

Excluding the damage to the shaft on account of the above breakdown, maintenance work in the shaft during the balance of the year was confined to routine replacement of worn out runners and also the hardwood wearing strips on the sides of the runners in both skip roads. Shaft inspection during the mid-week and week-ends have been continued and is of material advantage in maintenance of the shaft.

Top tram equipment required more maintenance than during the previous year due mainly to rebuilding one top tram car that was badly wrecked when it was derailed and fell off the trestle.

A program of repairs to timbered drifts in the main levels and sub-levels and also repairs to raises has been continued throughout the year at about a normal rate. Repair work in the drifts has been confined mostly to the 7th Level and subs above and consisted mostly of installing lining sets and replacing rotted timber sets. Repairs in mining raises have been frequently necessary due to wear in the chute compartments and relining this compartment with 2" hardwood plank has comprised most of the work.

b. Location

1. General Maintenance

There was a small decrease in the expense for location maintenance as compared with the previous year. The largest expense, the same as last year was the pumping costs for the location water supply. A bad leak in the wood main from the reservoir tank to the location was also repaired.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

14. MAINTENANCE AND REPAIRS-CONT'D.

b. Location - Cont'd.

	<u>Labor</u>	<u>Supplies</u>	<u>Total</u>
Water		4,100.37	4,100.37
Fire Protection	33.41	25.99	59.40
Ice Rink	19.81	13.23	33.11
Water Piping	116.99	21.80	138.79
Fencing	27.04		27.04
Total	\$ 197.32	\$ 4,161.39	\$ 4,358.71

The following table shows a comparison of total maintenance expense for the past five years:-

<u>Year</u>	<u>Amount</u>
1944	\$ 4,358.71
1943	4,433.54
1942	4,439.13
1941	6,261.66
1940	4,720.39

2. Rented Buildings

There was a considerable increase in maintenance expense on rented buildings in 1944, and this expenditure was confined mostly to repairs and renovating the residence for the Superintendent of the Mather Mine. The store building in the location which is being rented as in previous years required some minor repairs to the roof. During the hot summer weather some patching with mule-hide roofing was done and a coat of asphalt applied. The display windows in front were weather stripped and some hardwood flooring was laid inside to replace a badly worn section. Some additional repairs to the front of the building will be necessary during the coming year due to rotting of the window casings, and some painting will also be required.

The old frame garage at the rear of the store building was sold and removed from the premises. This structure was not used for any purpose for many years and it was rapidly deteriorating. There was no sale for the two remaining location dwellings during the year and these have continued to be rented.

The following table shows a comparison of expenditures on rented buildings during the past five years:-

<u>Year</u>	<u>Amount</u>
1944	\$ 3,290.52
1943	737.91
1942	360.90
1941	1,145.53
1940	4,323.23

The North Lake Club House required very little maintenance similarly as in 1943. There was a slight increase in the operating deficit as compared with the previous year as indicated by the following table. This is due to the large number of young men who were called into the service, resulting in less membership fees collected and a reduction in receipts from the Club House facilities.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

14. MAINTENANCE AND REPAIRS-CONT'D.2. Rented Buildings-Cont'd.

<u>Year</u>	<u>Proportion of Operating Deficit</u>		
	<u>Lloyd Mine</u>	<u>Inland Steel Co.</u>	<u>Total</u>
1944	\$ 2,569.79	\$ 960.00	\$ 3,529.79
1943	2,500.43	960.00	3,460.43

15. POWER

There were no delays to operations in 1944 due to lack of electric power. The reduced operating schedule accounts for a decrease in total K.W.H. as compared with the previous year, but there was a slight increase in the rate per K.W.H. The following is a five year comparison of power consumption and costs:-

<u>Year</u>	<u>K.W.H.</u>	<u>Cost</u>	<u>Rate</u>
1944	3,090,000	\$ 44,655.12	.0145
1943	3,633,600	50,699.76	.0139
1942	3,751,200	52,200.96	.0139
1941	3,631,200	50,289.84	.0138
1940	2,516,400	36,282.72	.0144

16. WATER SUPPLY

As in previous years the amount of water pumped from the 2nd Level at the Lloyd Mine was insufficient to supply the demand for the Location and Mine purposes. Each day excepting Sundays and Holidays, the water supply is augmented daily by diverting water from the Morris Mine No. 8 Well. This source now provides a major portion of the supply.

Late in the year a bad leak developed in the old 4" wood main from the reservoir tank to the location. Two 20' lengths of standard 6" wrought iron pipe were laid to replace a poor section of the wood main where the leak occurred. The old main crosses over an area that is being mined and very likely it will necessitate replacement in the near future, due to extension of the surface cave.

The chlorinators for the well water and also the 2nd Level water have continued to give dependable service.

17. CONDITION OF PREMISES

The premises have been maintained in good condition, the lawn and flower garden especially have been maintained in a very attractive appearance during the summer months. The shrubbery and trees surrounding the lawn have been showing a healthy growth, and add materially to the general appearance. During the summer months waste oil has been spread over the parking lot area to allay the dust. During the winter months the roads in and about the mine surface plant including the parking lot area have been kept open for traffic after each snowfall with the tractor bull-dozer.

LLOYD MINE
ANNUAL REPORT
YEAR 1944

18. NATIONALITY OF
EMPLOYEES

	<u>American Born</u>	<u>Foreign Born</u>	<u>Total</u>	<u>Per Cent</u>
Finnish	64	27	91	41
French	39	-	39	17
English	18	4	22	10
Swedish	12	4	16	7
Italian	16	27	43	19
Norwegian	5	-	5	2
Austrian	2	1	3)	
Irish	2	-	2)	
German	1	-	1)	4
Belgian	1	-	1)	
Czecho-Slovak	1	-	1)	
Total	161	63	224	100

The ratio of foreign born to American born employees shows an increase as compared with the previous year due to the loss of a large number of young men into the armed service.

MATHER MINEANNUAL REPORTYEAR 19441. GENERAL:

During the fourth year of the program at the Mather Mine the emphasis was gradually shifted from main level drifting and crosscutting to sublevel exploration, development and mining. By the year's end, the 2nd Level drifting program was nearing completion, work on the 3rd Level had been stopped, the main drift on the 5th Level was approaching the east end of the shaft pillar, and the opening of the 6th Level plat had been started.

1944 was a year that was beset with disappointments and frustrations which included: The finding of large amounts of high sulphur ore on the 2nd and 3rd Levels, the abnormally wet conditions in the only standard ore area available for mining, and the extreme shortage of labor. By the end of the year, however, the outlook was much brighter with the prospect of obtaining additional men and the knowledge that a suitable mining area on the 5th Level would be available by the middle of 1945. Also, there was a fair chance of relieving the wet conditions above the 2nd Level before the end of the shipping season, by dewatering the old Cleveland-Hematite workings.

1944 was also the year that provided the needed experience with the surface plant and equipment which indicated the necessity for a number of changes and additions. The majority of the changes were in the headframe, engine house and top tram. The additions included: A new storage building and a large paving program, both of which were nearly completed by the end of the year. Other large additions are being planned--the extension of both of the permanent stocking trestles.

The excellent safety record, established since the opening of the property, was marred by a fatal accident in March and an unimportant "lost time" accident in September.

Effective the first of August the working schedule was reduced from five and one-third days per week to five; and the continued shortage of labor indicated the necessity of further reducing the operation from three shifts per day to two.

MATHER MINE
ANNUAL REPORT
YEAR 1944

2. PRODUCTION,
SHIPMENTS &
INVENTORIES:

a. Production by Grades:

	<u>1944</u>		<u>1943</u>
Mather	39,653	Tons	1,008
Mather Special	15,068	"	789
Total	54,721	"	1,797
Rock	72,717	"	81,240

b. Shipments:

<u>Grade of Ore</u>	<u>Pocket</u>	<u>Stockpile</u>	<u>Total</u>	<u>Total Tons</u>
	<u>Tons</u>	<u>Tons</u>	<u>Tons</u>	<u>Last Year</u>
Mather	4,827	28,577	33,404	1,008
Mather Special	1,919	5,517	7,436	789
Total	6,746	34,094	40,840	1,797

Pocket shipments of Mather Grade were limited to the small amounts of dry ore available underground. Practically all of that grade was stocked and then re-shipped from stockpile to permit drying before loading.

c. Stockpile Inventories:

	<u>1944</u>		<u>1943</u>
Mather	6,249	Tons	-
Mather Special	7,632	"	-
Total	13,881	"	-

Most of the Mather Grade was very wet and, as a result, the product obtained during the last few weeks of the season was not shipped. All of the Mather Special Grade which could be included in special cargoes was shipped, the balance being left in stock. Most of this grade was reasonably dry.

d. Division of Product by Levels:

	<u>Mather</u>		<u>Total</u>
	<u>Mather</u>	<u>Special</u>	<u>Tons</u>
Second (1600') Level	38,827	13,764	52,591
Third (1750') Level	64	1,304	1,368
Fifth (2050') Level	762	-	762
Total	39,653	15,068	54,721

Practically all of the Mather Grade ore on the 2nd Level was produced in actual mining operations. Most of the Mather Special was produced in main level crosscutting and exploration.

MATHER MINE
ANNUAL REPORT
YEAR 1944

2. PRODUCTION,
SHIPMENTS &
INVENTORIES:
(Continued)

e. Production by Months:

<u>Month</u>	<u>Mather</u>	<u>Mather Special</u>	<u>Total</u>	<u>Rock</u>
January	120	-	120	10,700
February	1,215	1,270	2,485	8,850
March	730	880	1,610	7,840
April	1,365	250	1,615	4,130
May	5,486	126	5,612	5,385
June	3,486	2,064	5,550	5,420
July	2,730	252	2,982	2,110
August	5,448	1,164	6,612	6,380
September	6,317	3,094	9,411	3,912
October	8,780	2,965	11,745 *	4,680
November	2,271	1,012	3,283	6,985
December	1,705	1,991	3,696	6,325
Total	39,653	15,068	54,721	72,717

f. Ore Statement:

	<u>Mather</u>	<u>Mather Special</u>	<u>Total</u>	<u>Total Last Year</u>
On Hand Jan. 1, 1944	-	-	-	-
Output for Year	39,653	15,068	54,721	1,797
Transferred	-	-	-	-
Total	39,653	15,068	54,721	1,797
Shipments	33,404	7,436	40,840	1,797
Balance on Hand	6,249	7,632	13,881	-
Increase in Output	38,645	14,279	52,924	1,797
Increase in Ore on Hand			13,881	-

1944 - 3-8 hr. shifts, 5-1/3 days per week, Jan. 1st to July 31st, 1944.
3-8 hr. shifts, 5 days per week, Aug. 1st to Dec. 31st, 1944.

1943 - 3-8 hr. shifts, 5-2/3 days per week, Jan. 1st to 31st, 1943.
3-8 hr. shifts, 5-1/3 days per week, Feb. 1st to Dec. 31st, 1943.

1942 - 3-8 hr. shifts, 5-2/3 days per week, Jan. 1st to Dec. 31st, 1942.

1941 - 1-8 hr. shift, 6 days per week, Jan. 1st to Jan. 12th, 1941.
2-8 hr. shifts, 5 days per week, Jan. 13th to Jan. 28th, 1941.
3-8 hr. shifts, 5-2/3 days per week, Jan. 29th to Dec. 31st, 1941.

g. Delays:

There were two delays during the year, both of which were premeditated:

Four operating shifts were lost on the 7th and 8th of April due to the necessity of cleaning the windings of the skip-hoist motor generator set. This work was done at the

MATHER MINE
ANNUAL REPORT
YEAR 1944

2. PRODUCTION,
SHIPMENTS &
INVENTORIES:
(Continued)

g. Delays (Continued):

request and under the supervision of the General Electric Company to prevent damage to the windings caused by the accumulation of oil from a leaking bearing. The responsibility for the leak was assumed by the General Electric Company and the work was done at their expense.

The property was idle from July 16th to the 30th inclusive to permit the installation of the permanent 6" x 10" cage runners, the new double-deck cage, the counterweight and counterweight rope. The property resumed normal operations on the morning of the 31st.

h. Delays from lack of Current:

None

3. ANALYSIS:

a. Average Mine Analysis on Output:

<u>Grade</u>	<u>Iron</u>	<u>Phos.</u>	<u>Silica</u>	<u>Sulphur</u>
Mather	60.32	.195	5.94	.033
Mather Special	59.60	.139	6.92	.160

b. Average Analysis on Straight Cargoes:

All of the shipments during 1944 were in mixed cargoes.

c. High Sulphur Ore:

The discovery of the presence of sulphur in the deposits on and above both the 2nd and 3rd Levels was the major disappointment in 1943. The grading of the product due to the sulphurous ores was one of the major operating problems in 1944.

Work on the 3rd Level was continued for several months during which time nothing but high sulphur ore was encountered. Inasmuch as the amount of sulphur was too great to permit mining even as a high sulphur grade, work on the level was discontinued in April.

The major portion of the crew was then concentrated on the 2nd Level where the results of exploration work were considerably more satisfactory. Fairly large reserves of both grades were partially explored and developed with the Special Grade predominating.

MATHER MINE
ANNUAL REPORT
YEAR 1944

3. ANALYSIS:
(Continued)

c. High Sulphur Ore (Continued):

The large area on and above #1 Crosscut on the 2nd Level was the only area of any size where the standard and sulphurous ores were fairly consistent. In this area the line of demarcation is sharp enough to permit the proper grading of the product. In all of the other areas where ore has been found to date the sulphur content is very inconsistent, changing from one grade to the other in a few feet. This made it difficult, and at times, impossible to properly separate the product by grades in spite of the large number of control samples taken. The average sulphur content of the Standard Grade was held to .033% for the year. The average of .160% sulphur in the Special Grade was the result of stopping operations on the 3rd Level and doing no mining on the 2nd Level where the sulphur exceeded .500%.

The ore encountered and produced on the 5th Level in the tail track drift south of the shaft was of very high grade with a sulphur content which averaged approximately .020%. As soon as a few mining places can be opened in similar material east of the shaft pillar, the problem of grading the mixture on the 2nd Level will be greatly reduced. There is no reason to expect any high sulphur reserves on or above the 5th and 6th Levels.

d. Complete Analysis of Ores in Stock:

	<u>Iron</u>	<u>Phos.</u>	<u>Silica</u>	<u>Mang.</u>	<u>Alum.</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sulph.</u>	<u>Loss</u>	<u>Moist.</u>
Mather	60.27	.191	6.02	.24	2.71	.92	.57	.031	2.84	13.72
Mather Special	59.39	.141	6.68	.24	2.81	1.86	.55	.156	2.31	12.64

4. ESTIMATE AND
ANALYSIS OF
ORE RESERVES:

Prior to this year, the only estimate of ore reserves at the property was the one made by the Geological Department in 1939. This estimate, which totaled some 7,000,000 tons, was made by means of cross-sections from the information obtained by surface drilling in the south half of the north-east quarter of Section 2. The limits since that time have been extended to the southeast by Holes 44 and 45, to the north by Holes 49 and 50, and to the west by the ore encountered in the shaft and on the 5th Level. In addition there are the reserves which have been partially explored and developed by the underground work on the 2nd and 3rd Levels.

A new estimate was prepared this year supplementing surface drill hole information by underground exploration. With the

MATHER MINE
ANNUAL REPORT
YEAR 1944

5. LABOR AND WAGES:

a. Comments

The average number of men on the payroll was gradually increased from 142 at the beginning of the year to a high of 162 in June. However, it was not possible to maintain this level of employment due to the drafting of all physically fit men under the age of 27. Losses to the Armed Forces totaled 11 during the year, and as a result, the number of men in December had declined to 148 in spite of all efforts to replace the loss. Absenteeism was comparatively low but contributed its part to reducing the average number of men on the labor statement, which was 141 in December. Additions to the payroll were 52, of which 17 were new employees and 35 were transferred from other mines, some temporarily; separations totaled 46, including the 11 inductees, leaving a net gain of six men for the year.

The contract with the CIO continued in force throughout the year, although the Union had re-opened negotiations for wage increases and a number of other concessions which were referred to the War Labor Board. In general, labor relations were excellent, due largely to the influence of the original crew which was wholly comprised of picked men. The year passed without any formal grievances being presented. A few minor individual complaints were settled as they arose, apparently to everyone's satisfaction.

The only change in the working schedule, which was a reduction from five and one-third to five days per week effective August 1st, had the effect of reducing the average "take home" pay. In spite of the reduction in the schedule, all of the employees worked a small amount of overtime each month during the cleanup and repair shifts on the weekends.

Payment of rate and one-half for work done in excess of eight hours per day or forty hours per week was continued as were the provisions for holidays and double time. Several variations in the interpretation of the President's Executive Order No. 9240 were in force at difference times.

The wage structure remained unchanged throughout the year at 78¢ per hour for common surface labor and 86 $\frac{1}{2}$ ¢ per hour

MATHER MINE
ANNUAL REPORT
YEAR 1944

5. LABOR AND WAGES:
(Continued)

a. Comments (Continued):

or \$6.92 per day for company account mining. The set contract price for main level drifting and crosscutting remained at \$11.00 per foot for untimbered rock drift and \$13.00 per foot for timbered rock drift. The set price for timbered ore drift varied from \$10.50 to \$12.00 per foot depending on conditions. The variation in the contract miners' earnings was greater, due to the larger number of crews and the larger variation in opportunity. The new high for a single contract pay period was \$15.04 per day with two other periods in excess of \$14.00, exclusive of overtime. The low of \$9.12 during 1943 compares with \$8.00 in 1944. Due to the larger number of men underground, the average earnings for that class of labor were reduced from \$9.81 to \$9.33, including overtime.

b. Comparative Statement of Wages:

	<u>1944</u>	<u>1943</u>	
<u>Number of Shifts & Hours:</u>	29	48	
	1 8-hr.	1 8-hr.	
	2	5	
	2 8-hr.	2 8-hr.	
	<u>245</u>	<u>255</u>	
	3 8-hr.	3 8-hr.	
Equiv. to	256	274-1/3	3 8-hr.
	3 8-hr.		
<u>Average No. of Men Working:</u>			
Surface	61	48-1/4	
Underground	91-1/4	59-1/2	
Total	<u>152-1/4</u>	<u>107-3/4</u>	
<u>Average Wages per Day:</u>			
Surface	7.12	7.28	
Underground	9.33	9.81	
Total	<u>8.28</u>	<u>8.50</u>	
<u>Wages per Mo. of 21-1/3 Days:</u>			
Surface	151.89	167.44	(23 days)
Underground	199.04	225.63	"
Total	<u>176.64</u>	<u>195.50</u>	"
<u>Total No. of Days:</u>			
Surface	22,472-3/4	17,574-1/2	
Underground	24,776-1/2	16,406	
Total	<u>47,249-1/4</u>	<u>33,980-1/2</u>	
<u>Amount for Labor:</u>			
Surface	160,160.36	128,098.26	
Underground	231,235.35	160,997.52	
Total	<u>391,395.71</u>	<u>289,095.78</u>	

MATHER MINE
ANNUAL REPORT
YEAR 1944

6. SURFACE:

a. Buildings:

The construction of the new storage building east of and parallel to the shop wing was started in October and continued through November and December. By the end of the year, approximately one month's work remained before the building would be ready for occupancy. This building is designed as a garage for the large tractor and Athey wagon and for storing the large amounts of supplies and equipment which cannot practically be kept in the mine warehouse. It is the only new building contemplated at the present time.

Few additions to the clothes racks and benches in the change rooms were necessary due to the stationary level of employment. Several minor changes in the buildings were found necessary and made during the year: A small office with an outside entrance was constructed for the surface, mechanical and electrical foremen. This change was made by utilizing a small portion of the northeast corner of the warehouse. In order to reduce the amount of necessary traveling from the shop wing through the engine house, a new entrance was constructed from the surface dry to the engine house basement. This makes it possible for workmen to enter the basement without going through the engine house proper, which is very desirable from the standpoint of maintaining order and cleanliness in the engine house. This work was started in December and practically completed by the end of the year.

b. Headframe:

Operations during the year provided enough experience to indicate certain necessary changes in the headframe. Most of these changes were mechanical in nature and were necessitated by the wet, sticky nature of the ore. The skip dumps, grizzlies and chutes were rearranged as found necessary, and by the end of the year were operating satisfactorily. Several other major changes are anticipated, including the rebuilding of both railroad pockets and the installation of electrically controlled and operated switches in the headframe and on the stocking trestles. The north side of the elevator shaft was enclosed to conform with state regulations and a fire protection system was installed at the top tram elevation. Considerable difficulty is still being experienced with ice in the elevator shaft from condensing underground moisture. It will undoubtedly be necessary to enclose the other two sides of the shaft and provide heaters to eliminate freezing.

c. Stockpiles and Stocking Trestles:

Stocking of the Standard Grade ore was done from the cantalver at the east end of the north trestle with the high sulphur product at the south end of the uncompleted extension to the south trestle. The experience with the extremely wet ore and the necessity for stocking two grades indicates the need for extensions to both trestles to provide approximately 300' of permanent trestle for each pile. Plans for these

MATHER MINE
ANNUAL REPORT
YEAR 1944

6. SURFACE:
(Continued)

c. Stockpiles and Stocking Trestles (Continued):

extensions have already been completed and proposals have been sent to three construction companies for estimates. It is planned to request the authorization for this construction early in 1945 to permit the placing of the concrete footings during the summer of that year and the construction of the trestles the following year.

d. Landscaping, Roads, and Parking Area:

A few minor additions and changes were made in the landscaping of the premises and were completed to the point where future work will consist largely of maintenance. The road entering the property was graded and paved late in the fall as were the major portion of the roads within the property and a portion of the parking area. In the area immediately in front of and adjacent to the office building, concrete curbing was installed and in the remainder, native stone curbing was used. As soon as possible in 1945 the grading and paving of the parking area will be completed as well as the roadway between the new storage building and shop wing, and the court between the main buildings. The property already presents an appearance unequalled by anything in the iron ranges.

e. Tracks:

Very little permanent track work was done by the L. S. & I. section crews due to the continuation of truck and tractor loading from the south railroad pocket. Also the property is not yet ready for the permanent installation of the stockpile and timber tunnel railroad tracks. A part of this work will be done in 1945 and the remainder the following year.

f. Timber Tunnels:

The extension of the upper or west timber tunnel was continued throughout the year as labor was available and completed to a point 410' beyond the point of curve. Construction was temporarily stopped at this point due to the necessity of removing a considerable quantity of solid rock which will require drilling and blasting. A small amount of this work was accomplished during the last half of July when the property was idle. The present completed portion of the west timber tunnel now provides sufficient storage area for present needs.

There was no extension to the east or lower timber tunnel from the point 60' northeast of the shaft which was concreted and stopped during 1942. The east portal, however, was started prior to the idle period in July when the cage runners were installed. The opening of the east portal required a large amount of excavating of overburden and considerable drilling and blasting before a solid heading was reached.

MATHER MINE
ANNUAL REPORT
YEAR 1944

6. SURFACE:
(Continued)

f. Timber Tunnels (Continued):

During the idle period a crew of men, who would otherwise have been idle, was utilized in driving a full size untimbered rock drift from the east portal toward the shaft. The advance was 62' of drift which will later be stripped to a full 14' width. The continuation of work on this project will now have to be postponed until more men are available or the need for additional timber storage makes it absolutely necessary.

g. Pipe Line:

No trouble was experienced with freezing in the 18" surface discharge line which connects the property with the culvert under North Second Street to the west. No attempt was made to cover this pipe since it involved a tremendous amount of work. The prediction of last year proved correct in that the large flow of relatively warm water from the new underground pump installation kept the ice from forming in the pipe. A small amount of maintenance work was necessary on the stands which support this pipe across the swamp.

7. UNDERGROUND:

a. Shaft Sinking:

None

b. Development:

The discussion which normally comes under this heading will be found in subsequent portions of the report under "7. e. Drifting and Raising", "7. i. Detail of Underground Operations" and "8."

c. Stoping:

All of the ore recovered from actual mining operations was produced above the 2nd Level, and by far the greater portion of this ore was mined in the territory above #1 Crosscut. Small quantities of both grades were recovered during the driving of full size timbered ore drifts which ultimately were used as transfer drifts. The remainder was obtained from sublevel stoping operations and sublevel caving. The amount of ore credited to stoping operations was 32,054 tons of Mather Grade and 4,376 tons of Mather Special, a total of 36,430 tons. The cost of producing this ore will be discussed under "8."

d. Timbering:

A total of 5,301' of full size rock drift was driven during the year, exclusive of the plats and shaft stations. Timbering was required in 1,451' of the total and it was later found necessary to strip and timber an additional 1,136' bringing the footage of timbered rock drift to 2,587' for the year or approximately one-half of the total. Main level drifting in

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

d. Timbering (Continued):

ore, all of which required timbering, totaled 1,106'. The average direct cost per foot chargeable to timbering was \$5.04, including the additional excavation required, placing of the timber by the drifting crews, and the framing on surface.

The following table records the amount and sizes of timber used on all operations during the year, the average cost - including handling and framing, and the total cost of the material for the year for all operations where timber was used.

Statement of Timber Used:

	LINEAL	AVG. PRICE	AMOUNT	
	FEET	PER FOOT	1944	
5'-4" Tamarack Cribbing	49,589'	.07049	3,495.75	
8" to 10" Stull Timber	8,297'	.11009	913.42	
10" to 12" " "	16,210'	.16513	2,676.80	
12" to 14" " "	3,997'	.22363	893.85	
Total	78,093'	.10218		7,979.82
		PER 100'		
7' Cedar Lagging	341,440'	1.6323	5,573.24	
18' Mining Timbers	270'	14.2777	38.55	
9½' Tamarack Poles	158,339'	2.8768	4,555.21	
Total	500,049'	2.0332		10,167.00
Grand Total	578,142'			\$18,146.82

The amount of timbering supplies used in the drifts and crosscuts on the three main levels and the amounts per foot of timbered drift are listed below.

Amount and Cost of Timber for 3693' of Timbered Drift:

	QUANTITY		AMOUNT PER FT.	LINEAL FT. PER
	LINEAL FT.	AMOUNT	TBRD. DRIFT	FOOT OF DRIFT
7' Lagging	242,737'	3,576.20	.9683	65.73'
9½' Tam. Poles	121,056'	3,342.93	.9052	32.78'
Stull Timber	21,606'	3,335.36	.9032	5.85'
18' Mining Timbers	270'	38.55	.0104	.07'
Total	385,669'	\$10,293.04	\$2.7871	104.43'

The cost of timber used in actual stoping operations was very small due to the method of mining used and the fact that the cost of developing the mining areas was charged to a separate account. The following table shows the timbering supplies used in actual stoping operations, exclusive of development in both rock and ore.

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

d. Timbering (Continued):

Amount of Timbering Supplies Used in Mining 36,430 Tons of Ore:

	QUANTITY LINEAL FT.	AMOUNT	AMOUNT PER TON	LINEAL FT. PER TON
7' Lagging	79,080'	1,612.44	.0443	2.17'
9½' Tam. Poles	27,169'	912.86	.0251	.75'
Stull Timber	5,961'	978.21	.0268	.16'
Total	112,210'	\$3,503.51	\$.0962	3.08'

Most of the remaining timber supplies were used in sublevel development work and charged to "Raising and Drifting between Levels" and the balance was used on the 5th Level plat as shown in the following tables:

Amount and Cost of Timber Used in Sublevel Development Work:

	LINEAL FEET	AVG. PRICE PER FOOT	AMOUNT
5'-4" Tamarack Gribbing	49,419'	.07457	3,481.93
10" to 12" Stull Timber	1,053'	.16900	177.96
Total	50,472'		3,659.89
		PER 100'	
7' Lagging	4,510'	2.04	92.00
9½' Tamarack Poles	1,662'	3.36	55.84
Total	6,172'		147.84
Grand Total	56,644'		\$3,807.73

Amount and Cost of Timber Used on the 5th Level Plat:

	LINEAL FEET	AVG. PRICE PER 100'	AMOUNT
7' Lagging	15,113'	1.936	292.60
9½' Tamarack Poles	8,452'	2.882	243.58
Total	23,565'		536.18
		PER FOOT	
8" to 10" Stull Timber	54'	.11778	6.36
Grand Total	23,619'		\$542.54

Most of the timbering on the 5th Level plat was temporary and was later replaced with steel sets.

e. Drifting and Raising:

The following table shows the total of all miscellaneous drifting and raising during the year, including: the main levels, the sublevels, a portion of the mining, and the work done in excavating the plats, pockets and trenches.

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

e. Drifting and Raising (Continued):

	<u>Drifting</u>		<u>Raising</u>		<u>Total</u>
	<u>Ore</u>	<u>Rock</u>	<u>Ore</u>	<u>Rock</u>	
Large Size	1,927'*	6,579'**	567'	332'	9,405'
Small Size	1,395'	1,350'	715'	448'	3,908'
Total	3,322'	7,929'	1,282'	780'	13,313'
Stripping and Timbering					1,524'
*1887' Timbered					
**1758' Timbered					
Grand Total					14,837'

The combined total of 14,837' compares with 8,632' in 1943.

Drifting and crosscutting in both ore and rock, timbered and untimbered, totaled 6,407' on the 960', 2nd, 3rd, and 5th Levels. In addition to this work, it was necessary to strip and timber 1,136' on the 2nd, 3rd, and 5th Levels.

Main Level Drifting and Crosscutting - All Levels:

Untimbered Rock Drifts	3,850'
Timbered Rock Drifts	1,451'
Timbered Ore Drifts	1,106'
Total	6,407'
Rock Drifts Stripped and Timbered	1,136'

The comparative cost of the above work will be discussed under "8."

The following table shows the amount of raising above the 2nd and 3rd Levels, and the amount of all sublevel development work which was charged to the account "Raising and Drifting between Levels". The figures do not include full size drifting in ore which was charged to "Actual Mining Operations".

Large Ore Raise Cribbed	567'
Large Rock Raise Cribbed	332'
Large Rock Drift Timbered	108'
Large Rock Drift Naked	154'
Small Ore Raise	715'
Small Rock Raise	448'
Small Ore Drift	1,395'
Small Rock Drift	1,211'
Total	4,930'

The comparative cost of this work will be discussed under "8."

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

f. Explosives, Drilling and Blasting:

With the exception of the rock immediately north of the plat on the 5th Level, the material encountered in drifting and raising was comparatively easy to break as evidenced by the amount which was timbered. Generally speaking, the ore was somewhat harder than the remainder of the Negaunee District and on the main levels was drilled with the wet drifters rather than with augers.

The following tables show the total amount of explosives used during the year; the explosives used in "Main Level Drifting and Crosscutting", "Raising and Drifting" and "Actual Mining Operations".

Statement of Explosives Used:

	<u>Quantity</u>	<u>Average Price</u>		<u>Amount 1944</u>	<u>Amount 1943</u>
Gelamite No. 1	58,744#	\$11.50	CWT	\$ 6,755.56	\$ 431.25
60% Gelatin Extra	78,258#	11.50	"	8,999.67	3,013.00
80% Gelatin Extra	29,970#	14.00	"	4,195.80	14,446.47
90% Gelatin Extra	-	-		-	99.00
Total Powder	<u>166,972#</u>	<u>\$11.948</u>	CWT	<u>\$19,951.03</u>	<u>\$17,989.72</u>
Electric Blasting Caps	36,156	\$12.396	C	\$ 4,481.89	\$ 5,009.80
No. 6 Blasting Caps	19,313	1.22	C	253.62	16.21
No. 14 Duplex Lead Wire	61,000'	18.00	M	1,098.00	591.00
No. 20 Connecting Wire	-	-		-	13.20
Tamping Paper Shells	18,800	6.00	M	112.80	78.00
Master Fuse Lighter Shells	1,000	20.64	M	20.64	-
#1 Powder Bags	12	1.40	Ea.	16.80	15.25
#2 Powder Bags	37	3.45	Ea.	127.65	41.40
Tamping Bags	5,000	2.15	M	10.75	-
7" Fuse Lighters	7,200	6.76	M	48.67	-
Primacord	370'	32.00	M	11.84	-
Blasting Fuse	162,168'	5.15	M	835.16	54.00
Total Caps, Wire, Fuse, Etc.				<u>7,017.82</u>	<u>5,818.86</u>
Grand Total Explosives & Blasting Supplies				\$26,968.85	\$23,808.58

Explosives Used in Driving 6,407' of Main Level Drifts and Crosscuts on the 960', 2nd, 3rd, and 5th Levels:

	<u>Quantity</u>	<u>Amount</u>	<u>Pounds of Powder Per Foot of Drift</u>	<u>Cost Per Foot</u>
Gelamite No. 1	17,482#	\$ 2,010.44		
60% Gelatin Extra	57,278#	6,586.98		
80% Gelatin Extra	25,007#	3,500.98		
Total Powder	<u>99,767#</u>	<u>\$12,098.40</u>	15.57	\$1.89
Misc. Blasting Supplies		3,811.18	-	.59
Grand Total		<u>\$15,909.58</u>	<u>15.57</u>	<u>\$2.48</u>

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

f. Explosives, Drilling and Blasting (Continued):

The average cost per foot of \$2.48 for explosives compares with \$3.17 in 1943, and includes the explosives used in stripping 1,136' of rock drift for timbering. This reduction is due to the greater percentage of ore drift. Generally speaking, the cost for explosives is approximately the same in timbered and untimbered rock drifts and averaged \$2.70 per foot; the cost in the timbered ore drifts was approximately \$1.50 per foot.

Explosives Used in Breaking 36,430 Tons of Ore Produced in Actual Mining Operations:

	Quantity	Average Price		Amount	Cost Per Ton
Gelamite No. 1	24,735#	\$11.50 CWT		\$ 2,844.52	\$.078
60% Gelatin Extra	445#	\$11.50 CWT		\$ 51.17	\$.0014
Total Powder	25,180#	\$11.50 CWT		\$ 2,895.69	\$.0794
Electric Blasting Caps	7,343	\$12.396 C		\$ 910.24	\$.0249
No. 6 Blasting Caps	5,180	1.22 C		63.20	.0017
No. 14 Duplex Lead Wire	7,500'	18.00 M		135.00	.0037
Tamping Paper Shells	1,100	6.00 M		6.60	.0002
Master Fuse Lighter Shells	500	20.64 M		10.32	.0003
#1 Powder Bags	3	1.40 Ea.		4.20	.0002
#2 Powder Bags	6	3.45 Ea.		20.70	.0006
Tamping Bags	5,000	2.15 M		10.75	.0003
7" Fuse Lighters	4,250	6.76 M		28.73	.0008
Blasting Fuse	57,840'	5.15 M		297.88	.0082
Total Caps, Wire, Fuse, Etc.				\$ 1,487.62	\$.0408
Grand Total Explosives & Blasting Supplies ...				\$ 4,383.31	\$.1203

Product (Actual Mining)	36,430 Tons
Pounds of Powder Per Ton of Ore69
Cost Per Ton for Powder	\$.0794
Cost Per Ton for Blasting Supplies	\$.0408
Cost Per Ton for All Explosives	\$.1203

The average cost per ton for explosives and the amount of explosives per ton of ore mined was considerably greater than the average for the district. This is due entirely to the fact that most of the ore encountered was quite hard and required more explosives for proper breaking. This increased cost is more than offset by the fact that open sublevel stopes were possible with greater efficiency than in top-slicing.

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

g. Loading and Trimming:

As the result of the experience gained during 1943 and the early months of 1944, the original Conway Model 125 loading machines were almost completely redesigned and rebuilt, most of the expense being born by the manufacturer, The Goodman Manufacturing Company of Chicago. All of the mechanical changes which were made were the result of numerous break-downs resulting in excessive lost time. The delivery of the third machine, which had been ordered at the same time as the other two, was postponed until all of the mechanical changes had been perfected. It was then built according to the new design. As a result of these numerous changes, all three machines were working very satisfactorily throughout the latter months of the year.

During the period when the two original Conways were the cause of a large amount of lost time, negotiations were entered into with the Eimco-Finley Corporation for the trial purchase of a Model 40 air driven loader. The manufacture and delivery of this machine was also postponed while the Eimco engineers studied the problems peculiar to this operation. The machine was delivered late in September and was used intermittently throughout the balance of the year. A number of minor mechanical defects were observed and corrected and by December the machine was operating satisfactorily, although it has not yet been accepted.

In comparing these two loaders, the main difference observed to date is the more powerful action of the air driven machine, which is an advantage under certain conditions. Both makes are extremely efficient in loading the different types of rock encountered, but there is still some difficulty when either of them is working in soft sticky ore. This is a condition that has been noted whenever conveyor belts have been used in this district.

The work of changing all of the underground cars to the Granby Type was completed early in the year and a camel back dumper was installed on the 2nd Level for use with both the Lake Shore and Pressed Steel cars. The use of the Card cars, which were originally purchased as Granby Type, was continued on the 3rd Level and the 5th Level as soon as it was opened.

The experience gained in using these three makes of cars over a period of approximately a year and one-half furnished enough data for the design of a fourth car which is now standard with the Lake Shore Engineering Company and is known as the "Lohed" car. This car is now available as either a cylinder dump or Granby Type in capacities ranging from 75 to 100 cubic feet. By the end of the year it had

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

g. Loading and Trammig (Continued):

been definitely determined that this car is far superior to the old Lake Shore cars, the Pressed Steels and the Cards, since most of the design was the result of experience at this property. It has the simplicity and lightness of the Card cars and is lower and more stable than the Pressed Steel cars. The special door locking device makes the car water-tight which is an absolute necessity when loading ore under wet conditions. The Card car will not hold wet ore at all.

As a result of these experiences, it has been definitely decided to standardize on the Lake Shore car for all future purchases and to increase the capacity of both old and new cars to 100 cubic feet instead of 90. This is a fairly simple task with the cars which have already been purchased and the new ones will be ordered accordingly. This change to 100 cubic feet was found necessary to more closely balance the capacity of the cars with the skips, since it is planned to use a direct dumping method on the new 6th Level. The present 90 cubic feet capacity does not quite fill the skip when two cars are dumped direct.

Trammig was continued using the four General Electric battery locomotives and two new ones which were purchased during the year. The new locomotives are of an improved design to take care of wet underground conditions where keeping the tracks clean is almost impossible.

Three new 8-ton trolley locomotives of a special design were purchased from the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pennsylvania, for use on main line haulage. It was originally intended to electrify the 2nd and 3rd Levels, but it has now been decided to use this equipment on the new 5th and 6th Levels.

The handling of ore and rock at the shaft was continued using the trenches on the 2nd and 3rd Levels and a similar design on the 5th, except that two trenches were excavated instead of one. The trench system is very satisfactory except for the fact that it is somewhat difficult to avoid contamination when high and low sulphur ores and rock are being handled in the same trench. This condition was partially overcome by means of specially built scrapers which practically fit the bottom of the trenches. The use of two trenches on the 5th Level will not only increase the hoisting capacity of the level but will also improve the conditions which tend to contaminate the ore.

The original design on the 6th Level has been changed from trenches to pockets, each of which will hold two cars, or

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

g. Loading and Traming (Continued):

one skip. With storage capacity in the trenches on the other levels and an extra train of cars on the 6th Level, it is felt that this arrangement will be very satisfactory. The experience during the year indicated the necessity for larger scrapers, hoists and motors in these trenches; and new equipment was ordered accordingly.

h. Ventilation:

In general, the ventilation system was continued along the lines of the original plan, with the cage compartment of the shaft downcast and the two skip compartments upcast. Since the installation of the new, big cage, considerable difficulty has been experienced with freezing in the downcast cage compartment. In extremely cold weather, the water lines from surface froze solid and were discontinued. The small amount of water in the compartment formed ice and required frequent chopping to permit the passage of the cage. Freezing also made the ladder compartment impassable during certain periods, due to the accumulation of ice on the ladder rungs and sollars. This condition indicates the probable necessity of purchasing equipment to pre-heat the air going into the mine. An alternate method of handling the situation is the frequent reversing of the direction of the air currents, which is practical under some conditions. However, this arrangement is not usually satisfactory and freezing conditions in the skip compartments would be more serious due to the larger amount of water in the east side of the shaft.

The natural air current caused by the height of the headframe became insufficient early in the year, due to the increased mine resistance in the newly driven openings. A second ventilation connection was put up from the 3rd to the 2nd Level connecting the #7 Crosscuts at a point approximately 3,000' from the shaft. It was then found necessary to install a medium size auxilary fan on the 3rd Level to increase the natural volume. This fan is an American Blower, Size 5½, Class One, rated at approximately 35,000 C.F.M. The actual volumes varied from a low of 30,000 C.F.M. in the summer months to a high of approximately 40,000 during the cold weather in December.

The use of the Sturtevant, Size 45, Planovane Fans was continued in all of the rock headings, exhausting an average of 5,000 C.F.M. through the 16" metal ventilation pipe. Due to the opening of the two new levels, additional units of this size were ordered but not delivered by the end of the year. The use of the Lamb Air Movers in the place of the auxilary fans in the headings was continued with complete satisfaction. There were no dangerously high dust counts noted at any time

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

h. Ventilation (Continued):

during the year, in spite of the large number of rock headings and numerous examinations.

The ventilation of the exploration and mining headings above the two levels was usually accomplished by means of direct connections with the main air currents. When this was impractical, the headings were ventilated either by means of auxiliary fans or Lamb Air Movers.

i. Detail of Underground Operations:

960' Level:

A study of the conditions which were responsible for the large amount of water encountered in the working places on and above the 2nd Level indicated the necessity for dewatering the old Cleveland-Hematite workings north of the property. The bottom of these workings is 1,000' from surface at a sea-level elevation of approximately +510', as compared with a depth of 1600' on the 2nd Level and a sea-level elevation of -140' at the plat. Numerous tests and readings on surface indicated a very rapid fall of the water-level in the shafts and pits in the vicinity of the old mine and in several other pits a considerable distance from it. An attempt was made to reopen the old shaft with the thought of pumping out the workings directly from surface. This project was found impractical and was abandoned in August. At the beginning of this same month work was begun on the 960' Level which is approximately 7' lower than the bottom of the Cleveland-Hematite workings. A small opening was made north of the cage compartment and drifts were driven on both sides of the plat pillar. A small temporary pocket was constructed for use with the north skip, after which a drift was driven to the northeast and stopped at a point approximately 300' from the shaft and the same distance from the old drift. The heading was stopped at this point due to the increasing amount of water which was flowing from the breast. After stopping the heading, the excavation for a high pressure dam was made at a point 125' from the shaft. A smaller cut-out for the two centrifugal pumps was completed in December. Meanwhile, two Ingersoll-Rand motor pumps with capacities of 500 G.P.M. were ordered as were miscellaneous high pressure valves, gauges and fittings. A steel door, designed to hold a pressure in excess of 500 pounds per square inch, was designed and built in the company's general shops. A Pumpcrete Machine, Model 160, Single, was ordered from the Chain Belt Company, Milwaukee, Wisconsin, for use in placing the concrete for the dam and for other miscellaneous concrete jobs which are anticipated. At the end of the year this level was idle pending the delivery of equipment.

Originally it was hoped that the work on this level could be completed and pumping started early in the year, but the

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

i. Detail of Underground Operations (Continued):
960' Level (Continued):

delayed deliveries on the equipment have made this impossible. However, it is hoped that pumping from the old workings can be started early enough in 1945 to better conditions in the wet mining areas before the end of the shipping season.

Subs Above the 2nd Level:

Exploration and development in the area above #1 Crosscut were started early in the year immediately after the completion of the crosscut through the main dike. In general, it was found that the ore between the true footwall and the interbedded slates was very narrow and confined to a comparatively small area both vertically and horizontally. Also, a few feet above the main level the ore was very high in sulphur. In contrast to this deposit, the area south or above the interbedded slates was found to be quite extensive both laterally and vertically. Also, except for a few isolated areas, the sulphur content was low enough for the production of standard grade ore, although the phosphorus was rather high on some of the upper sublevels. Generally speaking, the deposit is wedge shaped with its point occurring between the jasper and the south dike in the vicinity of #2 Crosscut. It widens very rapidly to the west and is capped by very hard jasper which is pitching upwards to the northwest.

Exploration, development and mining of these two deposits were carried out on the -25' to the -110' Sublevels inclusive. In most cases it was necessary to drive two transfer drifts in order to follow the ore up along its very flat dip. In the deposit beneath the interbedded slates, two transfer drifts were driven, one on the -110' and the other on the -85' Sublevel. Exploration work above this latter sublevel disclosed the presence of a jasper capping a few feet above in the west half, after which a small amount of high sulphur ore was recovered by top-slicing. A pair of exploration raises in the east portion disclosed ore on and above the -60' Sublevel. The mining of the east portion of this deposit was deferred due to the necessity of maintaining two connecting drifts to #8 Stope to the east. These drifts will be used for stoping purposes and the mining of the deposit will be deferred until mining above the interbedded slates is completed.

A considerable amount of full size timbered drifting was done in the main deposit on the -50', -85', -100', and -110' Sublevels. Most of these drifts were used as transfers for small sublevel stopes which were opened up under the jasper capping. In the one stope east of the main crosscut, jasper was encountered immediately above the -75' Sublevel with the ore rising somewhat higher to the north and northwest. The

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

i. Detail of Underground Operations (Continued):
Subs Above the 2nd Level (Continued):

two stopes on the west side of the crosscut encountered jasper above the -25' Sublevel with the ore rising to greater heights to the north and west.

Generally speaking, mining operations were not particularly satisfactory in this area in spite of the fact that a large tonnage was produced. The amount of water flowing into the stopes and drifts from the jasper capping is so great that neither mining nor tramming operations can be carried on efficiently. The deposit is almost perfect for sublevel stoping operations, since the ore is firm enough to stand well and the jasper capping is very hard and shows no tendency to cave. However, it was necessary to stop virtually all of the work in this territory as soon as freezing weather set in, since it was almost impossible to handle the wet ore on surface. Approximately three-fourths of all of the water from the property or 180 G.P.M. was flowing out of the four active working places in this area.

The second deposit which was discovered and explored occurs in the area above the 3rd and 4th Crosscuts. This ore was originally discovered by diamond drilling from an exploration drift south of Raise #2010 on the -60' Sublevel, which is approximately 75' above the main level. Additional exploration in this deposit was also done on the +15' Sublevel or approximately 150' above the level. Although the information to date is incomplete, it has been determined that this deposit occurs in three different structures: one between the true foot and interbedded slates, the second between the interbedded slates and a large dike, and the third, south of the large dike beneath the jasper capping. The grade of the deposit is very spotty, varying from extremely high class standard ore to low grade material which is very high in sulphur. As nearly as can be determined with present information, this deposit is pitching upward to the northwest and downward to the east, and probably will be intercepted on the level by #5 Crosscut. This area is also extremely wet which made it necessary to stop exploration and development work early in November. If sufficient men are available, it is planned to resume operations in this territory early next spring.

The third deposit that is known to exist on and above the 2nd Level was originally outlined by D.D.H.#11 and #12 which were drilled along the proposed locations of the 6th and 7th Crosscuts. The only sublevel work which was done in this deposit was above the east drift which was turned off in the ore from #7 Crosscut. Three raises were put up and small size

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

i. Detail of Underground Operations (Continued):
Subs Above 2nd Level (Continued):

exploration drifts were driven northwest of two of them on the -75' Sublevel approximately 50' above the level. At the present time, the knowledge regarding this deposit is very meager, but enough is known to predict that it is a continuation of the same deposit which was encountered on the -60' Sublevel above #3 and #4 Crosscuts, that it is pitching downward from that area, that the jasper capping reaches a low point in the neighborhood of #7 Crosscut and that from there it pitches sharply upward to the northeast. The deposit occurs above the interbedded slates and is lying in a trough formed by the slate and a large east - west dike which is standing almost vertically. The information obtained on the 3rd Level indicates that this deposit is cut off by the dike a comparatively short distance below the 2nd Level.

2nd Level:

Main level drifting along the strike to the northeast was not very extensive during the year having been practically completed in 1943. The main footwall drift was continued a distance of 420' where it was stopped beyond the curve for #7 Crosscut.

Crosscutting on this level was very extensive and included work in the 1st, 2nd, 3rd, 4th, 6th, and 7th Crosscuts, all of which were completed by the end of the year, at which time #5 Crosscut had been started and was well beyond the point of tangency. Operations in #1 Crosscut were begun with the stripping of the small size ventilation drift after which the crosscut was continued to the south through slate, both grades of ore, and jasper. The deposit immediately south of the slate foot was approximately 60' wide along the crosscut, 40' of which was standard ore and 20' high sulphur. Beyond the interbedded slates was a run of approximately 140' of high grade standard ore, north of the large main dike. The crosscut was driven through the dike and a short distance beyond into the jasper where a ventilation connection was later made. Six double-compartment cribbed raises were put up from this crosscut: two from the east side and four from the west side. The extent of the ore above the level varied from a few feet close to the dike to well over 150' just south of the interbedded slates.

Information obtained in #1 Crosscut was so encouraging that #2, #3, and #4 were driven without any further exploration work. All three of these crosscuts were driven through the main dike and into the jasper beyond without encountering any ore of commercial importance. Immediately north of the dike in #2 Crosscut, a small wedge of high sulphur ore was

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

i. Detail of Underground Operations (Continued):

2nd Level (Continued):

encountered which is apparently the east portion of the deposit outlined by #1 Crosscut. Crosscut #3 encountered no ore at all and #4 a short run of high sulphur ore against the dike, which is probably the west end of the deposit which widens to the east.

The single exploration raise which was put up from the west side of #2 Crosscut was stopped a few feet above the level in very lean jasper. Later a powder magazine was excavated on the same side of the crosscut and at the end of the year plans were being made for additional excavation to accommodate the battery charging equipment. There is still a good possibility that future exploration work will discover mineable reserves above this crosscut.

The first exploration above #3 and #4 Crosscuts was done by means of Raise #2010, which was put up from the south side of the main drift. After the discovery of ore on the -60' elevation, double-compartment cribbed raises were put up from the east side of #3 and the west side of #4 Crosscuts. Both of these raises encountered high sulphur ore a short distance above the level and were used for a continuation of the development work. By the end of the year, plans were being made for at least one new raise above each of these crosscuts.

Crosscut #7 was driven along the line of D.D.H.#12 and encountered a run of ore approximately 135' in length, most of which was high sulphur grade. The drift which was turned off to the east was driven 250' in ore of both grades, after which footwall jasper was encountered against the Jackson Lease line. Three double-compartment cribbed raises were put up from the north side of this turnoff: the first, #2731, encountered jasper approximately 40' above the level; the second, #2735, encountered jasper 50' above the level; and the third, #2737, was up to a height of 97' in ore at the end of the year. Most of the ore encountered in these three raises was too high in sulphur to be mined and mixed for a standard grade product. The material in #2737 was very slabby and treacherous, and it will probably be necessary to stop it temporarily while a safer means of continuing it is devised.

A second ventilation raise was put up from the 3rd Level and holed to the west side of #7 Crosscut just south of the main drift. This raise furnished the air for ventilating the whole east end of the level.

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

i. Detail of Underground Operations (Continued):
2nd Level (Continued):

Crosscut #6 was started in November and by the end of December had been completed through the dike and into the jasper beyond. The run of ore encountered in this crosscut was much shorter than in #7 and amounted to only 50' of high sulphur grade. The connecting drift was turned off to the east in the ore and by the end of the year had been advanced just beyond the point of tangency. It is planned to complete this connection through to #7 Crosscut and utilize the drift for both tramming and ventilation purposes.

Subs Above 3rd Level:

The small amount of sublevel work above the 3rd Level was confined to the early months of the year and to two small areas, one above #1 Crosscut and the other above #7 Crosscut. The work above #1 Crosscut was on the -185' Sublevel and consisted of a small amount of exploration drifting south of the ventilation raise connecting the 1st Crosscuts on the 3rd and 2nd Levels. The original small exploration drift was driven almost due south of the ventilation raise and almost directly beneath #1 Crosscut on the 2nd Level. Its original purpose was to determine the extent of the deposit below the level and also to determine the amount of sulphur in the ore. This small untimbered drift was driven a distance of 310' south of the raise through the main dike and into the jasper beyond without encountering anything but ferruginous slate mixed with occasional bands of lean high sulphur ore. This was very surprising in view of the large amount of ore found in #1 Crosscut approximately 50' above this sublevel. A small amount of crosscutting was then done to the east and west from a point approximately 215' south of the ventilation raise. The drift to the west encountered nothing but slate and lean ore, and the drift to the east entered high sulphur ore approximately 15' from the original drift and continued in that material an additional 100' where the main dike was encountered.

The information obtained by this work was very disappointing both as to the amount of reserves below the level and to the grade of the ore which is very high in sulphur. Without any doubt, the standard ore reserves do not continue to any appreciable depth below the level and the whole deposit is cut off by the intersection of the footwall and the main dike a short distance below the Sublevel.

A small uncribbed ventilation raise was then put up from the south end of the drift beyond the dike and holed to the south end of #1 Crosscut on the 2nd Level above. This connection has proved of great value in providing ventilation for the crosscut and all of the working places above it.

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

i. Detail of Underground Operations (Continued):
Subs Above 3rd Level (Continued):

The rest of the sublevel work above the 3rd Level was done on the -250' Sublevel approximately 20' above the south end of #7 Crosscut where a fairly long run of high sulphur ore was encountered on the main level. The work was done to the northwest, northeast, and south of Raise #3712 and consisted of small, untimbered drifts in jasper and lean high sulphur ore, proving beyond any doubt that the high sulphur deposit on the level does not rise to any height above it. This work was completed in April, after which no further attempt was made to explore or develop above the 3rd Level.

3rd Level:

The driving of the main level footwall drift to the northeast was completed early in January at a point 535' west of the Jackson Lease line and 100' beyond the turnout for #7 Crosscut which was turned off to the southeast the same month. Drifting in the crosscut was continued through February to a point 800' from the main level drift where it was stopped in jasper a few feet beyond a large dike. Approximately 100' of high sulphur ore was encountered immediately north of the same dike and averaged approximately .400% sulphur, which is too high for the Mather Special Grade.

Raise #3712 was then put up to the southwest a distance of approximately 20' where very hard, lean jasper was encountered. The small amount of exploration work from the top of this raise completed the attempt to develop mineable reserves above the level.

Raise #3701 was then put up to the northeast from a point 60' from the main level drift and holed to #7 Crosscut on the 2nd Level, completing all work on and above the 3rd Level for the current year with the exception of some diamond drilling which will be discussed in a latter portion of this report.

After the completion of the diamond drilling, a low concrete dam was installed across the main level drift a few hundred feet north of the shaft just beyond the fan station. This permits the storing of large quantities of water which greatly improves the pumping cycle.

5th Level:

The work of opening this new level on the 2050' elevation was carried out at a much slower rate than originally planned, due to the extreme shortage of manpower and the need of utilizing most of the available men on development and exploration work above the 2nd Level. As a result, the

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

i. Detail of Underground Operations (Continued):
5th Level (Continued):

work which had been planned for the first six months of the year required a full year for completion. The rock encountered in the immediate vicinity of the shaft and for approximately 100' to the north was very blocky and hard to handle and required support on both the cage and skip sides of the plat. The material to the north for the next 400' was quite satisfactory and required no support. The main footwall drift was turned off to the east at a point 420' north of the shaft where poor drifting material was soon encountered. Timbering was started at a point 400' east of the north drift and was being continued at the end of the year.

The main drift to the north was continued 120' beyond the turnout in excellent material and was later enlarged to provide room for the installation of the Westinghouse Ignitron Set which will convert the underground AC current into DC for the operation of the main line trolley locomotives on this level and the 6th Level below.

There were several important differences in the preparation of this level in comparison with the 2nd and 3rd Levels. Anticipating the need for support, structural steel was purchased and used instead of timber; 8" I-beams in 16 and 18' lengths were used as caps and supported by 4" H-beams - 9' long. This arrangement worked out very well and will prove much more economical since the timber on the 2nd and 3rd Levels will undoubtedly have to be replaced after a few years. At a later date, it is planned to concrete this plat leaving the structural steel in place as reenforcing. The pumpcrete machine which was ordered primarily for the main dam on the 960' Level will prove invaluable for this work. The other main difference between this plat and the other two is the construction of two trenches instead of one. This will double the hoisting capacity of the level and will practically eliminate the contamination experienced in the single trench.

The wide portion of the plat was continued 100' to the south beyond which a normal size tail-track drift was driven an additional 105'. The south 60' of this drift was in the known ore deposit between the footwall and the interbedded slates. This ore was very high in quality, averaging approximately: Iron 62.60, Phosphorus 0.168, Sulphur 0.021. As yet no attempt has been made to determine whether or not ore occurs in the horizon above the interbedded slates. This will be done from #1 Crosscut which will enter the ore approximately 1,000' east of the shaft. It is hoped that the above analyses are typical of the ore to be found on and above this level and that several mining places can be opened during 1945. The production

MATHER MINE
ANNUAL REPORT
YEAR 1944

7. UNDERGROUND:
(Continued)

i. Detail of Underground Operations (Continued):

5th Level (Continued):

of a fairly large quantity of this low sulphur material would greatly aid the problem of grading the product from the 2nd Level.

At the present rate of progress, #1 Crosscut should enter the ore late in March or early in April.

6th Level:

The original plan for opening this level, which is 2200' below surface, was postponed due to the labor shortage. Instead of being nearly completed by the end of the year, it was hardly started. The first work was done in July and then stopped almost immediately due to the necessity of transferring the men to the 960' Level. The work was then continued in the last half of December, by the end of which, drifting north of the cage compartment had reached a point 66' from the shaft. Unless a larger crew is available, it will not be possible to assign a sufficient number of men to the project to obtain normal speed, in spite of the importance of this new level.

7th Level:

There was no new work done during the year on this level, which is 2350' below surface and at the bottom of the shaft.

8. COST OF OPENING,
EQUIPPING, &
DEVELOPING:

The following summary of all of the Mather Mine E&A's shows the total amounts authorized, the total expenditures to date, ore credits allocated to the different accounts, the unexpended balances as of the end of the year and the amounts spent during the current year. The form of the summary has been changed since last year in that it shows separately the amounts chargeable to capital expenditure and the amounts taken into the Negaunee Mine Company's operations. Following the summary is a discussion of several of the individual accounts.

8. COST OF OPENING, EQUIPPING, AND DEVELOPING:

	E&A REFERENCE	TOTAL AUTHORIZED	TOTAL EXPENDITURES TO DEC. 31, 1944				1944 EXPENDITURES		
			GROSS EXPENDITURES	CREDITS A/C ORE MINED IN DEVELOPMENT	NET EXPENDITURES	UNEXPENDED BALANCE	BEFORE ORE CREDITS	1944 ORE CREDITS	AFTER ORE CREDITS
1. BUILDINGS AND EQUIPMENT:									
a-Main Building	(10-10&19)	280,000.00	279,768.02	-	279,768.02	231.98	-	-	-
b-Change House and Shop Equipment	10-26 (10-4)	60,000.00	41,110.45	-	41,110.45	18,889.55	8,557.68	-	8,557.68
c-Initial Shop Equipment	(10-4A 10-9)	5,732.73	5,732.73	-	5,732.73	-	-	-	-
d-One 35 Ton Overhead Crane ...	(10-9A)	8,894.94	8,894.94	-	8,894.94	-	-	-	-
e-Temporary Equipment	10-18	15,000.00	14,079.62	-	14,079.62	920.38	629.80	-	629.80
f-Erecting & Equipping Storage Building	31 (10-23)	20,900.00	15,102.28	-	15,102.28	5,797.72	15,102.28	-	15,102.28
g-Compressor Plant	(10-23A)	73,000.00	71,626.13	-	71,626.13	1,373.87	6,090.88	-	6,090.88
TOTAL		463,527.67	436,314.17	-	436,314.17	27,213.50	30,380.64	-	30,380.64
2. SURFACE:									
a-Equipment:									
1-Temporary Surface Plant ..	10-3	31,130.00	26,506.28	-	26,506.28	4,623.72	-	-	-
2-Truck and Tractor	10-1	18,575.00	18,289.42	-	18,289.42	285.58	-	-	-
3-Electric Shovel	18	85,000.00	81,996.18	-	81,996.18	3,003.82	81,996.18	-	81,996.18
4-Top Tram Equipment	(10-24 10-24A)	46,000.00	43,183.13	-	43,183.13	2,816.87	4,408.80	-	4,408.80
5-Timber Tunnel, Tracks Pumphouse & Sump	(10-20 10-20A)	58,000.00	57,867.78	-	57,867.78	132.22	2,362.48	-	2,362.48
6-Timber Tunnel & Yards	29	74,800.00	8,374.77	-	8,374.77	66,425.23	8,374.77	-	8,374.77
7-Mechanical Additions	32	27,500.00	4,818.39	-	4,818.39	22,681.61	4,818.39	-	4,818.39
TOTAL		341,005.00	241,035.95	-	241,035.95	99,969.05	101,960.62	-	101,960.62
b-General:									
1-Diamond Drilling	9 (Sec. 2)	80,000.00	77,938.69	-	77,938.69	2,061.31	9,361.87	-	9,361.87
2-Moving Two Houses	10-2	3,458.00	3,458.00	-	3,458.00	-	-	-	-
3-Drainage Well	10-11	1,896.00	1,896.00	-	1,896.00	-	-	-	-
4-Road Building, Paving Parking Lot, Etc.	25	23,760.00	7,079.01	-	7,079.01	16,680.99	7,079.01	-	7,079.01
TOTAL		109,114.00	90,371.70	-	90,371.70	18,742.30	16,440.88	-	16,440.88
3. SHAFT, HEADFRAME AND TRESTLE:									
a-Sinking in Sand	(10-15 10-15A 10-16)	16,302.44	16,302.44	-	16,302.44	-	-	-	-
b-Sinking in Rock	(10-16A 10-5)	440,000.00	435,294.50	2,559.15	432,735.35	7,264.65	5,853.78	-	5,853.78
c-Shaft Sets	(10-5A)	160,975.45	150,624.25	-	150,624.25	10,351.20	-	-	-
d-Headframe Foundation & Ore Trestle	(10-21 10-21A 10-7)	78,000.00	77,417.73	-	77,417.73	582.27	51.63	-	51.63
e-Headframe & Trestle	(10-7A)	186,028.83	186,028.83	-	186,028.83	-	-	-	-
f-Headframe & Power House Equipment	(10-22 10-22A)	225,000.00	224,831.13	-	224,831.13	168.87	8,613.05	-	8,613.05
g-Electric Equipment for Cage & Skip Hoists	10-8	221,783.00	221,783.00	-	221,783.00	-	-	-	-
h-One Ore Hoist & One Skip Hoist	10-6 (10-12)	143,000.00	143,000.00	-	143,000.00	-	-	-	-
i-Elevator for Headframe	(10-12A)	4,853.00	4,853.00	-	4,853.00	-	-	-	-
TOTAL		1,475,942.72	1,460,134.88	2,559.15	1,457,575.73	18,366.99	14,518.46	-	14,518.46

Continued,

8. COST OF OPENING, EQUIPPING, AND DEVELOPING:
(Continued)

	E&A REFERENCE	TOTAL AUTHORIZED	TOTAL EXPENDITURES TO DEC. 31, 1944				1944 EXPENDITURES		
			GROSS EXPENDITURES	CREDITS A/C ORE MINED IN DEVELOPMENT	NET EXPENDITURES	UNEXPENDED BALANCE	BEFORE ORE CREDITS	1944 ORE CREDITS	AFTER ORE CREDITS
4. UNDERGROUND:									
a-Plant:									
1-Pumping Plant	(10-25 10-25A)	55,000.00	52,731.20	-	52,731.20	2,268.80	2,128.24	-	2,128.24
b-Equipment:									
1-Mining Equipment	19	44,550.00	38,540.69	-	38,540.69	6,009.31	5,744.88	-	5,744.88
2-Mining Equipment	28	51,700.00	11,069.08	-	11,069.08	40,630.92	11,069.08	-	11,069.08
3-Haulage Equipment	(10-29 10-29A)	110,000.00	96,430.18	-	96,430.18	13,569.82	21,463.74	-	21,463.74
4-Haulage Equipment	23	90,420.00	42,455.99	-	42,455.99	47,964.01	42,455.99	-	42,455.99
TOTAL		296,670.00	188,495.94	-	188,495.94	108,174.06	80,733.69	-	80,733.69
c-Development:									
1-Plats & Pockets	(10-28 10-28A)	88,000.00	87,708.70	-	87,708.70	291.30	204.66	-	204.66
2- Drifting to Ore Body: 1st Six Months - 1600' & 1750' Levels	10-27	240,000.00	242,003.14	2,003.14	240,000.00	-	2,987.15	-	2,987.15
3-Underground Explorations ..	21	25,000.00	19,852.80	-	19,852.80	5,147.20	12,233.84	-	12,233.84
4-Underground Development: 1600-1750' Levels (2nd Six Months)	24	280,500.00	404,648.57	126,411.50	278,237.07	2,262.93	379,574.34	126,411.50	253,162.84
1600' Level - Continuation of Main Level Drifting & Crosscutting (2nd Level) .	33	49,500.00	-	-	-	49,500.00	-	-	-
1600' Level - Development & Exploration, Raising & Drifting Above 1600' Level	34	50,000.00	-	-	-	50,000.00	-	-	-
2050' Level	26	275,000.00	99,664.96	1,911.86	97,753.10	177,246.90	94,725.53	1,911.86	92,813.67
2200' Level	27	144,100.00	17,264.29	-	17,264.29	126,835.71	14,933.29	-	14,933.29
TOTAL		1,152,100.00	871,142.46	130,326.50	740,815.96	411,284.04	504,249.49	128,323.36	375,926.13
d-Dewatering Hematite Workings .	30	66,000.00	16,349.50	-	16,349.50	49,650.50	16,349.50	-	16,349.50
TOTAL BEFORE CONTINGENCIES		3,959,359.39	3,356,575.80	132,885.65	3,223,690.15	735,669.24	766,761.52	128,323.36	638,438.16
Plus 10% for Contingencies		228,217.26	-	-	-	228,217.26	-	-	-
TOTAL TO CAPITAL ACCOUNT INCLUDING CONTINGENCIES		4,187,576.65	3,356,575.80	132,885.65	3,223,690.15	963,886.50	766,761.52	128,323.36	638,438.16
General Expense	10-13	-	271,716.98	-	271,716.98	-	94,581.51	-	94,581.51
Maintenance	10-14	-	37,050.73	-	37,050.73	-	13,726.25	-	13,726.25
Building Roads & Landscaping .	10-17	-	9,455.40	-	9,455.40	-	2,362.72	-	2,362.72
TOTAL to Negaunee Mine Company-Idle Expense.....		-	318,223.11	-	318,223.11	-	110,670.48	-	110,670.48
GRAND TOTAL		4,187,576.65	3,674,798.91	132,885.65	3,541,913.26	963,886.50	877,432.00	128,323.36	749,108.64

MATHER MINE
ANNUAL REPORT
YEAR 1944

8. COST OF OPENING,
EQUIPPING, &
DEVELOPING:
(Continued)

1. BUILDINGS AND EQUIPMENT:

f. Erecting & Equipping Storage Building - E&A NM-31:

The expenditure of \$15,102.28 in this account during the year is the contract price of \$14,910.00 plus a few miscellaneous charges. The unexpended balance of \$5,797.72 is estimated for heating, lighting, and storage racks. This work will be done by the mine crew in 1945.

g. Compressor Plant - E&A NM-10-23:

The charge of \$6,090.88 in this account covered the cost of the 12" air line in the shaft.

2. SURFACE:

a. Equipment:

3. Electric Shovel - E&A NM-18:

The 4-Yard, Model 120-B, Bucyrus-Erie Ward Leonard, Electric, Caterpillar Shovel was delivered to the Negaunee Mine early in the year. This machine will be used at that property until the amount of ore to be loaded at the Mather Mine exceeds that at the Negaunee Mine, at which time the shovel will be returned. Its operation during the year was very satisfactory and much more efficient than the old steam railway shovel.

4. Top Tram Equipment - E&A NM-10-24:

The charge of \$4,408.80 covered the company's portion of the changes made in the three larry cars. A much larger charge was absorbed by the Lake Shore Engineering Company.

5. Pumphouse & Sump - E&A NM-10-20:

The expenditure of \$2,362.48 during the year completed the work in the pumphouse and sump on the 3rd Level.

6. Timber Tunnel & Yards - E&A NM-29:

The expenditure of \$8,374.77 was made in extending the west timber tunnel and starting the work at the east end of the east timber tunnel. The unexpended balance of \$66,425.23 is estimated to complete both tunnels and yards.

7. Mechanical Additions - E&A NM-32:

This account was authorized to take care of miscellaneous mechanical additions and changes which were found necessary in the headframe. The expenditure of \$4,818.39 during the year was made in changing the chutes, pockets, and grizzlies above the top tram. The balance, which exceeds \$22,000.00, is estimated to complete the changes to the top tram and railroad pockets and provide some miscellaneous new equipment.

MATHER MINE
ANNUAL REPORT
YEAR 1944

8. COST OF OPENING,
EQUIPPING, &
DEVELOPING:
(Continued)

2. SURFACE (Continued):

b. General:

1. Diamond Drilling - E&A NM-9 (Sec. 2):

A division between Sections 1 and 2 was made in this account during the year. The expenditure of \$9,361.87 for the drilling of Hole #53 completed the present surface drilling program in Section 2.

4. Road Building, Paving Parking Lot, Etc. - E&A NM-25:

This account was authorized for the building of several roads into and within the property, a large amount of paving including the parking area, and the construction of concrete curbing. The concrete curbing, which was confined to the immediate vicinity of the office building, was completed but the remainder of the work was delayed by poor weather.

Below is a detailed statement of the expenditures in this account during the year:

1944 EXPENDITURES

Road Building & Grading	\$2,034.90
Paving	4,406.20
Concrete Curbing	595.31
Social Security Taxes	<u>42.60</u>
Total	\$7,079.01

3. SHAFT, HEADFRAME AND TRESTLE:

b. Sinking in Rock - E&A NM-10-16:

The expense of installing the permanent cage and cage runners was charged to this account in the amount of \$5,853.78.

f. Headframe & Power House Equipment - E&A NM-10-22:

1944 EXPENDITURES

Mechanical Devices in Headframe	\$3,870.84
Main Switchboards & Power Cables	2,282.02
Bell Lines & Signals.....	1,610.36
Counterweight	<u>849.83</u>
Total	\$8,613.05

MATHER MINE
ANNUAL REPORT
YEAR 1944

8. COST OF OPENING,
EQUIPPING, &
DEVELOPING:
(Continued)

4. UNDERGROUND:

a. Plant:

1. Pumping Plant - E&A NM-10-25:

The expenditure of \$2,128.24 in this account completed the erection and installation of the two main pumps on the 3rd Level.

b. Equipment:

1. & 2. Mining Equipment - E&A NM-19 & 28:

The original authorization in NM-19 was estimated to cover the cost of equipping the first ten mining contracts. In anticipation of a large force of men and increased mining activity, the second estimate, NM-28, was made covering the cost of equipping an additional ten contracts. Due to the fact that men were not available, the yearly expenditure in these two accounts was not large. However, the purchase of large amounts of mining equipment is planned for 1945.

3. Haulage Equipment - E&A NM-10-29:

The original authorization for haulage equipment, E&A NM-10-29, was increased by a supplement in the amount of \$20,000.00 to cover the purchase of two additional battery locomotives, a spare truck to fit both the new and old locomotives, two spare batteries, and two battery chargers. The amount expended during the year, \$21,463.74, purchased all of the above equipment except the battery chargers which were on order. The unexpended balance, \$13,569.82, will be ample to complete this account and cover the excavation for the battery charging stations as well as the purchase of additional equipment.

4. Haulage Equipment - E&A NM-23:

The second authorization for haulage equipment, NM-23, was made to cover the purchase of three 8-ton trolley locomotives, a 200 KW converter, underground cars and timber trucks as well as the expense of installing trolley wire in 8,000' of main level drift. It was originally planned to use this equipment on the 2nd and 3rd Levels. Later the plan was changed to utilize this equipment on the 5th and 6th Levels.

As shown in the itemized statement below, the more important pieces of equipment were received in 1944. The new underground cars and the rest of the timber trucks were on order at the end of the year.

MATHER MINE
ANNUAL REPORT
YEAR 1944

8. COST OF OPENING,
EQUIPPING, &
DEVELOPING:
(Continued)

4. UNDERGROUND (Continued):

b. Equipment (Continued):

4. Haulage Equipment - E&A NM-23 (Continued):

1944 EXPENDITURES

1 - 200 KW Ignitron Converter	\$14,350.00
3 - 8-Ton Trolley Locomotives	23,428.48
Changes to Present Cars	1,756.76
Underground Timber Trucks	2,853.26
Miscellaneous	33.40
Social Security Taxes	34.09

Total \$42,455.99

c. Development:

2. Drifting to Ore Body: 1600' & 1750' Levels - E&A NM-10-27:

The small charge of \$2,987.15 in this account was made in January, after which the work on these two levels was charged to E&A NM-24.

3. Underground Explorations - E&A NM-21:

Diamond drilling under this E&A was continued throughout the first half of the year in Holes #7 to #12 inclusive; the total footage was 2,411' as compared with 1,624' the previous year. The detail of these expenditures for the year is shown below:

	AMOUNT <u>AUTHORIZED</u>	1944 <u>EXPENDITURES</u>	COST <u>PER FT.</u>	
<u>Equipment:</u>	-	32.38	.013	.013
<u>Drilling Costs:</u>				
Labor	-	4,553.42	1.888	
Miscellaneous Supplies	-	4,696.23	1.948	
Diamond Drill Carbon	-	1,132.47	.470	
Diamond Drill Rental	-	237.50	.098	
TOTAL	-	10,619.62	4.404	
<u>Overhead Expense:</u>				
Analysis	-	1,233.54	.512	
Geological	-	232.94	.097	
Soc. Security Taxes	-	115.36	.048	
TOTAL	-	1,581.84	.657	5.061
GRAND TOTAL	\$25,000.00	\$12,233.84		\$5.074
UNEXPENDED BALANCE		\$ 5,147.20		

MATHER MINE
ANNUAL REPORT
YEAR 1944

8. COST OF OPENING,
EQUIPPING, &
DEVELOPING:
(Continued)

4. UNDERGROUND (Continued):

c. Development (Continued):

3. Underground Explorations - E&A NM-21 (Continued):

As was mentioned in the report for last year, the 1943 charges did not include approximately \$1,000.00 worth of bits which were used during the year. Deducting this amount from the operating charges above has the effect of reducing the average operating cost per foot from \$5.06 to \$4.66 as compared with \$3.04 for the previous year. This increased cost is due to the greater depth of the holes and the larger sizes. Early in 1945 it will be necessary to obtain an additional appropriation for the continuation of this work.

4. Underground Development: Continuation of Main Level Development 1600' & 1750' Levels - E&A NM-24:

1944 EXPENDITURES

Equipment	\$ 4,724.17
Drifting on 1600' Level	150,549.60
Timbering the 1600' Level	17,345.61
Drifting on 1750' Level	49,050.52
Timbering the 1750' Level	1,272.19
Raising & Drifting between Levels	151,106.04
Social Security Taxes	4,836.94
Analysis	689.27
GROSS TOTAL	<u>\$379,574.34</u>
ORE CREDITS	<u>126,411.50</u>
NET TOTAL	\$253,162.84

All of the work above both main levels was charged to the item "Raising and Drifting between Levels". This included sublevel development work in both ore and rock and the actual recovery of ore. The discussion of combined main level drifting costs will be found later in this report. Below is a detail of the sublevel work charged to NM-24:

1944 EXPENDITURES

Actual Mining	\$ 95,748.90 (1)
Raising & Drifting (Ore & Rock)	<u>55,357.14 (2)</u>
TOTAL RAISING AND DRIFTING	
BETWEEN LEVELS	\$151,106.04

MATHER MINE
ANNUAL REPORT
YEAR 1944

8. COST OF OPENING,
EQUIPPING &
DEVELOPING:
(Continued)

4. UNDERGROUND (Continued):

c. Development (Continued):

4. Underground Development: Continuation of Main Level
Development 1600' & 1750' Levels - E&A NM-24 (Continued):

All E&A charges include a proportion, based on underground cars, of the general mine expense exclusive of E&A's NM-10-13 and NM-10-14. In the following tables the direct charges and cost per foot are shown separately from the so called "overhead" or pro-rated charges.

Cost of Mining 36,430 Tons of Ore:

<u>Direct</u>	<u>Per Ton</u>	<u>Overhead</u>	<u>Per Ton</u>	<u>Total</u>	<u>Per Ton</u>
\$67,280.53	\$1.85	\$28,468.37	\$0.78	\$95,748.90	\$2.63

The above costs include all charges to actual mining operations exclusive of development work in both ore and rock. The expenditure is offset by an estimated ore credit of \$85,345.74, f.o.b. mine value exclusive of overrun. The amount of overhead charged to this account was 25.4% of the total for the year.

The balance of the charges to "Raising and Drifting between Levels" is item (2) above, totaling \$55,357.14 for miscellaneous raising and drifting in both ore and rock, which totaled 4,930' as detailed in Chapter "7. e.". The comparative cost of this work is shown below:

	<u>Direct</u>	<u>Overhead</u>	<u>Timbering</u> <u>Supplies</u> <u>& Labor</u>	<u>Total</u>
	<u>Per Foot</u>	<u>Per Foot</u>	<u>Per Foot</u>	<u>Per Foot</u>
Small Ore Raise ... 715'				
Small Ore Drift ... 1,395'				
Total	\$ 4.43	\$ 1.05	-	\$ 5.48
Small Rock Raise .. 448'				
Small Rock Drift .. 1,211'				
Total	\$ 7.45	\$ 1.75	-	\$ 9.20
Large Ore Raise				
Cribbed	\$11.78	\$ 2.79	\$ 3.88	\$18.45
Large Rock Raise				
Cribbed	\$15.10	\$ 3.57	\$ 3.88	\$22.55
Large Rock Drift				
Timbered	\$32.57	\$10.16	\$ 5.04	\$47.77
Large Rock Drift				
Naked	\$26.60	\$ 8.48	-	\$35.08
Grand Total 4,930'				
Total Expenditure	<u>Actual</u> \$45,048.48	<u>Overhead</u> \$10,308.66		<u>Total</u> \$55,357.14

MATHER MINE
ANNUAL REPORT
YEAR 1944

8. COST OF OPENING,
EQUIPPING, &
DEVELOPING:
(Continued)

4. UNDERGROUND (Continued):

c. Development (Continued):

4. Underground Development: Continuation of Main Level Development 1600' & 1750' Levels - E&A NM-24 (Continued):
Offsetting the above expenditure is a credit for ore obtained from development work totaling 5,579 tons or \$13,070.11. The amount of overhead charged to this account was 10% of the total for the year.

4. Underground Development: 2050' Level - E&A NM-26:

1944 EXPENDITURES

Plats, Pockets, & Mechanical Devices.	\$53,785.46
Drifting on 2050' Level	39,707.90
Social Security Taxes	1,232.17
GROSS TOTAL	\$94,725.53
ORE CREDIT	1,911.86
NET TOTAL	\$92,813.67

4. Underground Development: 2200' Level - E&A NM-27:

1944 EXPENDITURES

Equipment	\$ 159.67
Plats, Pockets, & Mechanical Devices .	14,717.36
Social Security Taxes	56.26
TOTAL	\$14,933.29

d. Dewatering Hematite Workings - E&A NM-30:

Below is a detail of the operations and the charges for the year which were made to the above E&A, which was authorized for the purpose of dewatering the old Cleveland-Hematite workings:

1944 EXPENDITURES

Plat & Pocket	\$ 3,628.74
Drifting	8,311.21
Concrete Dams	2,936.45
2 - 500 G.P.M. Pumps, Etc.	916.29
Diamond Drilling	2.79
Examination of Old Shafts & Pits	363.16
Social Security Taxes	190.86
TOTAL	\$16,349.50

MATHER MINE
ANNUAL REPORT
YEAR 1944

8. COST OF OPENING,
EQUIPPING, &
DEVELOPING:
(Continued)

4. UNDERGROUND (Continued):

Combined Main Level Drifting and Crosscutting:

The cost of main level drifting and crosscutting on all levels under E&A's NM-10-27, NM-24, NM-26, NM-27 and NM-30 has been combined for the purpose of obtaining the average cost per foot. As shown in the table under Chapter "7. e.", main level drifting and crosscutting totaled 6,407' divided as follows:

Untimbered Rock Drift	3,850'
Timbered Rock Drift	1,451'
Timbered Ore Drift	<u>1,106'</u>
Total	6,407'

In addition, it was necessary to strip and timber 1,136' of rock drift. The comparative cost per foot of the above work is shown below:

	<u>Actual</u>	<u>Timbering</u>	<u>Total</u>	<u>Overhead</u>	<u>Grand</u>
	<u>Per Foot</u>	<u>& Labor</u>	<u>Per Foot</u>	<u>Per Foot</u>	<u>Total</u>
	<u>Per Foot</u>	<u>Per Foot</u>	<u>Per Foot</u>	<u>Per Foot</u>	<u>Per Foot</u>
Untimbered Rock					
Drift - 3,850'	\$25.67	-	\$25.67	\$8.48	\$34.15
Timbered Rock					
Drift - 1,451'	\$31.64	\$5.04	\$36.68	\$10.16	\$46.84
Timbered Ore					
Drift - 1,106'	\$30.07	\$5.04	\$35.11	\$10.16	\$45.27
Stripping &					
Timbering - 1,136' ..	\$8.19	\$5.04	\$13.23	\$1.50	\$14.73

The total expenditure for the above work was \$250,078.49 of which \$189,603.11 was actual direct charges with overhead at \$60,475.38, which was 53.7% of the total for the year. The ore credit applicable to the drifting in ore was \$27,995.65 for 11,950 tons of ore.

MATHER MINE
ANNUAL REPORT
YEAR 1944

8. COST OF OPENING,
EQUIPPING, &
DEVELOPING:
(Continued)

GENERAL EXPENSE - E&A NM-10-13:

Below is a detailed statement of the yearly expenditures under E&A NM-10-13, which were charged to the operations of the Negaunee Mine Company:

1944 EXPENDITURES

Insurance	\$ 4,778.68
Engineering - Mining, Mechanical, & Electrical	8,593.46
Geological	1,014.84
Analysis	5,986.03
Mine Office	15,749.98
Central Office, Etc.	17,618.09
Superintendence	11,638.15
Legal	205.41
Personal Injury Expense	12,054.36
Social Security Taxes	1,474.12
Retirement Annuity Premiums	1,414.95
Policing	7,844.89
Employees' Vacation Pay	6,132.47
Adjustment of Supplies Inventory	<u>76.08</u>
TOTAL	\$94,581.51

MAINTENANCE - E&A NM-10-14:

The charges to this account during the year will be found under heading 14. - "Maintenance and Repairs".

MATHER MINE
ANNUAL REPORT
YEAR 1944

9. EXPLORATIONS
AND
FUTURE
EXPLORATIONS:

Drilling in Section 2 was confined to a single hole, #53, which was put down near the north line a short distance east of the 1/4 corner. This hole was started late in May and completed on the 1st of September at a depth of 1,491'. No ore was encountered. The record of this drilling as well as the drilling in Section 1 to the east and Section 3 to the west will be found in the report of the Geological Department.

The accounting of the drilling in Sections 1 and 2 was separated as discussed in Chapter "8.". No additional surface drilling is planned in Section 2, at least in the near future, but the program in Section 1 will be continued throughout 1945.

The underground drilling program was continued during the early months of the year and stopped in June, due to the necessity of using the drill men on other work. Six holes were drilled, #7 to #12 inclusive. Five of these holes were drilled on or above the 2nd Level in determining the proper location of the crosscuts and sublevel development work. Hole #10, which was drilled from the southeast end of #7 Crosscut on the 3rd Level, was planned to test for a continuation of the ore which was found by surface Hole #39 at approximately the 2nd Level elevation. This hole encountered ore at a depth of 707' and was continued in that material a distance of 61' where it was stopped, due to the large volume of water encountered. The sulphur content of the ore was extremely high, far above any sulphurous grade which is merchantable at the present time.

It is hoped that men will be available to continue the underground drilling in 1945.

The following table is a record of all of the underground drilling during the year:

MATHER MINE EXPLORATION
YEAR 1944

NO.	LOCATION	DIRECTION	DIP	DATE		MATERIAL	FINISHED DEPTH	
				STARTED	FINISHED			
7	#1 Crosscut, 2nd Level	S8°E	0°	1/4/44	1/8/44	0-50'	Slate	142'
						50-85'	Standard Ore (with sulphur just within the limit)	
						85-102'	High Sulphur Ore (with very high iron content)	
						102-132'	Mixed Lean High Sulphur Ore & Slate	
						132-142'	Jasper with Seams of Slate	
8	#2 Crosscut, 2nd Level	S8°20'E	0°	3/6/44	3/23/44	0-127'	Soft Ore Jasper	127'
9	Raise #2010, -60' Sublevel	S5°18'E	0°	3/31/44	4/12/44	0-40'	Transition Slate & Jasper	221'
						40-77'	Dike	
						77-100'	High Sulphur Ore	
						100-118'	Dike	
						118-150'	High Sulphur Ore	
						150-208'	Standard Ore	
						208-221'	Jasper	
10	#7 Crosscut, 3rd Level	S40°E	0°	3/31/44	4/21/44	0-104'	Soft Ore Jasper	768'
						104-113'	Dike	
						113-198'	Soft Ore Jasper	
						198-707'	Soft Ore Jasper	
						707-768'	High Sulphur Ore	
		Continued		6/3/44	6/26/44			
11	#6 Crosscut, 2nd Level	S35°18'E	0°	4/19/44	6/7/44	0-15'	Siamo Slate	599'
						15-56'	Soft Ore Jasper	
						56-90'	Interbedded Slate	
						90-98'	Transition Slate & Jasper	
						98-153'	Slate & Jasper	
						153-222'	Soft Ore Jasper	
						222-234'	High Sulphur Ore	
						234-246'	First Class Ore	
						246-345'	Lean Ore & Jasper	
						345-354'	Dike	
354-599'	Soft Ore Jasper							

(Continued)

MATHER MINE EXPLORATION
YEAR 1944

<u>NO.</u>	<u>LOCATION</u>	<u>DIRECTION</u>	<u>DIP</u>	<u>DATE</u>		<u>MATERIAL</u>	<u>FINISHED DEPTH</u>
				<u>STARTED</u>	<u>FINISHED</u>		
12	#7 Crosscut, 2nd Level	S42°21'E	0°	4/25/44	5/29/44	0-102' Slate 102-196' Transition Slate & Jasper 196-243' Jasper & Lean Ore 243-270' High Sulphur Ore 270-280' Standard Ore 280-295' Lean Ore 295-305' Standard Ore 305-323' Lean Ore, Jasper 323-358' High Sulphur Ore 358-373' Lean Ore, Jasper 373-385' Dike 385-554' Soft Ore Jasper	554'

MATHER MINE
ANNUAL REPORT
YEAR 1944

10. TAXES:

Once again the real property valuation was arbitrarily increased on a basis of additional capital investment, since there was no appreciable change in the estimate of ore reserves. The increase was \$295,000.00, from \$1,400,000.00 to \$1,695,000.00. In addition, the personal property valuation was increased from \$100,000.00 to \$105,000.00.

The total taxes paid in the City of Ishpeming by the Negaunee Mine Company are shown below, including the pipe line parcel in Section 3:

<u>MATHER MINE</u> Section 2, 47-27, except the N 600' of NE of NE and the Rights of way	<u>1944</u>		<u>1943</u>	
	<u>VALUATION</u>	<u>TAXES</u>	<u>VALUATION</u>	<u>TAXES</u>
Real	\$1,695,000.00	\$61,001.86	\$1,400,000.00	\$47,589.64
Personal	105,000.00	3,778.88	100,000.00	3,399.26
Total	<u>\$1,800,000.00</u>	<u>\$64,780.74</u>	<u>\$1,500,000.00</u>	<u>\$50,988.90</u>
Coll. Fee				509.89
Total	<u>\$1,800,000.00</u>	<u>\$64,780.74</u>	<u>\$1,500,000.00</u>	<u>\$51,498.79</u>
 Mather Mine Pipe Line, parcel in Section 3, 47-27	 600.00	 21.59	 600.00	 20.60
Grand Total ..	<u>\$1,800,600.00</u>	<u>\$64,802.33</u>	<u>\$1,500,600.00</u>	<u>\$51,519.39</u>

11. ACCIDENTS
AND
PERSONAL
INJURY:

Two "lost time" accidents occurred during 1944, one of which was a fatality. On March 9th Gust Maki, an experienced contract miner, was caught by a fall of ground during the stripping and timbering of the main footwall drift on the 2nd Level. This most regrettable accident was investigated by a committee of superintendents and judged an unpreventable "trade risk".

The second "lost time" accident was a minor affair which occurred on September 18th, when William Abbott, a young, inexperienced underground laborer, had his left leg squeezed between two underground locomotives. He suffered severe contusions without a fracture.

The lost time occasioned by the two accidents had the effect of sharply increasing the severity rate, due to the comparatively small number of man days worked. The frequency rate was 5.29 per million man hours, and the severity rate was 16.08 days per thousand man hours as compared with an average of 15.61 and 3.24 for all the operations of the company, including the open pits and the Cliffs Power and Light Company. The total number of man hours worked was 377,994 and the lost time 6,080 days, including 6,000 days for the fatality.

MATHER MINE
ANNUAL REPORT
YEAR 1944

12. NEW CONSTRUCTION
AND PROPOSED
NEW CONSTRUCTION:

New construction work during the year has been discussed under previous headings. The only proposed new construction at the present time, other than those projects already authorized, is the erection of permanent extensions to both stocking trestles, plans for which were being made at the end of the year. The experience obtained during 1944 made it apparent that the present system is inadequate for the handling of wet ore and the separation of two or more grades. Accordingly, it is planned to request an authorization for the completion of the present trestle to the south and east and permanent extensions to both trestles approximately 300' in length. Although final figures are not now available, this project will cost in the neighborhood of \$110,000.00. This figure was included in the forecast for the next two years and presented to the Negaunee Mine Company's Board of Directors at a recent meeting. As soon as formal bids are obtained, this authorization will be requested.

13. EQUIPMENT AND
PROPOSED EQUIPMENT:

The experience and conclusions with the underground loaders, locomotives, and cars have already been discussed as well as the new equipment which was purchased during the year.

Considerable study was given to the operation of the underground scraper-hoists which seemed under-powered as compared with the DC machines with which the whole mine crew is familiar. It was finally determined that the AC motors in use at the property were considerably under-powered as compared with the comparable size in the DC operation. Accordingly, arrangements were made with both the Ingersoll-Rand and the Sullivan Machinery Companies to take back most of the motors and replace them with others of the same H.P. rating. These motors, however, have a much higher pull-out-torque factor and will be similar in operation to the DC motors which have proved so satisfactory at the other mines of the company. The new motors will have a pull-out-torque factor of 5 as compared with 2.5 to 2.8 on the machines at present. The expense involved in this change is not great since the motors now in use have a considerable exchange value.

The changes and additions to the top tram cars which were mentioned in last year's report were successfully completed early in the year, after which the cars operated with entire satisfaction. Inasmuch as most of these changes were necessitated by faulty design, the bulk of the expense was born by the Lake Shore Engineering Company. Several changes to the original design were specifically requested and paid for in the amount of \$4,408.80.

MATHER MINE
ANNUAL REPORT
YEAR 1944

13. EQUIPMENT AND
PROPOSED EQUIPMENT:
(Continued)

The small Whitcomb battery locomotive, which was originally purchased for the timber tunnel, was used considerably throughout the year both on surface and underground. The small size of this locomotive makes it very valuable, since it can be put directly on the cage and sent where it is needed. It will probably be advisable to purchase at least one and possibly two more of these machines in the near future.

14. MAINTENANCE
AND REPAIRS:

The maintenance and repair account was originally an authorized E&A, but is now an account which is charged directly into the operating expense of the Negaunee Mine Company. As is shown in the table below, the total for the year is somewhat smaller than for 1943:

	<u>1944</u>	<u>1943</u>
Truck & Tractor	\$ 1,468.65	\$ 5,566.23
Buildings	2,351.08	484.34
Shop Machinery	-	25.33
Boilers, Heating	2,062.69	132.79
Hoisting Machinery	5,389.96	4,750.30
Compressors & Air Lines	152.98	2,119.90
Pumps	<u>2,300.89</u>	<u>2,093.01</u>
TOTAL	\$13,726.25	\$15,171.90

All other maintenance and repair charges were either charged directly to the E&A where the equipment was being used or were pro-rated into the E&A's under the expense items which were called "Overhead" in the discussion of the cost of operating.

15. POWER:

The consumption of electric power increased approximately 40% over 1943, from 2,785,000 kilowatt-hours to 3,893,000. Due to the steady running of the main pumps on the 3rd Level and a large increase in the amount of electrical equipment, the average maximum demand was increased from 600 to 965 K.W. The increased volume of consumption, however, had the effect of holding the average demand factor to 46% as compared with 48% in 1943 and the average cost per kilowatt-hour to .0144 as compared with .0142.

MATHER MINE
ANNUAL REPORT
YEAR 1944

15. POWER:
(CONTINUED)

The following table shows the consumption and rates and a comparison with the two previous years:

	<u>CONSUMPTION</u> <u>K.W. HOURS</u>	<u>AVERAGE</u> <u>MAX. DEMAND</u>	<u>AVERAGE</u> <u>DEMAND FACTOR</u>	<u>COST</u> <u>OF CURRENT</u>	<u>AVERAGE PRICE</u> <u>PER K.W. HOUR</u>
1944 -	3,893,000	965 K.W.	46%	\$56,121.80	\$0.0144
1943 -	2,785,000	600 K.W.	48%	39,725.80	.0142
1942 -	1,510,830	325 K.W.	47%	23,448.14	.0155

Throughout the greater portion of the year, it was possible to operate both skip and cage hoists from the large skip hoist motor generator set. Occasionally, it was necessary to run both machines for a short time. In anticipation of the time when these change-overs will become more frequent, new electrical equipment was ordered for the purpose of making them much more rapidly. This equipment, which consists of a number of panels and terminals, will be installed in 1945.

16. WATER SUPPLY:

The consumption of water furnished by the City of Ishpeming was considerably greater than the previous year, due to the larger number of men using the shower rooms. Very little City water was used underground, since water is available under pressure from several of the diamond drill holes. Furthermore, it is impossible to maintain a water line in the shaft during freezing weather. In addition to the figures in the following table, a flat charge of \$14.00 was paid for the use of several lawn sprinklers which were not metered.

	<u>CONSUMPTION</u>	<u>COST</u>	<u>COST PER</u> <u>THOUSAND GAL.</u>
1944 -	5,205,200	\$481.82	\$.092
1943 -	4,868,000	446.64	.092
1942 -	2,487,000	231.36	.093

18. NATIONALITY OF EMPLOYEES:

	<u>American</u> <u>Born</u>	<u>Per</u> <u>Cent</u>	<u>Foreign</u> <u>Born</u>	<u>Per</u> <u>Cent</u>	<u>Total</u>	<u>Per</u> <u>Cent</u>
American ..	22	15.3%	-	-	22	15.3%
English ...	10	6.9	4	2.8%	14	9.7
Finnish ...	44	30.6	9	6.2	53	36.8
Canadian ..	7	4.9	-	-	7	4.9
Swedish ...	15	10.4	2	1.4	17	11.8
Norwegian .	10	6.9	-	-	10	6.9
German	2	1.4	-	-	2	1.4
Irish	2	1.4	-	-	2	1.4
Danish	1	.7	-	-	1	.7
Italian ...	9	6.2	1	.7	10	6.9
French	4	2.8	-	-	4	2.8
Manx	1	.7	-	-	1	.7
Dutch	1	.7	-	-	1	.7
Total ..	128	88.9%	16	11.1%	144	100.0%

MORRIS MINE
ANNUAL REPORT
YEAR 1944

1. GENERAL

Mine production declined from the 1943 high of 437,853 tons to 308,953 tons. The three reasons entering into this decrease were: a reduction in the working schedule from six to five days during the first half of the year, a lower proportion of ore from sub-level stoping operations, and mainly the continued loss of manpower which reduced the working force from 220 at the beginning to 178 men at the end of the year.

In contrast to the above, development drifting on the 9th Level disclosed additional ore to the extent of increasing the reserve 1,062,337 tons over that reported to the Tax Commission last year. This tonnage combined with production indicates a total increase of 1,371,290 tons, of which 1,024,600 was on Cliffs fee lands south of the Morris shaft. The east development drift was still in ore at the end of the year with the end of this large deposit as yet undisclosed.

There were no special alterations or improvements to the surface plant. Pumping continued from the surface wells and caves with the effect of again reducing the quantity of underground water. A new well, No. 10, on surface, was brought in during September and at the end of the year was pumping 1,100 GPM to raise the average surface rate to over 3,000 GPM. The underground average in 1944 amounted to 895.2 GPM.

The proportion of the product hoisted from fee lands was but little changed from last year. Development on the 9th Level indicated, however, that for the next several years this proportion should show an increase.

2. PRODUCTION,
SHIPMENTS &
INVENTORIES

a. Production

<u>Grade</u>	<u>Tons</u>	<u>Percent of Total</u>
Morris Standard	226,951 ✓	73.5
Morris Silicious	82,002	26.5
Total	308,953	100.0
Total last year	437,853	

The 1944 production came from fee and leased lands in the following proportions;

MORRIS MINE
ANNUAL REPORT
YEAR 1944

2. PRODUCTION
SHIPMENTS &
INVENTORIES (Cont.)

	<u>Fee</u>	<u>Leased</u>	<u>Total</u> <u>Tons</u>
Morris Standard	50,489	176,462	226,951
Morris Silicious	13,983	68,019	82,002
Total	64,472	244,481	308,953
Percent of total	20.9%	79.1%	

The percentage figures compare with 20.0% and 80.0% respectively last year. The maximum proportion of ore from the fee lands to date was 48.1% in 1936, and the minimum 11.4% in 1941. A summary of the total production since the Inland Steel Company acquired the Morris Mine Lease, starting with 1933, or over a twelve year period, is listed below:

	<u>Tons</u>	<u>Percent</u>
Lease Ore Product 1933-1944	2,750,798	74.7%
Fee Ore Product 1933-1944	931,046	25.3
Total	3,681,844	100.0%

b. Shipments

The amount of ore forwarded from the mine, in relation to production, showed a sharp decline from the high mark established in 1943. The 1944 total was divided as follows:

<u>Grade</u>	<u>Pocket</u> <u>Tons</u>	<u>Stockpile</u> <u>Tons</u>	<u>Total</u> <u>Tons</u>
Morris Standard	120,844	115,920	236,764
Morris Silicious	45,266	37,903	83,169
Total	166,110	153,823	319,933

The above total tonnage comprised shipments of 67,040 tons of fee ore, and 252,893 tons of lease ore.

A table showing shipments from the mine for the past five years, and the fact that the 1944 total was the lowest for the period, is as follows:

<u>Year</u>	<u>Standard Ore</u>	<u>Silicious Ore</u>	<u>Total Tons</u>
1944	236,764	83,169	319,933
1943	316,805	125,394	442,199
1942	307,101	89,670	396,771
1941	270,211	64,052	334,263
1940	314,407	112,851	427,258