TILDEN MINE
ANNUAL REPORT
YEAR - 1946

## 7. OPEN PIT OPERATIONS

### g. Loading Operations (Cont.)

Transportation of the ore was entirely by trucks, both in bringing ore to the crusher and in moving the ore from the pocket to stockpile. There was very little maintenance on the trucks, two of which have had five years' service. The tires have held up especially well, all of the original ones on the two older trucks still being in service. This is mostly due to the special attention that is paid to keeping the roads smooth and the floors of the pits free from loose rocks.

With the exception of blasting a shallow cut in the hillside at the West end of the pit, the work in connection with dividing the Summit Pit into an upper and lower bench was completed in 1946. The drill holes along the upper bench were completed in 1945 and everything is in readiness for a blast when a shipment of low phos. is required.

Toward the last of the year both of the 80B Type of Shovels were dismantled and one moved to the Cliffs Shaft Mine and one to the Athems Mine for stockpile loading. With the elimination of the transportation of the ore from shovel to crusher by rail and the centralizing of the loading in the East and West Pits, these two extra shovels are no longer required, and as they are much more economical on account of employing less labor, they are to be used in place of the railroad type steam shovels.

The locality and tonnages for the various shovels during the 1946 season are noted below:

| Unit | Tons | Locality |
|---|---|---|
| No. 29 Shovel | 4,632 | East end of West Pit. |
| No. 31 Shovel | 14,395 | Lower bench of East Pit. |
| No. 46 Shovel | 16,324 | Second bench of East Pit. |
| | 13,860 | Summit Pit. |
| No. 52 Shovel | 66,617 | Lower bench of West Pit. |
| | 49,699 | Stockpile. |

TILDEN MINE
ANNUAL REPORT
YEAR - 1946

## 8. COST OF OPERATING

### a. Comparative Mining Cost

| | 1946 | 1945 |
|---|---|---|
| Production | 101,968 | 197,476 |
| Operating Cost | .457 | .337 |
| General Mine Expense | .101 | .063 |
| Idle & Winter Expense | .218 | .175 |
| Stocking Ore | .025 | .010 |
| Cost of Production | .801 | .585 |
| Depreciation - Plant & Equipment | .070 | .070 |
| Depreciation - Motorized Equipment | .084 | .080 |
| Depletion - Original Cost | .003 | .003 |
| Amortization of Development | .002 | .003 |
| Amortization of Stripping | .020 | .020 |
| Taxes | .066 | .041 |
| Loading from Stockpile | .011 | .001 |
| Total Cost at Mine | 1.057 | .803 |
| Average Daily Product | 1,728 | 2,036 |
| Tons Per Man Per Day | 32.73 | 47.84 |
| Number of Days Operated (1 8-hr. Shift) | 59 | 97 |

TILDEN MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING

b. Detailed Cost Comparison

4. Open Pit Costs

| PIT OPERATING | 1946 | | 1945 | |
|---|---|---|---|---|
| Direct Ore | Amount | Per Ton | Amount | Per Ton |
| 1. Drilling & Blasting | 14,883.06 | .146 | 24,139.54 | .122 |
| 2. Power Shovels, Operating | 3,934.91 | .039 | 6,679.34 | .034 |
| 3. Power Shovels, Maintenance | 3,882.85 | .038 | 2,801.01 | .014 |
| 4. RD Tractor, Operating | 648.90 | .006 | 907.33 | .005 |
| 5. RD Tractor, Maintenance | 498.20 | .005 | 283.15 | .001 |
| 6. Euclid Trucks, Operating | 2,359.07 | .023 | 4,760.39 | .024 |
| 7. Euclid Trucks, Maintenance | 1,520.96 | .015 | 2,254.60 | .011 |
| TOTAL DIRECT ORE | 27,727.95 | .272 | 41,825.36 | .211 |
| General Pit Expense | | | | |
| 8. Water Supply | 22.30 | .000 | 507.20 | .003 |
| 9. Buildings | 173.27 | .002 | .79 | .000 |
| 10. Crushing & Screening | 10,157.46 | .099 | 12,763.61 | .065 |
| 11. General Open Pit Expense | 6,786.63 | .066 | 9,855.98 | .050 |
| 13. Open Pit Superintendence | 1,723.10 | .017 | 1.609.16 | .008 |
| 14. Waste Pile Expense | 56.15 | .001 | .79 | .000 |
| TOTAL GENERAL PIT EXPENSE | 18,918.91 | .185 | 24,737.53 | .126 |
| TOTAL PIT OPERATION | 46,646.86 | .457 | 66,562.89 | .337 |
| Stocking Tilden Crushed Ore | 2,557.04 | .025 | 1,907.70 | .010 |
| GRAND TOTAL | 49,203.90 | .482 | 68,470.59 | .347 |
| General Mine Expense | | | | |
| 16. Mining Engineering | 544.86 | .005 | 1,243.25 | .006 |
| 16A. Geological | 3.17 | .000 | 145.75 | .001 |
| 17. Mechanical & Electrical Engineering | 210.76 | .002 | 225.58 | .001 |
| 18. Analysis & Grading | 771.37 | .007 | 2,680.19 | .014 |
| 19. Safety Department | 109.35 | .001 | 96.77 | .001 |
| 20. Local & General Welfare | 186.00 | .002 | 173.00 | .001 |
| 21. Special Expense | 273.00 | .003 | 305.20 | .002 |
| 22. Ishpeming Office | 1,092.00 | .011 | 771.00 | .004 |
| 23. Mine Office | 2,305.56 | .023 | 2,434.69 | .012 |
| 24. Insurance | 358.26 | .004 | 204.06 | .001 |
| 25. Personal Injury | 377.72 | .004 | 673.88 | .003 |
| 26. Social Security Taxes | 794.78 | .008 | 874.36 | .004 |
| 27. Employees' Vacation Pay | 3,200.25 | .031 | 2,583.26 | .013 |
| TOTAL GENERAL MINE EXPENSE | 10,227.08 | .101 | 12,410.99 | .063 |
| IDLE & WINTER EXPENSE | 22,279.12 | .218 | 34,558.37 | .175 |
| COST OF PRODUCTION | 81,710.10 | .801 | 115,439.95 | .585 |
| Taxes | 6,697.83 | .066 | 8,184.38 | .041 |
| TOTAL COST AT MINE | 88,407.93 | .867 | 123,624.33 | .626 |

TILDEN MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING

b. Detailed Cost Comparison (Cont.)

Cost of Production

| Operating Pit | 1946 Cost Per Ton | 1946 % | 1945 Cost Per Ton | 1945 % |
|---|---|---|---|---|
| Labor | .330 | 56.7 | .191 | 46.5 |
| Supplies | .253 | 43.3 | .219 | 53.5 |
| Total | .583 | 100.0 | .410 | 100.0 |

The increase in the labor proportion of the cost was due mostly to the increase in wages, but also to less tons per shift in 1946 on account of more time spent in changing operations when small shipments were completed in the middle of the shift.

Days & Shifts Operating

| | 1946 | 1945 |
|---|---|---|
| 1-8-hour | 59 | 97 |

Production

| | 1946 | 1945 | Incr. | Decr. |
|---|---|---|---|---|
| Tons Produced | 101,968 | 197,476 | | 95,508 |
| Tons Shipped | 95,437 | 206,656 | | 111,219 |
| Tons Stocked | 56,230 | 6,022 | 50,198 | |
| Tons Shipped from Stockpile | 49,699 | 15,202 | 34,497 | |
| Average Product per 8-hr. Shift | 1,728 | 2,036 | | 308 |

Detail of Accounts

There was an increase in the cost of production for 1946 over 1945 of .216, and this was mostly due to the very small requirements for the year and also to the increase of 18½ cents per hour for labor, together with an approximately 20% increase in the price of supplies. Some of the separate accounts are shown below for comparison and explanation.

Power Shovel Maintenance

| | 1946 | 1945 |
|---|---|---|
| Amount | 3,882.85 | 2,801.01 |
| Cost per Ton | .038 | .014 |

This charge showed a large increase on account of the repairs to shovels being performed during the operating season in 1946, as no work was done in the spring before the pit opened, because of the strike.

TILDEN MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING

b. Detailed Cost Comparison

Detail of Accounts (Cont.)

Euclid Trucks

| | 1946 | 1945 |
|---|---|---|
| Tons Hauled | 115,828 | 235,987 |
| Operating: | | |
| Labor | 2,038.54 | 3,897.18 |
| Supplies | 320.53 | 784.66 |
| Total | 2,359.07 | 4,681.84 |
| Cost per Ton Hauled | .02036 | .0198 |
| Maintenance: | | |
| Labor | 592.07 | 1,036.23 |
| Supplies | 1,141.75 | 3,050.94 |
| Total | 1,733.82 | 4,087.17 |
| Cost per Ton Hauled | .0150 | .0173 |
| Total Cost per Ton Hauled | .03536 | .0371 |

There was much less maintenance on the trucks during 1946, but the cost per ton did not show very much decrease on account of the smaller tonnage hauled.

General Open Pit Expense

| | 1946 | 1945 |
|---|---|---|
| Amount | 6,786.63 | 9,855.98 |
| Cost per Ton | .066 | .050 |

The total amount spent to this account in 1946 was reduced by almost one-third as compared with 1945, and this was due to expense in 1945 of building a small pumphouse and also a new oil supply house. There was also much less work necessary on the roads in 1946.

General Mine Expense

| | 1946 | 1945 |
|---|---|---|
| Amount | 10,227.08 | 12,410.99 |
| Cost per Ton | .101 | .063 |

There was less cost to these accounts in 1946 due to less engineering on account of less drilling, and also a decided reduction in the analysis due to less samples taken for determinations.

TILDEN MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING

b. Detailed Cost Comparison

Detail of Accounts (Cont.)

Analysis & Grading

| | 1946 | | 1945 | |
|---|---|---|---|---|
| | Amount | Per Ton | Amount | Per Ton |
| Pit Charge | 6.00 | .000 | 208.46 | .001 |
| Laboratory Charge | 765.57 | .007 | 3,311.77 | .017 |
| Total | 771.57 | .007 | 3,520.23 | .018 |
| No. of Determinations | 876 | | 10,497 | |
| Cost per Determination | .874 | | .315 | |

There was only approximately one-fourth of the drilling done in 1946 as compared with 1945, and naturally this called for fewer samples, and the smaller product also required a less number of samples.

Employees' Vacation Pay

| | 1946 | 1945 |
|---|---|---|
| Amount | 3,200.25 | 2,583.26 |
| Cost per Ton | .031 | .013 |

The vacation expense was greater due to more men being eligible for two weeks' vacation, and also to the higher wage rate.

4. Open Pit Costs

Idle & Winter Expense

| | Labor | Supplies | Total |
|---|---|---|---|
| January | 1,214.31 | 407.98 | 1,622.29 |
| February | 1,059.24 | 375.56 | 1,434.80 |
| March | 1,126.07 | 389.91 | 1,515.98 |
| April | 1,130.55 | 761.86 | 1,892.41 |
| May | 2,104.18 | 3,094.16 | 5,198.34 |
| November | 3,832.90 | 2,612.73 | 6,445.63 |
| December | 3,008.43 | 1,161.24 | 4,169.67 |
| Total | 13,475.68 | 8,803.44 | 22,279.12 |

| | 1946 | | 1945 | |
|---|---|---|---|---|
| | Amount | % | Amount | % |
| Labor | 13,475.68 | 60.49 | 19,708.87 | 57.0 |
| Supplies | 8,803.44 | 39.51 | 14,851.80 | 43.0 |
| Total | 22,279.12 | 100.00 | 34,560.67 | 100.0 |

TILDEN MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING

b. Detailed Cost Comparison

4. Open Pit Costs

Idle and Winter Expense Detail

Pit Operating

| Direct Ore | 1946 | 1945 |
|---|---|---|
| Drilling & Blasting | | 762.27 |
| Power Shovels, Maintenance | 2,039.58 | 8,714.75 |
| RD Tractor, Maintenance | 439.62 | 1,231.39 |
| Euclid Trucks, Maintenance | 212.86 | 1,876.94 |
| Total Direct Ore | 2,692.06 | 12,585.35 |
| **General Pit Expense** | | |
| Water Supply | | 97.72 |
| Buildings | 6.68 | |
| Crushing & Screening | 7,249.78 | 7,102.17 |
| General Open Pit Expense | 5,375.02 | 6,526.79 |
| Open Pit Superintendence | 1,934.11 | 1,594.99 |
| Waste Pile Expense | | 38.46 |
| Total General Pit Expense | 14,565.59 | 15,360.13 |
| Total Pit Operating | 17,257.65 | 27,945.48 |
| **General Mine Expense** | | |
| Mining Engineering | 364.53 | 726.12 |
| Mechanical & Electrical Engineering | 11.50 | 100.97 |
| Analysis & Grading | 49.67 | 840.04 |
| Safety Department | 59.65 | 58.56 |
| Special Expense | 107.86 | 184.73 |
| Ishpeming Office Expense | 368.17 | 682.21 |
| Local & General Welfare | 59.48 | 116.88 |
| Mine Office Expense | 2,671.89 | 2,383.19 |
| Insurance | 524.57 | 443.88 |
| Personal Injury Expense | 402.68 | 255.05 |
| Social Security Taxes | 389.14 | 594.45 |
| Geological | | 68.15 |
| Total General Mine Expense | 5,009.14 | 6,454.23 |
| Inventory Loss | 12.33 | 158.66 |
| TOTAL COST AT MINE | 22,279.12 | 34,558.37 |

The total cost for Idle & Winter Expense was very much less in 1946 than in 1945, as no men were recalled for repair work until May 22nd, and then only a small proportion of the regular crew were required until June 15th. The pit was again placed on an idle basis the first of November, and only a very small crew were making necessary repairs to the last of the year. The cost per ton, however, showed an increase of .043, due to there being a reduction

TILDEN MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING

b. Detailed Cost Comparison

Idle & Winter Expense (Cont.)

of approximately 100,000 tons in the product for the year. A total reduction of almost $10,000 was made in the maintenance accounts due to a general overhaul of Nos. 1 and 2 trucks and #46 Shovel in 1945. Drilling, Engineering, and Analysis also showed a substantial decrease in amount expended, due to there being no drilling program during the idle period in 1946, whereas it was found necessary to complete drilling in the East and West Pits in the spring of 1945.

10. TAXES

Tilden Township
Tilden Mine

| | 1946 | | 1945 | |
|---|---|---|---|---|
| | Valuation | Taxes | Valuation | Taxes |
| N ½ of Sec. 26, 47-27 | 200,000 | 3,736.06 | 280,000 | 5,215.95 |
| Personal Supplies & Equip. | 155,000 | 2,895.45 | 155,000 | 2,887.40 |
| Total | 355,000 | 6,631.51 | 435,000 | 8,103.30 |
| Collection Fees | | 66.32 | | 81.03 |
| Total Tilden Mine | 355,000 | 6,697.83 | 435,000 | 8,184.33 |

11. PERSONAL INJURY

There were no major and only one very minor accident to employees during 1946.

12. NEW CONSTRUCTION AND PROPOSED NEW CONSTRUCTION

There was no new construction during 1946, nor is there any contemplated for 1947.

13. EQUIPMENT AND PROPOSED NEW EQUIPMENT

Both of the 80B - Bucyrus-Erie Shovels were dismantled and transferred to other C.C.I.Co. properties during the year.

There was no new equipment purchased during the year, and the only purchase to be made in 1947 is that of a portable compressor to reduce the cost of drilling for secondary blasting.

# ATHENS MINE
# ANNUAL REPORT
# YEAR - 1946

## 1. GENERAL:

The Athens Mine operated six days per week, two shifts per day during 1946. The mine was idle from February 8th to May 21st inclusive due to the labor union strike for higher wages. In July about fifteen men were transferred to the Athens Mine from the Princeton Mine which had closed down following the strike due to fact it was so badly crushed. In order to take these men on it was necessary to organize a third shift in the fourth level area and this schedule was then continued for the balance of the year.

On February 8th the labor union called a strike in demand of higher wages and it continued until May 21st (dates inclusive). The strike was finally settled with an increase in wages of eighteen and one half cents per hour which was the national pattern for other strike settlements throughout the country. Maintenance work during this period was carried on by regular crews which were allowed to work. However, in order to bring greater pressure to bear the Union called off these employees on the 18th of March and the maintenance was then continued by our supervisory force who did a very commendable job.

Following the strike period it was necessary to carry on a heavy program of repair work in order to keep levels and working places open for production. The supervisory force carried on repair maintenance during the strike but it was impossible for them to make all necessary repairs and consequently only the most important work was done. By September this work was caught up and the regular crews continued with a normal amount of repair work.

Production in 1946 was 367,361 tons as compared to 438,427 tons in 1945, a decrease of 71,066 tons. The decrease was due to the fact that the mine was idle from February 8th thru May 21st. The total number of man days during the operating period was 72,915 as compared to 90,217 in 1945. The tons per man per day increased from 4.86 in 1945 to 5.04 in 1946. About 70% of the total product came from fourth and eighth levels and smaller amounts from sixth, ninth and tenth levels.

The total shipments in 1946 amounted to 352,348 tons as compared to 407,282 tons in 1945. At the end of the shipping season there was left in stock about 6,000 tons of Mitchell ore and a somewhat larger tonnage of wet Athens ore.

Two main level cross cuts were extended during the year namely the 860 cross cut on 8th level and the 950 cross cut on 9th level. The 9th level cross cut was started late in 1945 and was completed in September. The 860 cross cut was started in June and completed in August. Other development work consisted of raising from the above drifts as well as additional raises from old drifts on other levels. The 860 cross cut was advanced in order to complete sub caving operations south of the dike and west of the fire pillar. In September it was decided to use this cross cut for block caving development of the old fire pillar area also. This work was started in September and it is expected that the development will be completed by September of next year.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

1. GENERAL: (CONT'D)

The sub level caving system of mining was applied to additional mining areas during the year. It has become evident that it will not work to satisfaction in all areas but does show improvement in efficiency and saving in timber costs where it does work. By the end of the year there were fourteen contracts on sub level caving and nine on top slicing. The number of sub caving contracts will be reduced next year as certain areas where it is now being used does not lend itself to this system of mining.

The safety record at the mine was very good in 1946, having a position rating of third with nine underground properties. This rating is based on severity which is the number of days lost per thousand man hours worked. There were eleven compensable accidents as compared to fourteen in 1945 and twenty one in 1944. One accident incurred lost time over four months, two accidents from one to four months and eight accidents less than one month.

2. PRODUCTION SHIPMENTS AND INVENTORIES:

a. Production By Grades:

| | 1946 | 1945 | Increase | Decrease |
|---|---|---|---|---|
| Athens Ore | 275,547 | 350,322 | | 74,775 |
| Mitchell Lease Ore | 91,814 | 88,105 | 3,709 | |
| Corbit Lease Ore | 0 | 0 | | |
| Total Ore | 367,361 | 438,427 | | 71,066 |
| Rock | 12,965 | 12,365 | 600 | |
| Total Hoist | 380,326 | 450,792 | | 70,466 |

b. Shipments:

| Grade of Ore | Pocket Tons | Stockpile Tons | 1946 Total Tons | 1945 Total Tons |
|---|---|---|---|---|
| Athens Ore | 171,373 | 98,236 | 269,609 | 322,310 |
| Mitchell Lease Ore | 64,587 | 18,152 | 82,739 | 84,972 |
| Corbit Lease Ore | 0 | 0 | 0 | 0 |
| Total | 235,960 | 116,388 | 352,348 | 407,282 |
| Total Last Year | 266,286 | 140,996 | 407,282 | |
| Increase | | | | |
| Decrease | 30,326 | 24,608 | 54,934 | |

c. Stockpile Inventories:

| Grade Of Ore | Dec. 31, 1946 | Dec. 31, 1945 | Increase |
|---|---|---|---|
| Athens Ore | 55,336 | 49,398 | 5,938 |
| Mitchell Lease Ore | 17,666 | 8,591 | 9,075 |
| Total | 73,002 | 57,989 | 15,013 |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

2. PRODUCTION SHIPMENTS AND INVENTORIES: (CONT'D)

d. Division Of Product By Levels:

| | 1946 Tons | 1946 Percent | 1945 Tons | 1945 Percent |
|---|---|---|---|---|
| 4th Level | 148,332 | 40.4 | 207,942 | 47.4 |
| 6th Level | 53,552 | 14.6 | 12,653 | 2.9 |
| 7th Level | | | 3,606 | .8 |
| 8th Level | 112,470 | 30.6 | 205,982 | 47.0 |
| 9th Level | 20,563 | 5.6 | 551 | .1 |
| 10th Level | 32,444 | 8.8 | 7,693 | 1.8 |
| Total | 367,361 | 100. | 438,427 | 100. |

e. Production By Months:

| Month | Athens | Mitchell | Total | Rock |
|---|---|---|---|---|
| January | 30,255 | 8,378 | 38,633 | 1,125 |
| February | 7,187 | 2,703 | 9,890 | 195 |
| March | 843 | 196 | 1,039 | 50 |
| April | 0 | 0 | 0 | 0 |
| May | 7,536 | 1,306 | 8,842 | 525 |
| June | 27,933 | 11,250 | 39,183 | 1,585 |
| July | 33,105 | 10,871 | 43,976 | 2,080 |
| August | 31,943 | 12,175 | 44,118 | 2,480 |
| September | 34,207 | 10,375 | 44,582 | 1,735 |
| October | 34,824 | 11,563 | 46,387 | 1,550 |
| November | 30,372 | 11,933 | 42,305 | 835 |
| December | 33,433 | 11,064 | 44,497 | 805 |
| Total 1946 | 271,638 | 91,814 | 363,452 | 12,965 |
| Current Year's Stockpile Overrun | 3,909 | 0 | 3,909 | 0 |
| Total 1946 | 275,547 | 91,814 | 367,361 | 12,965 |
| Total 1945 | 350,322 | 88,105 | 438,427 | 12,365 |
| Increase | | 3,709 | | 600 |
| Decrease | 74,775 | | 71,066 | |

f. Ore Statement:

| | Athens | Mitchell | 1946 Total | 1945 Total |
|---|---|---|---|---|
| On Hand January 1, 1946 | 49,398 | 8,591 | 57,989 | 26,844 |
| Output For Year | 271,638 | 91,814 | 363,452 | 416,771 |
| Prior Years Stockpile Overrun | 0 | 0 | 0 | 0 |
| Current Year's Overrun | 3,909 | | 3,909 | 21,656 |
| Total | 324,945 | 100,405 | 425,350 | 465,271 |
| Shipments | 269,609 | 82,739 | 352,348 | 407,282 |
| Balance on Hand | 55,336 | 17,666 | 73,002 | 57,989 |
| Decrease in Output | 60,687 | | 53,319 | |
| Increase in Output | | 7,368 | | |
| Increase in Ore On Hand | 5,938 | 9,075 | 15,013 | |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

2. PRODUCTION SHIPMENTS AND INVENTORIES: (CONT'D)

f. Ore Statement: (Cont'd)

| Grade of Ore | Pocket | Stockpile | 1946 Total | 1945 Total |
|---|---|---|---|---|
| Athens Ore | 171,373 | 98,236 | 269,609 | 322,310 |
| Mitchell Lease Ore | 64,587 | 18,152 | 82,739 | 84,972 |
| Total | 235,960 | 116,388 | 352,348 | 407,282 |
| Total Last Year | 266,286 | 140,996 | 407,282 | |
| Decrease in Shipments | 30,326 | 24,608 | 54,934 | |

g. Delays:

February 8th to May 21st inclusive

The mine was idle account of C.I.O. Union strike.

July 31st - 3 Hour Delay - Loss of Product 300 Tons

Ore hung up in skip pit making it necessary to hoist with one skip until it was brought down.

October 8th - 8 Hours - Loss of Product 400 Tons

The skip jumped the runner and jammed in the shaft causing an eight hour delay to hoisting while it was removed and new runners installed. The miners worked however.

3. ANALYSIS:

a. Average Mine Analysis On Output:

| | 1946 | | | | 1945 | | | |
|---|---|---|---|---|---|---|---|---|
| Grade | Tons | Iron | Phos. | Sil. | Tons | Iron | Phos. | Sil. |
| Athens | 275,547 | 58.94 | .124 | 8.35 | 332,325 | 59.21 | .115 | 7.98 |
| Mitchell | 91,814 | 59.19 | .120 | 8.20 | 84,446 | 59.52 | .119 | 7.64 |

b. Average Analysis On Straight Cargoes:

| Grade | Mine | Lake Erie |
|---|---|---|
| Athens Ore | None | None |
| Mitchell Lease Ore | None | None |

c. High Sulphur Ore:

No high sulphur ore was encountered in the mine in 1946.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

4. ESTIMATE OF ORE RESERVES:

a. Developed Ore:

Assumption: 12.75 Cubic feet equals one ton
10 percent for rock and loss in mining
Percent of Bessemer - None

| | Athens Lots 1, 7, 10 & 12 | Mitchell Lease Lots 8, 9 & 11 | Corbit Lease Lot 13 | Total Tons |
|---|---|---|---|---|
| 4th Level & Above | 256,439 | 163,769 | 479,694 | 899,902 |
| 4th to 6th Level | 549,130 | 572,010 | 22,880 | 1,144,020 |
| 6th to 7th Level | 234,548 | 75,835 | | 310,383 |
| 7th to 8th Level | 357,777 | | | 357,777 |
| 8th to 9th Level | 306,931 | | | 306,931 |
| 9th to 10th Level | 456,247 | | | 456,247 |
| Below 10th Level | 70,490 | | | 70,490 |
| New Ore Body North of Big Dike | 354,216 | | | 354,216 |
| Total Gross Tons As Of Nov. 30, 1946 | 2,585,778 | 811,614 | 502,574 | 3,899,966 |
| Less December 1946 Production | 33,433 | 11,064 | | 44,497 |
| Total Gross Tons as of December 31, 1946 | 2,552,345 | 800,550 | 502,574 | 3,855,469 |
| Less 10% For Mining & Rock | 258,578 | 81,161 | 50,257 | 389,996 |
| Net Tons 1946 | 2,293,767 | 719,389 | 452,317 | 3,465,473 |
| Net Tons 1945 | 2,417,734 | 863,331 | 474,976 | 3,756,041 |
| Decrease | 123,967 | 143,942 | 22,659 | 290,568 |

The table shows a decrease of 290,568 tons. Subtracting this figure from the production of 367,361 tons indicates that 76,793 tons were developed. Actually this is not true because approximately 140,000 tons classed unavailable last year was included in the estimate this year. This will actually show a loss in reserves which is due to a reduction in areas, expecially on the 4th level where the south footwall is coming in more rapidly than expected.

b. Prospective Ore:

All the ore in the mine is developed.

c. Estimated Analysis:

Ore Reserves — Approximate Expected Natural Analysis

| | Tons | Iron | Phos | Sil | Mang. | Alum. | Lime | Mag. | Sul. | Loss | Moist |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Athens | 3,465,473 | 51.50 | .100 | 7.17 | .350 | 2.75 | .490 | .760 | .009 | 1.30 | 13.08 |

Ore In Stock — Average Natural Analysis

| | Tons | Iron | Phos | Sil | Mang. | Alum. | Lime | Mag. | Sul. | Loss | Moist |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Athens | 55,336 | 51.24 | .119 | 7.17 | .313 | 2.88 | .391 | .749 | .010 | 1.46 | 12.95 |
| Mitchell | 17,666 | 51.54 | .115 | 6.88 | .313 | 2.64 | .564 | .694 | .009 | 1.35 | 13.25 |

ATHENS MINE
ANNUAL REPORT
YEAR 1946

5. LABOR AND WAGES:

a. Comments:

The average number of employees for the operating period in 1946 was 336 as compared to 306 in 1945. There were 76 men added to our payroll while 49 left our payroll making a net gain of 27 men. Of the men that were hired 42 were returned veterans, 19 were new men and 15 were transfers from the Princeton mine. Of the men that left our payroll, 32 quit, 2 were laid off because of curtailment of the surface crew, 4 were transferred to other mines, 11 were retired and 2 died.

b. Comparative Statement Of Wages And Product: (Based on operating period for 1946.)

| | 1946 | 1945 | Increase | Decrease |
|---|---|---|---|---|
| PRODUCT | 367,361 | 438,427 | | 71,066 |
| No. Shifts & Hours | 1-8 3 | 1-8 10 | | 7 |
| | 2-8 215 | 2-8 291 | | 76 |
| * Average No. Men Working: | | | | |
| Surface | 64 | 66 | | 2 |
| Underground | 272 | 240 | 32 | |
| Total | 336 | 306 | 30 | |
| * Average Wages Per Day: | | | | |
| Surface | 9.33 | 7.56 | 1.77 | |
| Underground | 10.27 | 8.71 | 1.56 | |
| Total | 10.09 | 8.47 | 1.62 | |
| * Average Wages Per Month: (Based on mine payroll including Captain & Clerks) | | | | |
| Surface | 238.04 | 184.68 | 53.36 | |
| Underground | 258.43 | 214.44 | 43.99 | |
| Total | 254.55 | 208.02 | 46.53 | |
| Product Per Man Per Day: | | | | |
| Surface | 25.72 | 22.66 | 3.06 | |
| Underground | 6.24 | 6.19 | .05 | |
| Total | 5.04 | 4.86 | .18 | |
| Labor Cost Per Ton: | | | | |
| Surface | .357 | .341 | .016 | |
| Underground | 1.645 | 1.459 | .186 | |
| Total | 2.002 | 1.800 | .202 | |
| Average Product Mining: | | | | |
| Stoping | 22.42 | 23.11 | | .69 |
| Development In Ore | 9.06 | 14.87 | | 5.81 |
| Total | 21.87 | 21.77 | .10 | |

* Exclusive of idle period.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

5. LABOR AND WAGES: (CONT'D)

b. Comparative Statement of Wages and Product: (cont'd)

| * Average Wages Per Day For Contract Miners: | 1946 | 1945 | Increase | Decrease |
|---|---|---|---|---|
| | 11.02 | 9.35 | 1.67 | |
| **Total Number of Man-Days:** | | | | |
| Surface | 14,042¼ | 19,346¼ | | 5,304 |
| Underground | 58,872 3/4 | 70,870¼ | | 11,997½ |
| Total | 72,915 | 90,216½ | | 17,301½ |
| **Amount For Labor** | | | | |
| Surface | 131,019.05 | 146,265.60 | | 15,246.55 |
| Underground | 604,531.95 | 617,593.43 | | 13,061.48 |
| Total | 735,551.00 | 763,859.03 | | 28,308.03 |

* Average Wages Per Month as Per Labor Statement - Less Captain & Clerks:

| | | | |
|---|---|---|---|
| Surface | 235.61 | 186.04 | 49.57 |
| Underground | 260.06 | 213.63 | 46.43 |
| Total | 255.35 | 208.02 | 47.33 |

Proportion Of Surface To Underground Men:

1946 - 1 to 3.88
6 2-8 hour shifts.

1945 - 1 to 3.64
5 2-8 hour shifts January 1st to January 22nd.
6 2-8 hour shifts January 22nd to December 31, 1945.

c. Operating Schedules - 1946:

| Month | Days Mine Worked Per Week | Days Per Month | Days Men Worked Per Week | Avg. Shifts Worked Per Month By Each Man |
|---|---|---|---|---|
| January | 6 | 26 | 6 | 26 |
| February | 6 | 6 | 6 | 6 |
| March | 0 | 0 | 0 | 0 |
| April | 0 | 0 | 0 | 0 |
| May | 6 | 8 | 6 | 8 |
| June | 6 | 25 | 6 | 25 |
| July | 6 | 26 | 6 | 26 |
| August | 6 | 26 | 6 | 26 |
| September | 6 | 24 | 6 | 24 |
| October | 6 | 27 | 6 | 27 |
| November | 6 | 25 | 6 | 25 |
| December | 6 | 25 | 6 | 25 |
| Total | | 218 | | 218 |

Average For Year Mine Operated 18.17
Average For Year Worked By Each Man 18.17

* Exclusive of idle period.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

6. SURFACE:

a-1. Buildings:

In January an extension of the engine house roof was made over the new door at the southeast entrance as a safety precaution to prevent any ice from falling on the men as they entered.

A stoker was installed during the summer in the main boiler in the dry house. At this same time return condensate lines were put in from the shaft house down thru the tunnel and back to the boiler. A considerable saving in fuel is realized by returning all condensate water to the boiler.

The window casings in the main office were repaired during the summer with some new strips being installed. The windows had become loose and were very drafty in the winter.

Repairs on other buildings consisted of general maintenance with no major work being done.

a-2. Docks, Trestles And Pockets:

Repairs were continued in the shaft house during the summer. New supports were installed in the skip dump as well as new beams supporting the landing platform and top tram cars. Some new steel beams were also installed at the collar of the shaft replacing the old wood timbers which had rotted.

A new stoker coal bin was constructed under the coal dock near the boiler house. A door was cut thru the north wall of the boiler house so the stoker can now be filled from inside the boiler house.

b. Stockpiles:

(1) Ore:

Athens ore was stocked under the east steel trestle and Mitchell under two bents of the south steel trestle. Loading from stockpile was not started until the later part of May due to the labor union strike. In November stockpile loading was concluded with some ore of both leases remaining in stock.

(2) Rock:

The rock was stocked under the short wooden trestle extending to the southwest. As the rock accumulated it was pushed over the side of the rock pile with the Negaunee Mine bulldozer.

c. Cave To Surface:

The limits of the cave remained approximately the same. The only change was continued settlement within present breaks.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

6. SURFACE: (CONT.)

d. Deep Wells:

No. 1 Deep Well continued operating throughout the year. A daily inspection of the pump was made to be sure that it was in good running order.

No. 2 Deep Well pump did not operate in 1946.

BREITUNG SHAFT:

Pumping was continued throughout the year from the Breitung Shaft. During the summer it was necessary to replace the pump with a spare as the motor was burned out following an electrical storm.

e. Water Purchased For Heating, Cooling, etc.:

The cost of water purchased from the City of Negaunee the last three years is as follows:

| | 1946 | | 1945 | | 1944 | |
|---|---|---|---|---|---|---|
| | Gallons | Amount | Gallons | Amount | Gallons | Amount |
| 1st Quarter | 4,738,000 | 334.66 | 3,919,000 | 280.83 | 4,428,000 | 207.94 |
| 2nd Quarter | 5,526,000 | 389.82 | 4,763,000 | 339.91 | 4,206,000 | 297.42 |
| 3rd Quarter | 6,178,000 | 435.46 | 4,921,000 | 350.97 | 3,964,000 | 280.48 |
| 4th Quarter | 6,425,000 | 452.75 | 5,503,000 | 391.71 | 3,742,000 | 264.84 |
| Total | 22,867,000 | 1,612.69 | 19,106,000 | 1,363.42 | 16,340,000 | 1,155.70 |
| Product - Tons | 367,361 | | 438,427 | | 421,153 | |
| Cost Per Ton | .004 | | .003 | | .003 | |

f. Grounds And Fences:

The grounds around the mine buildings were maintained in good condition during the summer. It was necessary to do considerable watering of the lawns due to lack of rainfall.

The parking area for automobiles was enlarged to the east in order to provide more space. This is particular necessary in the winter when a portion of the lot should be left clean of cars so the plows or bulldozer can get a chance to push the snow away.

Fences around the cave were inspected during the summer and all necessary repairs were made.

7. UNDERGROUND:

a. Shaft Sinking:

There was no shaft sinking in 1946.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

7. UNDERGROUND: (CONT'D)

b. Development, General Remarks:

In order to provide additional working places and continue mining in established areas it was necessary to extend cross cuts on 8th and 9th levels during the year. In addition raises were put up from the levels for mining purposes. On tenth level at the shaft the tail track was enlarged and a trench was blasted about eight feet deep on the east side for ore and rock storage.

Development work was delayed during the strike and it was late in the year before we were able to start some necessary work which was originally planned to start early in the year.

In September it was decided to start development for block caving the ore located south of the dike in blocks 3 and 4. This is the block comprising the main fire pillar. This decision was reached after consultation with and inspection by men who are experienced in this type of mining. We are hopeful that this system of mining will work to satisfaction because with rising labor costs it is necessary that we find some method to improve efficiency.

Development footages as shown on the tables decreased considerably in 1946 as compared to 1945. This was due largely to the fact that in 1945 development on sub levels was included under this heading and in 1946 only main level development, rock development and raises being put up from main levels were included under the classification of development. Also, the mine was idle for 3 months which would undoubtedly effect the total footage.

Under new development planned for 1947 we are considering the new ore body located north of the large diorite dike. Drifting will be started on 9th level early in 1947 and raises will be put up to the 8th level elevation for mining and exploration.

b-1. Development in Ore:

4th Level:

Development on this level consisted of 141 feet of ore raising. A new raise namely No. 400 was put up from the main drift from shaft in order to continue mining in the west end adjacent to the north footwall. No. 401 raise had been used up to this time but the cross cut and raise crushed so badly that it was impossible to repair them. No. 412 raise was started from the southeast cross cut between No. 413 and No. 417 raise. This raise will be put up to facilitate mining in area now being mined from No. 413 and No. 415 raises. Smaller amounts of development footages were done on one of the sub levels above in connection with mining operations.

5th and 6th Levels:

There was no development work on these levels during 1946.

7. UNDERGROUND: (CONT'D)

b-1. Development in Ore: (Cont'd)

7th Level:

A small amount of ore drifting was done on 7th level in connection with mining operations.

8th Level:

A portion of the extension of No. 860 cross cut was ore development as well as No. 875 raise which was started from the main level. In addition, top timber development for block caving operations in the old fire area was started late in the year and 80 feet of transfer drift was driven in ore.

9th Level:

A total of 126 feet of ore drifting was included under the heading of development in 1946. About 60 feet of ore drift was advanced while developing the new cross cut south of No. 1002 ventilation raise. The remainder was in connection with mining operations in block No. 2.

A total of 280 feet of double cribbed ore raise was put up from the 9th level during the year. Raise No. 966 which was started in 1945 was completed to the -735' sub level above 8th level. Raise No. 952 was started from the new cross cut and by November was completed to the -770' sub level above 8th level.

10th Level:

There was no ore development on 10th level in 1946.

The following is a summary of the development footages in ore in 1946:

| Location | Drifting | Raising | Total |
|---|---|---|---|
| -290' Sub Level | | 32 | 32 |
| 4th Level | | 141 | 141 |
| 7th Level | 45 | | 45 |
| -745' Sub Level | 34 | 42 | 76 |
| -780' Sub Level | 80 | 49 | 129 |
| 8th Level | 110 | 15 | 125 |
| 9th Level | 126 | 280 | 406 |
| -905' Sub Level | | 12 | 12 |
| -930' Sub Level | | | |
| Total 1946 | 395 | 571 | 966 |
| Total 1945 | 3914 | 1182 | 5096 |
| Decrease | 3519 | 611 | 4130 |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

7. UNDERGROUND: (CONT'D)

b-2/ Development in Rock:

4th Level:

There was no Rock development on the main level during 1946. Some rock drifting was done on sub levels above during the progress of mining.

5th, 6th and 7th Levels:

There was no rock development on these levels during the year.

8th Level:

A total of 184 feet of rock drift was advanced while developing the extension to No. 860 cross cut. This cross cut was put in to continue mining in the old fire area. Mining had previously been done fromthe No. 810 cross cut but during the strike a mud run occurred in No. 814 raise making it necessary to abandon mining operations from that side.

A total of 113 feet of rock raise was put up during the year. Most of this was done while advancing No. 875 raise and a partion was also developed while making top timber cut outs for the block caving development.

9th Level:

Contract No. 10 completed No. 950 cross cut on 9th level with 237 feet of rock drifting. Raises were then started from this drift with 14 feet of rock raise being advanced at the start of No. 952. Three raises are being put up to continue mining in block No. 3 above 8th level.

10th Level:

A total of 60 feet of rock trenching was done at the shaft station where a trench was being put in. This trench is for storage and also for handling skip pit mud from below. A total of 60 feet of rock drifting was also done on sub levels above in connection with drainage development in block No. 2.

The following is a summary of rock development lin 1946:

| Location | Drifting | Raising | Total |
|---|---|---|---|
| -315' Sub Level | 20 | | 20 |
| -330' Sub Level | 43 | | 43 |
| -745' Sub Level | 12 | | 12 |
| 8th Level | 184 | 113 | 297 |
| 9th Level | 237 | 14 | 251 |
| -930' Sub Level | 35 | | 35 |
| -955' Sub Level | 25 | | 25 |
| 10th Level | 60 | | 60 |
| Total 1946 | 616 | 127 | 743 |
| Total 1945 | 194 | 329 | 523 |
| Increase | 422 | | 220 |
| Decrease | | 202 | |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

7. UNDERGROUND: (CONT'D)

C. Stoping:

(1) General:

The product in 1946 was obtained from approximately the same areas and mining blocks as in previous years. Mining was again resumed in block No. 2 on the 9th level where operations were stopped during most 1945. Ore was mined on five different levels during the year with 71% of the products coming from 4th and 8th levels. The remaining 29% came from 6th, 9th and 10th levels with about 14.6% from 6th level. As new raises are put up and additional mining places developed under the capping on fourth level production from the 6th level will increase. A corresponding decrease will be noted on 4th level until the Corbit Lot is developed which will be some time im 1948. There was no mining at all on the 7th level.

During the year there were additional top slicing areas changed to the sub level caving system of mining. By December there were 14 contracts on sub level caving work and 9 on top slicing. Three were on development making a total of 26 contracts. It is now apparent however that the sub level caving system of mining is not practical and efficient in all of the areas at the Athens Mine. As a result of this experience some of the areas now being mined by sub level caving will be changed back to top slicing.

The locations of the mining contracts at the end of the year 1946 and 1945 are shown below:

| 1946 | | 1945 | |
|---|---|---|---|
| 9 | Above 4th level | 12 | above 4th level |
| 3 | above 6th level | 0 | above 6th level |
| 0 | above 7th level | 5 | above 7th level |
| 9 | above 8th level | 6 | above 8th level |
| 1 | above 9th level | 3 | above 9th level |
| 4 | above 10th level | 2 | above 10th level |
| Total 26 | | Total 28 | |

The Contracts were divided as follows:

| 1946 | | 1945 | |
|---|---|---|---|
| Mining - | 9 top slicing | Mining - | 23 top slicing |
| | 14 sub caving | Developing - | 1 raising |
| Developing - | 1 raising | | - 4 drifting |
| | 2 drifting | | |
| Total | 26 contracts | Total | 28 contracts |

Above the 4th level elevation ore was mined in 1946 on the -230', -245', -260', -275', -290', -300', -315', -330', -340', -355', -365', -375', sub levels and on 4th level.

Between 4th and 6th levels ore was mined on the -405' sub level.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

7. UNDERGROUND: (CONT'D)

C. Stoping: (Cont'd)

(1) General: (Cont'd)

Between 6th and 7th levels ore was mined on the -625', -635', -645', -660', -675' sub levels and on 7th level. All of this ore was trammed on the 8th level.

Between 7th and 8th levels ore was mined on the -710', -720', -735', -760', -770', -780' sub levels.

There was ore mined from the -865', and -875' sub levels above 9th level as the result of operations at the 9th level elevation.

Between 9th and 10th levels ore was mined on the -905', -920', -930', -940', -955' sub levels.

(2) Detail of Stoping:

Blocks 5 and 6 above 4th level:

Mining was continued in Athens Lot No. 12 around No. 415 and No. 417 raise with the radial sub caving system being used. By the end of the year operations were down to the -290' sub level which was just being developed. The radial sub caving system was used ~~after as~~ it was found that it is impossible to develop a transfer and mining drift within 25 feet of elevation and maintain it long enough to continue mining. The system worked with some degree of success but generally the ore in this area does not lend itself too well to this system because it breaks up in large masses. It is then necessary to do considerable secondary blasting and breaking with a chunk breaker. Mining from No. 417 raise was abondoned late in the year due to the fact that the raise crushed beyond repair. A new raise will be put up from the level with a transfer for additional raises in this area.

Mining from No. 413 raise was discontinued late in the year in order to make repairs in the raise. One compartment was repaired and by the time the second compartment was half repaired it was necessary to abandon it due to excessive pressure which crushed the raise. The ore in this area will be mined from transfer raises as mentioned in the preceeding paragraph.

In Mitchell Lease Lot No. 11 around No. 414 and No. 416 raises mining was completed on the -300', -315' and -330' sub levels. In December development of the -340' sub level was well under way.

In December No. 14 contract completed two slices on the -330' sub level west to the jasper capping. This nearly completes the mining on this sub level and the contract will then move to the next lower sub level. No. 22 contract working at No. 416 raise completed cutting and timbering over the raise and then continued mining to the south. The first drift and one slice were completed to the old workings. At the end of the month a second slice was advancing in this same direction.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

7. UNDERGROUND: (CONT'D)

c. Stoping: (Cont'd):
(2) Detail of Stoping: (Cont'd)
Blocks 5 and 6 above 4th level: (Cont'd)

In the Athens Lot No. 10 along the north footwall mining was continued from No. 401 raise by No. 1 contract. Mining was completed on the -315' and -330' sub levels. By this time the raise and main level below had crushed so badly due to tremendous pressure that it was necessary to put up a new raise from the main drift near No. 402 raise. Late in the year mining was started from this new raise on the -355' sub level. The caving system is being used with slices that extend north to the dike. Some time next year it will be necessary to put up new raises from 6th level in order to continue mining in this area.

In the Mitchell Lease Lot No. 11 and Athens Lease Lot No. 12 along the south footwall mining was continued by contracts No. 8, 12, 29, and 31. This area is rapidly becoming smaller and it was necessary to transfer No. 29 contract to another area early in the year. Mining was completed on the -340' sub level which had just been opened in 1946. By the end of the year mining was near completion on the -355' sub level. During the month of December, contract No. 31 working from No. 418 raise advanced a slice 90 feet southwest toward the old workings. Contract No. 12 working from No. 420 raise completed three slices west to the old workings. At the end of the month a fourth slice was advancing in this same direction. Contract No. 8 working from No. 419 raise continued mining northeast from the raise.

In December contract No. 32 completed timbering over No. 412 raise on the -365' sub level. A transfer will be driven to the northeast from which raises will be put up to continue mining in the area around No. 413 and No. 417 raises.

In the Athens and Mitchell Leases between the south footwall and jasper capping mining was completed on the 4th level elevation. Contracts No. 7 and No. 30 started mining from the new raise up from 6th level and later in the year contract No. 25 was transferred to this area and started mining from No. 650 raise. Toward the end of the year the contracts moved down to the -405' sub level 25 feet below.

Between 4th and 6th Levels:

The -405' sub level was opened late in the year in the area mentioned in the last paragraph above. Contract No. 25 cut out No. 650 raise and drove a ventilation and traveling connection to the 4th level main drift. When this was completed drifting was started to the south toward No. 651A raise. This work was done during the month of December. In September contract No. 29 cut out and timbered over No. 651B raise. A connection was then driven northwest to No. 651A raise. Progress was slow due to wet conditions and loose ground in the back of the drift. Contract No. 30 then completed timbering over No. 651 A raise and contract No. 29 started mining to the northeast toward the mining limit. In December contract No. 30 completed the first drift 140 feet southwest to the old workings in block No. 4. Caving operations were started late in the month.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

7. UNDERGROUND: (CONT)

c. Stoping: (Cont)

Between 6th and 7th Levels:
Ore Area South of Cross Dike - Block No. 3

Sub level caving operations were continued on the -660' sub level until February 7th at which time the men went out on a strike. Only two slices remained to be mined from No. 816A raise at this time and unfortunately they were to be of the best mining conditions in this area. During the strike period a mud run occurred in No. 814 raise filling the 8th level drift with mud. The mining tools were then removed from the area thru a traveling and ventilation connection at the east end of the block. Upon return of the men after the strike an attempt was made to clean the main level drift but the mud would surge fourth each time and as a safety precaution it was decided to abandon all attempts to reach this mining area from the 810 cross cut. The east end of this area is comparatively dry and it was decided to extend No. 860 cross cut to the south far enough to put up a raise into this same area and continue mining. The raise was completed to the -710' sub level in November and mining operations will soon be started again in this area.

South of Cross Dike - Block 4 - 7th Level

Late in the year stoping operations were started in the old 30' fire pillar which had been established on 6th level at the time of the first fire in 1941. A one sub stope was opened with the transfer on the -710' sub level. Good recovery is being realized and in December Contract No. 3 continued benching until the stope opening reached the traveling raise. When all the ore was recovered on the sub levels the contract moved down and caved the end of the transfer drift.

North of Cross Dike - Block 4 - 7th Level

Sub level caving operations which was started on the 7th level elevation early in the year was completed about July month. Contracts No. 15 and No. 18 then moved to the next lower sub level.

Between 7th and 8th Levels
North of Cross Dike - Block 4

Contracts No. 15 and No. 18 started sub caving on the -710' sub level in July and by December had nearly completed recovery of all the ore in this area at this elevation. Considerable difficulty is experienced while sub caving in this area. The ore is fairly hard to drill and does not cave readily. When a heavy fall occurs it packs so hard that it is then difficult to make it run out into the slice.

South of Cross Dike - Block 4 and 5

Contract No. 3 completed sub level caving operations in the block of ore east of No. 866 raise. The last sub to be mined was the -760' sub level where the ore body was only one slice wide. The contract then moved to No. 865 raise on the -710' sub level. It was decided to mine by stoping the old 30' fire pillar which was established in 1941 at the time of the first fire.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

7. UNDERGROUND: (CONT'D)

c. Stoping: (Cont'd)
South of Cross Dike - Block 4 and 5: (Cont'd)

A transfer drift was driven to the southeast and sub level stoping operations were then started. By December operations southeast of the raise were completed and the contract then advanced a second transfer to the northwest.

North of Cross Dike - Block 3

This portion of Block 3 is divided into two mining blocks by a limit. In the west portion 3 contracts continued mining throughout the year. Mining was completed on the -735' sub level and by the end of the year mining was near completion on the -745' sub level. During the year a new raise from 9th level was put up to this area. In the block to the east 2 contracts completed mining on the -745' and -760' sub levels. When the -770' sub level was opened one contract was transferred to another area. In December Contract No. 2 timbered over No. 862 raise and advanced a connection west to No. 952 raise which was completed to this elevation during the year.

Between 8th and 9th Levels

Mining operations were actually carried on at the 9th level elevation but mined areas are shown on sub levels above which are the result of caving operations. Early in the year mining was again resumed in block 2 at 9th level. This area was developed for sub level caving operations and by December mining was completed on 9th level. The three contracts working in this area then moved to the -920' sub level.

Between 9th and 10th Levels

Contract No. 6 working in the extreme west portion of Block 2 cut out No. 1038 raise and advanced drainage drifts northwest and southeast. Some mining was also done in the area southeast from No. 1038 raise. This work is being done in advance of regular mining operations in order to drain the water which occurs along the old workings in block 1. By December this drainage development contract was working on the -955' sub level. Regular sub level caving operations reached the -920' sub level where three contracts were working.

d. Timbering:

The total cost for timbering decreased $51,728.80 in 1946. This was due mainly to the fact that the mine was idle during the strike. Some saving on total timber used was affected by increased sub level caving operations. The cost per ton for timbering increased $.014 over 1945 which was relatively small considering the increased labor costs and increased costs of timber supplies. The cost per foot for cribbing and stull timber increased almost 13% in 1946 and the cost per foot of lagging and poles increased about 5½%. The feet of timber used per ton of ore in 1946 was .4705 feet as compared to .6536 feet in 1945 and .8158 feet in 1944. This saving is largely the result of increased use of the sub level caving system of mining.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

7. UNDERGROUND: (CONT'D)
d. Timbering: (Cont'd)

A normal amount of raise repair work was necessary during the year in order to keep connections to mining areas open. Considerable main level repairs were necessary during the year especially on 4th level where increased weight is evident in the southeast cross cut. Timber repair work fell behind during the strike when there was not enough labor available to carry on this work. The most important work was done by the supervisors who were unable to keep up with the necessary repairs. Following the strike period it was necessary to organize additional repair crews and concentrate on this work until it was caught up late in the year.

TIMBER STATEMENT FOR THE YEAR ENDING DECEMBER 31ST 1946

| KIND | LINEAL FEET | AVG. PRICE PER FOOT | AMOUNT 1946 | AMOUNT 1945 |
|---|---|---|---|---|
| 6" to 8" Cribbing | 61,724 | .0669 | 4,128.66 | 7,651.39 |
| 8" to 10" Stulls | 18,587 | .0864 | 1,605.06 | 287.55 |
| 10" to 12" Stulls | 65,248 | .1498 | 9,775.73 | 13,206.73 |
| 12" to 14" Stulls | 23,530 | .2252 | 5,299.56 | 7,901.19 |
| 14" to 16" Stulls | 3,751 | .2501 | 938.06 | 1,801.55 |
| Treated Timber | | | | 1,078.05 |
| Total 1946 | 172,840 | .1258 | 21,747.07 | |
| Total 1945 | 286,552 | .1114 | | 31,926.46 |
| | | Per 100' | | |
| 7' Lagging | 950,041 | 1.4194 | 13,484.67 | 17,557.36 |
| 9½' Poles | 794,544 | 2.3195 | 18,429.62 | 23,256.00 |
| Total 1946 | 1,744,585 | 1.8299 | 31,914.29 | |
| Total 1945 | 2,355,245 | 1.7329 | | 40,813.36 |
| Wire Netting | 1,155 | | 73.29 | 104.40 |

| | 1946 | 1945 |
|---|---|---|
| PRODUCT FOR YEAR | 367,361 | 438,427 |
| Ft. Timber Per Ton of Ore | .4705 | .6536 |
| Ft. Lagging Per Ton of Ore | 2.5861 | 2.8909 |
| Ft. Poles per Ton of Ore | 2.1628 | 2.4811 |
| Ft. Lagging Per Ft. of Timber | 5.4967 | 4.423 |
| Cost per Ton for Timber | .0592 | .0728 |
| Cost per Ton for Lagging | .0367 | .0401 |
| Cost per Ton for Poles | .0502 | .0530 |
| Cost per Ton for Wire Netting | .0002 | .0002 |
| Cost per Ton for Timber, Lagging, Poles & Netting | .1463 | .1661 |
| Equivalent of Stull Timber to Board Measure | 307,480 | 477,510 |
| Ft. of Board Measure per Ton of Ore | .8370 | 1.0891 |
| Lin. Ft. of Netting per Ton of Ore | .0031 | .0038 |
| Sq. Ft. of Netting per Ton of Ore | .0131 | .0157 |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

7. UNDERGROUND: (CONT'D)

d. Timbering: (Cont'd)

Timber Statement for the Year: (Cont'd)

| | | AMOUNT | COST PER TON |
|---|---|---|---|
| Total Cost of Timber, Lagging, Poles, Etc. for year | 1946 | 53,734.65 | .1463 |
| do | 1945 | 72,844.22 | .1661 |
| do | 1944 | 77,935.27 | .1850 |
| do | 1943 | 82,305.17 | .1589 |
| do | 1942 | 82,410.65 | .1209 |
| do | 1941 | 67,589.93 | .1041 |
| do | 1940 | 59,589.66 | .1155 |
| do | 1939 | 47,153.55 | .1164 |
| do | 1938 | 35,920.27 | .1340 |
| do | 1937 | 49,763.66 | .1123 |
| do | 1936 | 35,719.77 | .1149 |

e. Drifting And Raising

The following table gives a comparison of total feet of drifting and raising in ore and rock in 1946 and 1945.

| Year | Drifting Ore | Drifting Rock | Raising Ore | Raising Rock | Grand Total |
|---|---|---|---|---|---|
| 1946 | 395 | 616 | 571 | 127 | 1,709 |
| 1945 | 3,796 | 214 | 1,220 | 438 | 5,668 |
| Increase | | 402 | | | |
| Decrease | 3,401 | | 649 | 311 | 3,959 |

The large decrease in ore development is due to the fact that footage for sub level caving and other work on sub levels in connection with mining operations was included under the heading "Stoping" instead of "Development" as was the case last year. The only footages included under "Development" were main level drifting and raises from main levels as well as all rock work whether on main levels or not.

f. Explosives, Drilling and Blasting

The type of explosives used for mining was changed during the year. Gelamite No. 1 had been standard for several years but now a new product namely No. 2X Hercomite powder was introduced. This powder is slightly bulkier and has a dry appearance compared to Gelamite No. 1. Some saving was effected in using this new powder in that it has greater strength per unit of weight than Gelamite No. 1. Some Gelamite No. 1 will still be used however as it is more desirable for raising because the powder is sticky and will not run out of the carton while it is being tamped into the drill hole.

There was no change in drilling methods during the year with Ingersoll Rand RB 12 Jackhammers and Jack Legs being used.

Some difficulty was experienced during the year with electric blasting from 250V Direct Current. Apparently the voltage is too high causing the cap to misfire. This condition was improved by installing a circuit of 220 V alternating current to be used for electric blasting only. Fuse blasting was continued in mining contracts with one minor change in that the length of regular fuses were increased from 7' to 8' for safety purposes and also to allow the miner to cut off longer lengths from the end in order to time the holes a little better.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

7. UNDERGROUND: (CONT'D)

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

STATEMENT OF EXPLOSIVES USED DURING YEAR 1946
ORE DEVELOPMENT & STOPING

| KIND | | QUANTITY | AVERAGE PRICE | AMOUNT 1946 | Amount 1945 |
|---|---|---|---|---|---|
| 60% Am. Gelatin Powder | lbs. | 1,295 | 11.50 | 148.92 | 42.55 |
| No. 1 Gelamite Powder | | 31,115 | 11.50 | 3,578.22 | 19,205.11 |
| No. 2X Hercomite Powder | | 100,699 | 12.53 | 12,615.46 | |
| Total Powder 1946 | | 133,109 | 12.28 | 16,342.60 | |
| Total Powder 1945 | | 167,371 | 11.50 | | 19,247.66 |
| Fuse | Ft. | 547,890 | 5.61 | 3,074.29 | 3,316.72 |
| Caps | Ea. | 68,565 | 13.14 | 900.85 | 1,061.05 |
| Electric Caps & Delays | | 935 | 12.74 | 119.11 | 141.42 |
| Tamping Bags | M | 20,000 | 2.15 | 43.00 | 86.00 |
| Fuse Lighters | | 15,000 | 6.75 | 101.28 | 101.28 |
| Connecting Wire | Lbs. | 62 | .55 | 34.10 | 31.90 |
| Shot Firing Cord | Ft. | 500 | 17.46 | 8.73 | |
| Total Fuse, Caps, Etc. | | | | 4,281.36 | 4,738.37 |
| TOTAL ALL EXPLOSIVES | | | | 20,623.96 | 23,986.03 |
| PRODUCT | | | | 367,361 | 438,427 |
| Pounds Powder per Ton of Ore | | | | .3623 | .3818 |
| Tons of Ore per Lb. of Powder | | | | 2.7599 | 2.6195 |
| Cost per Ton for Powder | | | | .0445 | .0439 |
| Cost Per Ton for Fuse, Caps, Etc. | | | | ..0116 | .0108 |
| Cost per Ton for all Explosives | | | | .0561 | .0547 |

SINKING, ROCK DEVELOPMENT, ETC.

| KIND | | QUANTITY | AVERAGE PRICE | AMOUNT 1946 | AMOUNT 1945 |
|---|---|---|---|---|---|
| 60% Am. Gelatin Powder | lbs. | 2,005 | 11.87 | 238.08 | 227.70 |
| No. 1 Gelamite Powder | | 860 | 11.50 | 98.90 | 201.14 |
| No. 2X Hercomite Powder | | 3,501 | 12.68 | 444.04 | |
| Herculite | | | | | 15.00 |
| Total Powder 1946 | | 6,366 | 12.27 | 781.02 | |
| Total Powder 1945 | | 3,876 | 11.44 | | 443.84 |
| Fuse | Ft. | 25,110 | 5.46 | 137.12 | 77.57 |
| Caps | Ea. | 3,435 | 12.97 | 44.55 | 24.75 |
| Electric Caps & Delays | | 249 | 13.69 | 34.09 | 132.27 |
| Shot Firing Cord | Ft. | 500 | 17.46 | 8.73 | 8.73 |
| Total Fuse, Caps, Etc. | | | | 224.49 | 243.32 |
| TOTAL ALL EXPLOSIVES | | | | 1,005.51 | 687.16 |
| TOTAL EXPLOSIVES USED AT MINE | | | | 21,629.47 | 24,673.19 |
| AVG. PRICE PER POUND FOR POWDER | | | | .1228 | .1150 |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

7. UNDERGROUND: (CONT'D)

g. Mining And Loading

Sub level caving operations were increased in 1946. By December there were 14 contracts sub caving or developing for sub caving and 9 contracts top slicing. The efficiency was improved somewhat over 1945 and a considerable saving in timber consumption was realized. It was found by experience that this system of mining does not work to satisfaction in all areas of the mine. In some places however it worked very well and will be continued.

Tramming costs increased in 1946 due to increased labor costs and also to the fact that tramming is now being done on 5 levels. In 1945 most of the production was trammed on 4th and 8th levels. In the future it will be necessary to keep 4 or 5 levels in operation as there is no single ore area which is large enough to maintain the required production.

h. Ventilation

Ventilation has been good during the year with approximately 75,000 cubic feet per minute of air being delivered from the main fan which is located on the tenth level. Regular ventilation surveys were made by the safety department together with the field engineer of Saranac Laboratory of New York. Their main criticism was that too much air is being recirculated. Efforts are being made to correct this condition but it is difficult to overcome it entirely because of the fact that the main shaft i used for both intake and exhaust air. The cage compartment is downcast and the skip compartment is upcast. Ventilation costs were less in 1946 due to less labor costs in developing permanent airways. Considerable work was done in 1945 which will be permanent. Some additional permanent raises will be needed between 8th and 9th levels but mining raises will serve as ventilation connections until a later time when the permanent rock raises can be put in.

i. Pumping

The following table gives data on pumping at the Athens and Breitung Shafts:

| Period | Avg. K.W. Per Day - Athens | K.W. Per Month Breitung Pump | Avg. Gal. Per Min. - Athens | Total Cost Both Mines From Athens Cost Sheet |
|---|---|---|---|---|
| January | 3,607 | 2,470 | 303 | $ 2,251.78 |
| February | 3,630 | 570 | 331 | 2,038.93 |
| March | 3,477 | 2,020 | 282 | 2,308.11 |
| April | 3,651 | 3,880 | 327 | 2,506.53 |
| May | 4,620 | 4,000 | 366 | 3,083.81 |
| June | 3,920 | 2,630 | 330 | 2,337.54 |
| July | 3,848 | 1,990 | 321 | 2,375.18 |
| August | 3,713 | 1,740 | 314 | 2,214.05 |
| September | 3,728 | 2,385 | 316 | 2,218.23 |
| October | 3,797 | 126 | 316 | 3,452.89 |
| November | 3,880 | 112 | 304 | 2,617.33 |
| Dedember | 3,516 | 141 | 302 | 2,068.63 |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

7. UNDERGROUND: (CONT'D)
i. Pumping: (Cont'd)

The following table gives data on pumping at the Athens and Breitung Shafts: (Cont'd).

| Period | Avg. K.W. Per Mo. Day - Athens | K.W. Per Month Breitung Pump | Avg. Gal. Per Min. - Athens | Total Cost Both Mines From Athens Cost Sheet |
|---|---|---|---|---|
| 1938 Avg. | 3,767 | 3,433 | 314 | $ 2,350.42 |
| 1939 " | 3,991 | 4,391 | 331 | 2,291.90 |
| 1940 " | 4,141 | 858 | 351 | 2,381.69 |
| 1941 " | 4,008 | 1,883 | 354 | 2,351.56 |
| 1942 " | 4,435 | 2,258 | 388 | 2,668.91 |
| 1943 " | 4,351 | 3,358 | 372 | 2,701.08 |
| 1944 " | 3,696 | 1,688 | 308 | 2,528.62 |
| 1945 " | 3,951 | 2,853 | 332 | 2,356.83 |
| 1946 " | 3,909 | 1,839 | 320 | 2,456.08 |

| | |
|---|---|
| Average cost in 1934 prior to pumping at the Breitung | 2,611.79 |
| Saving in 1935 when expense was heavy account of installing | $ 2,600.59 |
| Saving in 1936 | 10,148.52 |
| Saving in 1937 | 10,352.04 |
| Saving in 1938 | 3,135.96 |
| Saving in 1939 | 3,838.65 |
| Saving in 1940 | 2,761.20 |
| Saving in 1941 | 2,922.76 |
| Saving in 1942 | 685.44* |
| Saving in 1943 | 1,071.50* |
| Saving in 1944 | 83.17 |
| Saving in 1945 | 3,059.52 |
| Saving in 1946 | 155.71 |

(*) Above the cost, prior to pumping at the Breitung.

The Number of gallons pumped per minute at the Athens Mine in each month of the year for the past seven years is given in the following statement:

| Month | 1946 | 1945 | 1944 | 1943 | 1942 | 1941 | 1940 | 1939 |
|---|---|---|---|---|---|---|---|---|
| January | 303 | 306 | 315 | 359 | 399 | 330 | 325 | 297 |
| February | 331 | 302 | 297 | 334 | 388 | 327 | 318 | 282 |
| March | 282 | 293 | 296 | 330 | 373 | 324 | 322 | 297 |
| April | 327 | 342 | 295 | 356 | 374 | 334 | 318 | 293 |
| May | 366 | 365 | 307 | 404 | 402 | 334 | 340 | 338 |
| June | 330 | 359 | 312 | 411 | 402 | 367 | 380 | 357 |
| July | 321 | 359 | 314 | 431 | 393 | 386 | 421 | 382 |
| August | 314 | 355 | 313 | 419 | 394 | 363 | 350 | 375 |
| September | 316 | 338 | 311 | 390 | 384 | 363 | 369 | 360 |
| October | 316 | 329 | 312 | 364 | 397 | 360 | 373 | 348 |
| November | 304 | 325 | 316 | 337 | 379 | 365 | 343 | 334 |
| December | 302 | 307 | 328 | 368 | 397 | 308 | 348 | 329 |
| Average | 320 | 332 | 308 | 372 | 388 | 354 | 351 | 331 |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING:

A. Comparative Mining Costs:

| | 1946 | 1945 | Increase | Decrease |
|---|---|---|---|---|
| PRODUCT | 367,361 | 438,427 | | 71,066 |
| Underground Costs | 2.192 | 2.062 | .130 | |
| Surface Costs | .241 | .254 | | .013 |
| General Mine Expense | .378 | .331 | .047 | |
| Cost of Production | 2.811 | 2.647 | .164 | |
| Depletion - Original Cost | .020 | .021 | | .001 |
| - Increment | .039 | .039 | .000 | |
| Depreciation - Plant & Equipment | .028 | .028 | .000 | |
| - Development | .024 | .034 | | .010 |
| Taxes | .201 | .235 | | .034 |
| Loading & Shipping | .068 | .051 | .017 | |
| Administrative & General Expense | .050 | .050 | .000 | |
| Miscellaneous Income & Expense | .006 | .022 | | .016 |
| Supply Inventory Adjustment | .001 | .000 | .001 | |
| Total Cost at Mine, Before Royalty | 3.248 | 3.127 | .121 | |
| Budget - Estimated Cost per ton | 3.260 | 3.141 | .119 | |
| No. of Days Operated | 218 | 301 | | 83 |
| No. Shifts & Hours | | | | |
| 1 - 8 hours | 3 | 10 | | 7 |
| 2 - 8 hour | 215 | 291 | | 76 |
| Average Daily Product | 1,685 | 1,457 | 228 | |

| | 1946 | | 1945 | |
|---|---|---|---|---|
| COST OF PRODUCTION | Cost Per Ton | Percent | Cost Per Ton | Percent |
| Labor | 2.055 | 73.1 | 1.824 | 68.9 |
| Supplies | .756 | 26.9 | .823 | 31.1 |
| Total | 2.811 | 100 | 2.647 | 100 |
| Increase (labor) | .231 | | | |
| Decrease (supplies) | .067 | | | |
| Total Increase | .164 | | | |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING: (CONT'D)

b. Detailed Cost Comparison:

(1) Days And Shifts

| Year | Days Mine Worked | Shifts & Hours | Men Employed | Total Shifts Worked |
|---|---|---|---|---|
| 1946 | 218 | 6 2-8 Hours ~~249~~ | 249 | 433 |
| 1945 | 301 | 5 2-8 Hours to 1/22<br>6 2-8 hours 1/22 to 12/31/45 | 306 | 592 |
| Decrease | 83 | | 57 | 159 |

(2) Comparison of Production:

| | |
|---|---|
| Production - 1946 | 367,361 tons |
| Production - 1945 | 438,427 tons |
| Decrease | 71,066 tons |

(3) Comparison of Number of Men and Wages:

| | No. Men | No. Days | Amount | Rate Per Day |
|---|---|---|---|---|
| 1946 | 249 | 76,195 | 762,294.02 | 10.01 |
| 1945 | 306 | 90,217 | 763,859.03 | 8.47 |
| Increase | | | | 1.54 |
| Decrease | 57 | 14,022 | 1,565.01 | |

(4) Tons Per Man Per Day:

| | 1946 | 1945 | Increase | Decrease |
|---|---|---|---|---|
| Surface | 25.72 | 22.66 | 3.06 | |
| Underground | 6.24 | 6.19 | .05 | |
| Total | 5.04 | 4.86 | .18 | |

(5) Cost of Production:

| | Total | Cost Per Ton |
|---|---|---|
| 1946 | 1,032,758.37 | 2.811 |
| 1945 | 1,160,486.73 | 2.647 |
| Increase | | .164 |
| Decrease | 127,728.36 | |

| | Labor | Percent | Supplies | Percent |
|---|---|---|---|---|
| 1946 | 775,064.20 | 73.1 | 277,694.17 | 26.9 |
| 1945 | 774,496.39 | 68.2 | 360,790.58 | 31.8 |
| Increase | 567.81 | 4.9 | | |
| Decrease | | | 83,096.41 | 4.9 |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING: (CONT'D)

b. Detailed Cost Comparison: (Cont'd)
(7) Detail of Accounts:

| | | 1946 | | 1945 | |
|---|---|---|---|---|---|
| | UNDERGROUND COSTS: | AMOUNT | PER TON | AMOUNT | PER TON |
| 1. | Exploring in Mine | 336.90 | .001 | 10,703.70 | .024 |
| 2. | Sinking in Shaft | | | | |
| 3. | Development in Rock | 11,947.50 | .032 | 11,326.98 | .026 |
| 4. | Development in Ore | 9,547.66 | .026 | 42,487.59 | .097 |
| 5. | Stoping | 225,822.97 | .615 | 215,889.82 | .492 |
| 6. | Timbering | 298,692.72 | .813 | 350,421.52 | .799 |
| 7. | Tramming | 102,823.69 | .280 | 95,007.04 | .217 |
| 8. | Ventilation | 13,054.68 | .036 | 18,870.53 | .043 |
| 9. | Pumping | 20,967.38 | .057 | 28,281.91 | .065 |
| 10. | Compressors and Air Pipes | 36,610.78 | .100 | 43,990.75 | .100 |
| 11. | Fire and Damage | | | 70.70 | .000 |
| 12. | Underground Superintendence | 32,144.69 | .087 | 37,071.05 | .085 |
| 13. | Cave-In | | | | |
| 14. | Maint: Compressors and Power Drills | 2,532.74 | .007 | 3,192.65 | .007 |
| 15. | Scrapers and Mech. Loaders | 28,004.31 | .076 | 24,631.48 | .056 |
| 16. | Electric Tram Equipment | 19,224.83 | .052 | 19,771.22 | .045 |
| 17. | Pumping Machinery | 3,721.66 | .010 | 2,398.42 | .005 |
| | Total Underground Costs | 805,432.51 | 2.192 | 904,115.36 | 2.062 |
| | SURFACE COSTS: | | | | |
| 18. | Hoisting | 32,544.53 | .089 | 39,206.92 | .089 |
| 19. | Stocking Ore | 6,528.12 | .018 | 8,239.46 | .019 |
| 20. | Screening - Crushing at Mine | | | | |
| 21. | Dry House | 11,930.12 | .032 | 14,862.15 | .034 |
| | General Surface Expense | 9,334.81 | .025 | 11,257.81 | .026 |
| 23. | Maint: Hoisting Equipment | 13,112.14 | .036 | 14,181.83 | .032 |
| 24. | Shaft | 5,492.77 | .015 | 8,640.15 | .020 |
| 25. | Top Tram Equipment | 915.10 | .002 | 2,193.89 | .005 |
| 26. | Docks, Trestles and Pockets | 2,076.09 | .006 | 2,948.25 | .007 |
| 27. | Mine Buildings | 6,682.58 | .018 | 9,684.50 | .022 |
| | Total Surface Costs | 88,616.26. | .241 | 111,214.96 | .254 |
| | GENERAL MINE EXPENSE: | | | | |
| 28. | Mining Engineering | 4,559.74 | .012 | 4,125.56 | .009 |
| 29. | Mech. and Electrical Engineering | 1,513.53 | .004 | 2,240.76 | .005 |
| 30. | Analysis and Grading | 11,652.51 | .032 | 15,721.61 | .036 |
| 31. | Safety Department | 2,370.53 | .007 | 2,193.47 | .005 |
| 32. | Telephones and Safety Devices | 2,614.71 | .007 | 2,554.19 | .006 |
| 33. | Local and General Welfare | 3,044.96 | .008 | 3,930.63 | .009 |
| 34. | Special Expense, Pensions & Allow. | 6,145.07 | .017 | 7,840.88 | .018 |
| 35. | Ishpeming Office | 18,918.02 | .052 | 19,721.94 | .045 |
| 36. | Mine Office | 18,023.56 | .049 | 19,484.61 | .044 |
| 37. | Insurance | 3,957.66 | .011 | 5,092.82 | .012 |
| 38. | Personal Injury | 22,822.68 | .062 | 12,574.76 | .029 |
| 39. | Social Security Taxes | 15,492.55 | .042 | 18,229.79 | .041 |
| 40. | Employees Vacation Pay | 27,594.08 | .075 | 31,445.39 | .072 |
| | Total General Mine Expenses | 138,709.60 | .378 | 145,156.41 | .331 |
| | COST OF PRODUCTION | 1,032,758.37 | 2.811 | 1,160,486.73 | 2.647 |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING: (CON'T)

IDLE EXPENSE - STRIKE PERIOD
February 8th To May 22nd.1946

| | | AMOUNT |
|---|---|---|
| UNDERGROUND COSTS: | | |
| Exploring in Mine | | 155.79 |
| Stoping | | 789.18 |
| Timbering | | 3,949.28 |
| Tramming | | 314.91 |
| Ventilation | | 2,566.59 |
| Pumping | | 8,505.63 |
| Compressors and Air Pipes | | 2,491.97 |
| Underground Superintendence | | 10,209.37 |
| Maintenance: | Compressors and Power Drills | 161.87 |
| | Scrapers and Mechanical Loaders | 572.68 |
| | Electric Tram Equipment | 300.50 |
| | Pumping Machinery | 489.42 |
| Total Underground Costs | | 30,507.19 |
| SURFACE COSTS: | | |
| Hoisting | | 1,733.58 |
| Stocking Ore | | 157.59 |
| Dry House | | 3,514.25 |
| General Surface Expense | | 2,983.67 |
| Maintenance: | Hoisting Equipment | 364.26 |
| | Shaft | 14.77 |
| | Top Tram Equipment | 37.43 |
| | Docks, Trestles and Pockets | 9.11 |
| | Mine Buildings | 38.34 |
| Total Surface Costs | | 8,853.00 |
| GENERAL MINE EXPENSES: | | |
| Mining Engineering | | 1,096.69 |
| Mechanical and Electrical Engineering | | 594.70 |
| Analysis and Grading | | 1,392.85 |
| Safety Department | | 596.04 |
| Telephones and Safety Devices | | 79.20 |
| Local and General Welfare | | 1,038.00 |
| Special Expense, Pensions and Allowances | | 1,788.89 |
| Ishpeming Office | | 5,611.00 |
| Mine Office | | 5,072.00 |
| Insurance | | 1,144.23 |
| Personal Injury | | 2,567.04 |
| Social Security Taxes | | 2,018.34 |
| Employees Vacation Pay | | 7,175.00 |
| Group Annuity Premiums | | 402.15 |
| Total General Mine Expenses | | 30,576.13 |
| COST OF PRODUCTION | | 69,936.32 |
| DEPLETION, DEPRECIATION & TAXES: | | |
| Taxes | | 28,675.00 |
| Total Depletion, Depreciation & Taxes | | 28,675.00 |
| TOTAL IDLE EXPENSE | | 98,611.32 |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING: (CONT'D)

b. Detailed Cost Comparison: (Cont'd)
(7) Detail Of Accounts: (Cont'd)

1. Exploring in Mine:

Covers a proportion of Geological Department expense and diamond drill explorations. There was no diamond drilling expense in 1946. In 1945 there were 1,600 feet of drilling on 8th level to determine the trough of iron formation lying to the north of the east-west diabase dike. The decrease in cost for 1946 was $10,366.80 and cost per ton $.023.

3. Development in Rock:

Total feet of drifting and raising in rock, 743 feet in 1946 as compared with 652 feet in 1945. Increase in expense $620.52 and in cost per ton $.006. Drifting in 1946, 616 feet; in 1945, 214 feet. Raising in 1946, 127 feet; in 1945, 438 feet.

4. Development in Ore:

The decrease in expense was $32,939.93 and in cost per ton $.071. There were 3,401 feet less drifting and 649 feet less raising in 1946.

5. Stoping:

There was an increase in expense of $9,933.15 and in cost per ton $.123.

6. Timbering:

The decrease in expense was $51,728.80 while the cost per ton increased $.014. The cost for timber, lagging, and poles decreased $.0198 per ton. There were five second hand H.V. Utility air hoists purchased from Princeton Mine in 1946, costing $200.00 each while in 1945 there were four new H.V. Utility air hoists purchased costing $475.00 each.

7. Tramming:

There was a decrease of 71,066 tons in production. The expense to this account increased $7,816.65 and cost per ton $.063.

8. Ventilation:

The expense to this account decreased $5,815.85 and cost per ton $.007. The decrease in expense was due to concreting a ventilation raise in 1945 and $974.94 less for electric power in 1946.

9. Pumping:

Expense decreases $7,314.53 and cost per ton $.008.

| | |
|---|---|
| Gallons of water pumped in 1946 - | 168,139,933 |
| Gallons of water pumped in 1945 - | 174,073,654 |
| Gallons decrease | 5,983,621 |
| Average gallons per minute in 1946 | 320 |
| Average gallons per minute in 1945 | 332 |
| Gallons Decrease per minute | 12 |

The cost for electric power was $616.81 less than in 1945.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING: (CONT'D)
b. Detailed Cost Comparison: (Cont'd)
(7) Detail of Accounts: (Cont'd)

10. Compressors and Air Pipes:

Expenditures decreased $7,379.97 and cost per ton remained the same.

| | |
|---|---|
| Cubic feet air compressed in 1946 - | 817,695,000 |
| Cubic feet air compressed in 1945 - | 873,710,000 |
| Decrease Cubic feet of air | 56,015,000 |

| | |
|---|---|
| Cost of electric power in 1946 - | $ 23,960.35 |
| Cost of electric power in 1945 - | 28,757.13 |
| Decrease of electric power | 4,796.78 |

11. Fire and damage:

There were no charges to this account in 1946. In 1945 the charge was $70.70.

12. Underground Superintendence:

The increase in expense was $4,926.36 and the cost per ton decreased $.002. The increase in expense was due to one more underground foreman being put on in July 1946 and the increase in salaries.

13. Cave-In:

There was no expense to this account in 1947 or 1946.

14. Compressors and Power Drills:

The increase in expense was $659.91 while the cost per ton remained the same. There were three new RB-12 Jackhammer drills purchased in 1946 costing $224.00 each and four Ingersoll-Rand Pick Hammer drill machines bought from Princeton Mine second hand, costing $100.00 each. In 1945 four RB-12 Jackhammer drill machines were purchased costing #200.00 each. A new water circulating pump and front head for compressor was bought in 1946.

15. Scrapers and Mechanical Loaders:

The expense in 1946 increased $3,372.83 and cost per ton $.020. There were two new 25 H.P. Ingersoll-Rand electric scraper hoists costing $2,116.00 each and two second hand 15 H.P. hoists purchased in 1946 as compared with no hoists purchased in 1945. The repairs to scraper hoists increased due to mine being idle during strike when some of the hoists were buried in places which broke down and on others the motors became damp.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING: (CONT'D)
b. Detailed Cost Comparison: (Cont'd)
(7) Detail Of Accounts: (Cont'd)

16. Electric Tram Equipment:

The decrease in expense was $546.39 and cost per ton increased $.007.

| | Generators | Locomotives | Wiring | M.L. Track | M.L. Cars |
|---|---|---|---|---|---|
| 1946 | 1,088.14 | 5,147.12 | 645.08 | 8,202.50 | 4,141.99 |
| 1945 | 87.24 | 5,566.45 | 562.53 | 9,864.81 | 3,690.19 |
| Increase | 1,000.90 | | 82.55 | | 451.80 |
| Decrease | | 419.33 | | 1,662.31 | |

The increase in expense to generators was due to repairing one of the generators which burnt out. There was also more repairs to trolley lines and main line cars. The decrease in expense to locomotives and main line tracks was due to less repairs.

17. Pumping Machinery:

Expenditures increased $1,323.18 and cost per ton $.005. The increase was due to more repairs to electric pumps and purchasing a new sludge pump costing $180.00 for cleaning pump sumps.

SURFACE COSTS:

18. Hoisting:

| | Ore | Rock | Total |
|---|---|---|---|
| Product 1946 - Tons | 367,361 | 12,965 | 380,326 |
| Product 1945 - Tons | 438,427 | 12,365 | 450,792 |
| Increase | | 600 | |
| Decrease | 71,066 | | 70,466 |

There was a decrease in expense of $6,662.39 while the cost per ton remained the same. The electric power charge was $3,861.79 less than in 1945.

19. Stocking Ore:

| | |
|---|---|
| Tons stocked in 1946 - | 127,492 |
| Tons stocked in 1945 - | 150,485 |
| Decrease | 22,993 |

The decrease in expense was $1,711.34 and in cost per ton $.001

21. Dry House Expense:

There was a decrease in expense of $2,932.03 and cost per ton $.002.

A stoker was installed in the heating plant the last part of August which made it possible to take off one man. Three men now take care of the heating plant and clean the dry house.

ATHENS MINE
ANNUAL REPORT
YEAR 1946

8. COST OF OPERATING: (CONT'D)
b. Detailed Cost Comparison: (Cont'd)
(7) Detail of Accounts: (Cont'd)

22. General Surface Expense:

Expense to this account decreased $1,923.00 and cost per ton $.001.

The decrease in expense was due to the policemen's time and part of the surface foreman's time being charged to idle expense during the strike.

23. Hoisting Equipment:

| | Electric Hoists | Hoisting Ropes | Skips and Skip Roads | Sheaves |
|---|---|---|---|---|
| 1946 | 2,955.56 | 4,526.18 | 5,249.01 | 381.39 |
| 1945 | 3,374.13 | 2,831.21 | 5,974.56 | 2,001.93 |
| Increase | | 1,694.97 | | |
| Decrease | 418.57 | | 725.55 | 1,620.54 |

The decrease in expense was $1,069.69 and cost per ton increased $.004.

In 1946 two 1-3/8" skip ropes costing $2,843.29 and one 1-1/4" cage rope costing $1,682.89 were charged out as compared with two 1-3/8" skip ropes costing $2,831.21 in 1945. The decrease in expense for sheaves was due to replacing two old type 8 ft. bicycle sheaves with a new type in 1945. The decrease in Electric Hoists and Skips and Skips Roads was due to less repairs.

24. Shaft:

There was a decrease in expense of $3,147.38 and cost per ton $.005.

| | Steel Sets | U. G. Pockets |
|---|---|---|
| 1946 | 1,901.08 | 3,591.69 |
| 1945 | 2,381.95 | 6,258.20 |
| Increase | | |
| Decrease | 480.87 | 2,666.51 |

There were less repairs to steel sets and underground pockets.

25. Top Tram Equipment:

There was a decrease in expense of $1,278.79 and cost per ton $.003.

| | Engines & Motors | Wire Rope | Sheaves Rollers, Etc. | Tracks & Cars |
|---|---|---|---|---|
| 1946 | 81.64 | 110.83 | 133.79 | 588.84 |
| 1945 | 122.20 | None | 547.26 | 1,524.43 |
| Increase | | 110.83 | | |
| Decrease | 40.56 | | 413.47 | 935.59 |

127,492 tons were stocked as compared with 150,485 tons in 1945.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING: (CONT'D)
B. Detailed Cost Comparison: (Cont'd)
(7) Detail of Accounts: (Cont'd)

26. Docks, Trestles, and Pockets:

The decrease in expenditures was $872.16 and cost per ton $.001.

There was no wood trestles erected in 1946 or 1945. The decrease in expense was due to less repairs to steel trestles and rock trestle.

27. Mine Buildings:

Expenditures decreased $3,001.92 and cost per ton $.004.

The detail of expense is as follows:

| | | |
|---|---|---|
| Office | 25.04 | Repairing windows, steps and plumbing. |
| Shops | 5.15 | Repairs to doors and window lights. |
| Shaft House | 5,142.24 | Includes charges of $4,759.81 transferred from E & A-AM-15 for replacing corroded structual steel members in shaft house. The balance of expense was for repairs to skip dump and ore pockets. |
| Engine House | 109.99 | Repairs to windows and interior painting. |
| Heating Plant | 47.03 | Roof repairs and door to coal bin. |
| Dry House | 136.77 | Interior painting and repairs to water lines. |
| Coal Dock | 528.86 | Alterations and enclosing part of coal dock for stoker coal. |
| Timber Tunnel | 72.47 | Repairing doors and sheet metal covering. |
| Top Tram Building | 230.78 | Remodeling controller house. |
| Storage Building | 46.93 | Repairing roof and windows. |
| Puffer House | 337.32 | Building house for puffer used when changing skip. |
| Total | 6,682.58 | |

GENERAL MINE EXPENSE:

28. Mining Engineering:

The increase in expense was $434.18 and cost per ton $.003.

Covers time and expense of mining engineers and helpers.

29. Mechanical and Electrical Engineering:

There was a decrease in expense of $727.23 and cost per ton $.001

The charge to this account covers the time spent by mechanic and electrical departments men on inspections and repairs.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING: (CONT'D)
b. Detailed Cost Comparison: (Cont'd)
(7) Detail of Accounts: (Cont'd)

30. Analysis and Grading

| | Sampling At Mine | Central Laboratory Exp | Shipping Dept. Exp. | Trucking Samples, Etc. |
|---|---|---|---|---|
| 1946 | 2,966.22 | 5,569.40 | 2,512.08 | 604.81 |
| 1945 | 2,470.73 | 9,653.51 | 2,854.67 | 742.70 |
| Increase | 495.49 | | | |
| Decrease | | 4,084.11 | 342.59 | 137.89 |

Determinations 1946 - 35,114 Cost per determination $.158609
Determinations 1945 - 71,434 Cost per determination $.135139

There was a decrease in expenditures of $4,069.10 and cost per ton $.004.

31. Safety Department:

| | First Aid Supplies | First Aid And Helmet Practice | Ishpeming Office Charge |
|---|---|---|---|
| 1946 | 338.53 | 173.16 | 1,858.84 |
| 1945 | 164.78 | 94.96 | 1,933.73 |
| Increase | 173.75 | 78.20 | |
| Decrease | | | 74.89 |

The expense to this account increased $177.06 and cost per ton $.002.

32. Telephones and Safety Devices:

There was an increase in expense of $60.52 and cost per ton $.001.

| | 1946 | 1945 | Inc. | Dec. |
|---|---|---|---|---|
| Lights at Shaft & Levels | 1,388.61 | 1,533.84 | | 145.23 |
| Mine Telephone | 239.78 | 160.12 | 79.66 | |
| Safety Gates | 744.33 | 687.21 | 57.12 | |
| Sign Boards & Signals | 25.69 | 85.03 | | 59.34 |
| Fire Equipment | 216.30 | 87.99 | 128.31 | |

33. Local and General Welfare:

The expense to this account decreased $885.67 and cost per ton $.001.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING: (CONT'D)
b. Detailed Cost Comparison: (Cont'd)
(7) Detail of Accounts (Cont'd)

34. Special Expense, Pensions and Allowances:

| | Legal | Examinations | Retirement | Wage Adjustment | Other Expense | Pensions & Allowances |
|---|---|---|---|---|---|---|
| 1946 | 1,322.82 | 338.30 | 2,888.99 | | 1,015.74 | 579.22 |
| 1945 | 401.04 | 1,901.73 | 3,089.83 | | 1,483.20 | 965.08 |
| Inc. | 921.78 | | | | | |
| Dec. | | 1,563.43 | 200.84 | | 467.46 | 385.86 |

There was a decrease in expenditures of $1,695.81 and cost per ton $.001.

35. Ishpeming Office:

Ishpeming Office expense is pro-rated to the various mines on the basis of labor costs.

There was a decrease in expense of $803.92 while the cost per ton increased $.007.

36. Mine Office:

| | Salaries | Central Warehouse Expense | Miscellaneous |
|---|---|---|---|
| 1946 | 12,818.00 | 3,936.75 | 1,268.81 |
| 1945 | 14,208.62 | 4,093.78 | 1,182.21 |
| Increase | | | 86.60 |
| Decrease | 1,390.62 | 157.03 | |

The decrease in expense was $1,461.05 and cost per ton increased $.005.

37. Insurance:

| | Property | Group | Catastrophe | Group Annuity |
|---|---|---|---|---|
| 1946 | 1,043.12 | 1,813.27 | 412.37 | 688.90 |
| 1945 | 1,329.59 | 1,969.82 | 537.58 | 1,255.83 |
| Decrease | 286.47 | 156.55 | 125.21 | 566.93 |

There was decrease in expense of $1,135.16 and cost per ton $.001.

39. Social Security Taxes:

| | Unemployment Insurance Tax | Old Age Benefit Tax |
|---|---|---|
| 1946 | 8,756.75 | 6,735.80 |
| 1945 | 10,303.77 | 7,926.02 |
| Decrease | 1,547.02 | 1,190.22 |

There was a decrease in expenditures of $2,737.24 and an increase in cost per ton of $.001

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

8. COST OF OPERATING: (CONT'D)

b. Detailed Cost Comparison: (Cont'd)

(7) Detail Of Accounts: (Cont'd)

40. Employees Vacation Pay:

The decrease in expense was $3,851.31 while the cost per ton increased $.003.

9. EXPLORATIONS AND FUTURE EXPLORATIONS:

There was no diamond drilling on surface or underground in 1946. In 1945 ore was located by underground diamond drilling north of the large east-west diorite dike. It is planned that in 1947 further explorations and development of this ore body will be carried on by drifting directly into it. The first drift will be put in on 9th level and raises will be put up to the 8th level elevation.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

10. TAXES:

COMPARATIVE STATEMENT OF TAXES FOR THE YEARS 1946 AND 1945

| DESCRIPTION | 1946 | | 1945 | |
|---|---|---|---|---|
| CITY OF NEGAUNEE | VALUATION | TAXES | VALUATION | TAXES |
| Realty (Tax Commission | 1,990,000 | 87,845.17 | 2,095,000 | 88,383.65 |
| Stockpile, Supplies and Equipment | 305,000 | 13,463.71 | 320,000 | 13,500.13 |
| Total by Tax Commission | 2,295,000 | 101,308,88 | 2,415,000 | 101,883.78 |
| Collection fees | | 1,013.09 | | 1,018.84 |
| Total Operating Athens Mine | | 102,321.97 | | 102,902.62 |
| HARVEY ADDITION | | | | |
| Lot 1, Portion of | 950 | 41.94 | 950 | 40.08 |
| Lot 2, Portion of | 190 | 8.39 | 190 | 8.02 |
| Lot 2, Portion of Liber 24-609-Gayette | 950 | 41.94 | | |
| Lots 5, 6, Portion of (Cedarblade) .33 acres | 760 | 33.55 | 760 | 32.06 |
| Lot 6, Portion of .36 acres | 855 | 37.74 | 855 | 36.07 |
| Lot 7, Portion of (Lehman) Liber-20-82 | 475 | 20.97 | 475 | 20.04 |
| Lot 7, Portion of Liber 20-81 | 475 | 20.97 | 475 | 20.04 |
| Lot 7, Portion of Liber 30-213 | 665 | 29.36 | 665 | 28.05 |
| Appros. .5 acres in Sec. 6, 47-26 (Primeau) | | | 475 | 20.04 |
| Lot 8, Portion of Liber 19-72 Blair | 475 | 20.97 | | |
| STERLING ADDITION | | | | |
| Lot 1 & W. 13' Lot 2, & W 6½' of Lot 3 | 190 | 8.39 | 190 | 8.02 |
| Lot 7,(Vassanen) | 1,330 | 58.71 | 1,330 | 56.11 |
| Lots 8, 9 (Bjornberg) | 1,140 | 50.32 | 1,140 | 48.09 |
| Lot 10 (Delarye) | 855 | 37.74 | 855 | 36.07 |
| Lots 11, (2 Houses) | 1,140 | 50.32 | 1,140 | 48.09 |
| Lots 12, 13 | 2,185 | 96.45 | 2,185 | 92.18 |
| Lot 14 (Wisk) | 1,045 | 46.13 | 1,045 | 44.10 |
| Lot 15 (Johnson) | 1,425 | 62.90 | 1,425 | 60.12 |
| Lot 16, 17 | 1,520 | 67.10 | 1,520 | 64.13 |
| Lot 18 (CCICo) | 1,140 | 50.32 | 1,140 | 48.09 |
| Lot 19 (Turpinen) | 855 | 37.74 | 855 | 36.07 |
| Lot 20, (Savola) | 475 | 20.97 | 475 | 20.04 |
| Lot 22, (Pachette) | 475 | 20.97 | 475 | 20.04 |
| Lot 23, 24 (CCICo) | 1,425 | 62.90 | 1,425 | 60.12 |
| Lot 25, (Foreland) | 855 | 37.74 | 855 | 36.07 |
| Lot 26, (CCICo) | 855 | 37.74 | 855 | 36.07 |
| Lot 27 (Maki) | 855 | 37.74 | 855 | 36.07 |
| Lot 28, (CCICo) | 1,330 | 58.71 | 1,330 | 56.11 |
| Lot 29, (Mattson) | 1,710 | 75.49 | 1,710 | 72.14 |
| Lot 30, (Rund) | 1,330 | 58.71 | 1,330 | 56.11 |
| Lot 31 to 38 (CCICo) | 4,370 | 192.91 | 4,370 | 184.36 |
| Lot 72, (Lehman) | 100 | 4.41 | 100 | 4.22 |
| Lot 73, 74, 75 | 290 | 12.80 | 290 | 12.24 |
| Total | 32,690 | 1,443.04 | 31,740 | 1,339.06 |
| Collection Fees | | 14.43 | | 13.39 |
| Total Rented Buildings | | 1,457.47 | | 1,352.45 |
| Total Athens Iron Mng. Co. | 2,327,690 | 103,779.44 | 2,446,740 | 104,255.07 |

| DISPOSITION OF CHARGES | OPRTG. MINE | RTD. BLD. | OPRTG. MINE | RTD. BLDG. |
|---|---|---|---|---|
| Total as above | 102,321.97 | 1,457.47 | 102,902.62 | 1,352.45 |
| Charge 11 Months | 93,000.00 | 1,243.00 | 94,700.00 | 1,235.00 |
| Balance December Month | 9,321.97 | 214.47 | 8,202.62 | 117.45 |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

11. ACCIDENTS AND PERSONAL INJURY

The following table gives number and time lost from compensable accidents in the past seven years.

| | 1946 | 1945 | 1944 | 1943 | 1942 | 1941 | 1940 |
|---|---|---|---|---|---|---|---|
| Fatal | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Time Lost - Over 4 months | 1 | 0 | 2 | 4 | 2 | 1 | 1 |
| Time Lost - On 1 to 4 months | 2 | 7 | 7 | 4 | 9 | 7 | 4 |
| Time Lost - less than 1 month | 8 | 7 | 12 | 18 | 5 | 10 | 3 |
| Total Compensable accidents | 11 | 14 | 21 | 26 | 16 | 18 | 11 |
| Number of cases paid compensation for accidents prior to January 1st each year. | 1 | 4 | 4 | 4 | 4 | 4 | 4 |
| Number of cases paid difference in wages (included in above total). | 0 | 2 | 2 | 1 | 2 | 2 | 3 |

Nature and Classification of Compensable Accidents:

| Date | Remarks | Days Lost |
|---|---|---|
| 3/25/46 | Bruised back and right thigh. | 15 |
| 5/25/46 | Bruised right knee. | 12 |
| 6/25/46 | Contusion of back. | 10 |
| 8/22/46 | Bruised back. | 9 |
| 8/22/46 | Bruised lower left ribs. | 9 |
| 9/28/46 | Bruised arms, legs and back. | 12 |
| 10/14/46 | Fracture, body of 1st lumbar vertebra. | Home |
| 10/29/46 | Amputation, left middle finger. | 59 |
| 11/6/46 | Laceration, palm, left hand. | 13 |
| 12/3/46 | Bruised right knee. | 10 |
| 12/18/46 | Strained back. | Home |
| | In addition to the above two men were accepted as occupational disease cases. | |

There were 11 compensable accidents in 1946 as compared to 14 in 1945. The Athens Mine had a severty rating of 1.226 as compared to 1.388 for all company properties. The frequency rating was 36.496 as compared to 37.812 for all company properties.

12. NEW CONSTRUCTION AND PROPOSED NEW CONSTRUCTION:

Following is a detail of the E & A authorized in 1946:

E & AM - 17 - Purchase of Equipment for block caving operations.
Approved November 21, 1946.

| | |
|---|---|
| 2 - 40 HP Scraper Hoists | $6,410.00 |
| 2 - 60 HP Scrapers | 360.00 |
| Misc. Incidental Equipment | 1,000.00 |
| Total | $7,770.00 |

E & A No. AM - 15 and AM - 16 - were closed during the year.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

## 13. EQUIPMENT AND PROPOSED EQUIPMENT:

### a. Scraper Hoists:

Following is a list of scraper hoist equipment at the mine:

| Company | | Machines | 1946 Total Cost Of Machines Repaired | 1946 Each Mach. Repaired | 1945 Total Cost Of Machines Repaired | 1945 Each Mach. Repaired |
|---|---|---|---|---|---|---|
| Sullivan | 15 H.P. Elec. | 17 | 10 | 239.72 | 5 | 320.37 |
| Sullivan | 20 H.P. " | 3 | 2 | 234.84 | 3 | 285.17 |
| Sullivan | 25 H.P. " | 1 | 1 | 71.47 | | |
| Ing.-Rand | 15 H.P. " | 6 | 4 | 232.39 | 3 | 300.08 |
| Ing.-Rand | 20 H.P. " | 7 | 3 | 399.44 | 3 | 357.21 |
| Ing. Rand | 25 H.P. " | 6 | 1 | 195.59 | 2 | 220.86 |
| Total | | 40 | 21 | 250.56 | 16 | 285.68 |

In 1946 two new Ingersoll Rand 25 H.P. Electric scraper hoists were purchased. Two second hand 15 H.P. Sullivan Electric hoists from Princeton Mine were purchased.

### b. Drill Machines:

Purchases in 1946 and 1945 are listed below:

| 1946 | 1945 |
|---|---|
| 2 - RB-12-Ingersoll-Rand Auger Drill Machines | 4 - RB-12-Ingersoll-Rand Auger Drill Machines |
| 4 - Pickhammer Machines purchased from Princeton Mine. | |

### c. Motor Haulage Cars:

Four second hand 65 Cu. Ft. Rocker Dump Cars were purchased from the Princeton Mine during the year.

### d. Timber Hoists:

Five second hand utility air hoists were purchased from the Princeton mine in 1946.

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

14. MAINTENANCE AND REPAIRS:

a. Steel Trestles:

Some new planking was installed on the steel trestles where the old had rotted out.

b. Comparison of Costs - 1946 with 1945:

Maintenance and repairs listed under underground costs:

| | Amount | Cost per Ton |
|---|---|---|
| 1946 | 53,483.54 | .145 |
| 1945 | 49,993.77 | .113 |
| Increase | 3,489.77 | .032 |

Maintenance and repairs listed by the four accounts as shown on the cost sheet:

| | 1946 | 1945 | Increase | Decrease |
|---|---|---|---|---|
| Comp. and Power Drills | 2,532.74 | 3,192.65 | | 659.91 |
| Scraper Equipment | 28,004.31 | 24,631.48 | 3,372.83 | |
| Elec. Tram Equipt. | 19,224.83 | 19,771.22 | | 546.39 |
| Pumping Machinery | 3,721.66 | 2,398.42 | 1,323.24 | |
| Total | 53,483.54 | 49,993.77 | 3,489.77 | |

Purchases 1946

Power Drills: 2 RB-12-Ingersoll-Rand Drill Machines.
Scraper Hoists: 2 Ingersoll-Rand 25 H.P. Electric Hoists.

Maintenance and repairs listed under surface costs:

| | Amount | Cost Per Ton |
|---|---|---|
| 1946 | 28,278.68 | .077 |
| 1945 | 37,648.62 | .086 |
| Decrease | 9,369.94 | .009 |

b. Comparison of Costs - 1946 with 1945:

Maintenance and repairs listed in the five accounts as shown on the cost sheet:

| | 1946 | 1945 | Decrease |
|---|---|---|---|
| Hoisting Equipment | 13,112.14 | 14,181.83 | 1,069.69 |
| Shaft | 5,492.77 | 8,640.15 | 3,147.38 |
| Top Tram Equipment | 915.10 | 2,193.89 | 1,278.79 |
| D. T. & Pockets | 2,076.09 | 2,948.25 | 872.16 |
| Mine Buildings | 6,682.58 | 9,684.50 | 3,001.92 |
| Total | 28,278.68 | 37,648.62 | 9,369.94 |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

15. POWER:

Detail of electric current purchased compared with 1945:

| | 1946 - 12 Mos. Optg. Cost | 1946 - 12 Mos. Optg. Per Ton | 1945 - 12 Mos. Optg. Cost | 1945 - 12 Mos. Optg. Per Ton |
|---|---|---|---|---|
| Stoping | 2,148.79 | .006 | 2,749.82 | .006 |
| Ventilation | 11,640.65 | .032 | 12,615.59 | .029 |
| Pumping | 21,157.77 | .058 | 21,774.58 | .050 |
| Hoisting | 21,082.69 | .057 | 24,944.48 | .057 |
| Stocking Ore | 532.29 | .001 | 672.15 | .001 |
| Dry House | 682.32 | .002 | 874.69 | .002 |
| Lights at Levels | 647.44 | .002 | 724.51 | .002 |
| Compressors | 23,960.35 | .065 | 28,757.13 | .066 |
| Electric Haulage | 2,062.79 | .006 | 2,432.32 | .005 |
| Shops | 317.63 | .001 | 417.16 | .001 |
| Heating | 17.73 | .000 | 17.54 | .000 |
| Office | 47.65 | .000 | 53.85 | .000 |
| Storage Battery Loco. | 192.04 | .000 | 29.50 | .000 |
| Surface Lights | 432.26 | .001 | 421.19 | .001 |
| Total | 84,922.40 | .231 | 96,484.51 | .220 |
| Main Line Meter - K.W. | 6,082,000 | | 6,798,000 | |
| Separate Meter Readings | 5,891,498 | | 6,598,367 | |
| Line Loss | 190,502 | | 199,633 | |
| Product | 367,361 | | 438,427 | |
| K.W. Per Ton (Inc. Line Loss) | 16.556 | | 15.505 | |
| Cost Per K.W. (Avg.) | .013962907 | | .014193073 | |
| 15 Min. Demand (Avg.) | 1308 | | 1577 | |
| Load Factor (Avg.) | 54.75% | | 48.92% | |

Note: Above includes power for operating and idle period.

17. CONDITION OF PREMISES:

a. The grounds around the mine were kept in good condition throughout the year.

b. Athens Mine Houses

The following statement gives the total cost of repairs and the average cost per house for 1946 and 1945:

| Year | No. Houses | Amount Repairs | Avg. Cost Per House | Rental Income | Taxes and Insurance | Net Income |
|---|---|---|---|---|---|---|
| 1946 | 31 | 612.45 | 19.76 | 5,962.52 | 1,969.00 | 3,381.07 |
| 1945 | 30 | 6,760.91 | 225.36 | 5,329.80 | 1,490.10 | 2,921.21 |

ATHENS MINE
ANNUAL REPORT
YEAR - 1946

18. NATIONALITY OF EMPLOYEES:

The following statements show, first, the nationality by parentage, and secondly, a separation of nationalities into American and Foreign Born.

| As to Parentage | 1946 | Percent | 1945 | Percent |
|---|---|---|---|---|
| Finnish | 140 | 41.5 | 133 | 41.8 |
| Italian | 56 | 16.6 | 53 | 16.7 |
| English | 58 | 17.2 | 52 | 16.3 |
| French (Canadian) | 37 | 11.0 | 35 | 11.0 |
| Swedish | 22 | 6.5 | 25 | 7.9 |
| French (France) | 1 | 0.3 | 1 | 0.3 |
| Scotch | | | 1 | 0.3 |
| German | 4 | 1.2 | 4 | 1.3 |
| Austrian | 6 | 1.8 | 4 | 1.3 |
| Norwegian | 6 | 1.8 | 5 | 1.6 |
| Irish | 3 | 0.9 | 2 | 0.6 |
| Greek | 1 | 0.3 | 1 | 0.3 |
| Polish | 2 | 0.6 | 2 | 0.6 |
| Bohemian | 1 | 0.3 | 0 | 0 |
| Total | 337 | 100. | 318 | 100. |

| | American Born | | Foreign Born | |
|---|---|---|---|---|
| | 1946 | 1945 | 1946 | 1945 |
| Finnish | 102 | 96 | 38 | 37 |
| English | 46 | 40 | 12 | 12 |
| Italian | 26 | 22 | 30 | 31 |
| French (Canadian) | 35 | 32 | 2 | 3 |
| Swedish | 17 | 20 | 5 | 5 |
| French (France) | 1 | 1 | 0 | 0 |
| Scotch | 0 | 1 | 0 | 0 |
| German | 4 | 4 | 0 | 0 |
| Austrian | 5 | 3 | 1 | 1 |
| Norwegian | 6 | 5 | 0 | 0 |
| Irish | 3 | 2 | 0 | 0 |
| Greek | 0 | 0 | 1 | 1 |
| Danish | 0 | 0 | 0 | 0 |
| Polish | 2 | 2 | 0 | 0 |
| Bohemian | 1 | 0 | 0 | 0 |
| Total | 248 | 228 | 89 | 90 |
| Percent | | 71.7% | | 28.3% |

Average men for this report based on the number of men working during the eight months the mine was operating.

# CAMBRIA-JACKSON MINE
# ANNUAL REPORT
# YEAR 1946

1. GENERAL:

The Cambria-Jackson Mine operated on an eleven-shift per week schedule from January 1st, 1946 until February 8th, 1946, when employees went out on strike. The strike lasted from February 7th to May 22nd, or approximately three and one-half months. After resumption of work on May 22nd the mine continued on an eleven-shift per week basis until June 24th when the schedule was changed to twelve shifts per week, which has been maintained to the present time. This increased schedule and more economical operation was made possible by organizing a midnight shift crew of ten men to take down mostly all the timber and supplies.

There was not much accomplished during the strike except to keep the main levels and sub-levels in operating condition. However we did manage to change underground cars. All the old 2.3-ton capacity cars, 23 in number, were taken to surface and 16 new 4-ton capacity rocker dump cars were taken underground. The increased height of the new cars necessitated the cutting of all the chutes, which was also completed during the idle period.

Also during the strike period the smoke-stack of the heating plant in the dry developed into a hazardous condition and had to be renewed. The new stack was constructed at the general shops and the men at the mine did the erecting.

The Cambria-Jackson Mine had a very successful and prosperous year, discounting the strike. It developed almost as much standard ore as it produced, developed a large tonnage of high-sulphur ore, produced almost as much ore in the 8½ months operating period of 1946 as in the full year of 1945, being only 18,854 tons short, made many improvements to the plant and equipment and at a cost of only 2.6 cents per ton more than in 1945, including an 18½-cent increase in wages and a large increase in costs of supplies.

2. PRODUCTION SHIPMENTS & INVENTORIES:

a. Production by Grades:

| | 1946 | 1945 | Increase | Decrease |
|---|---|---|---|---|
| Cambria Lease Ore | 4,378 | | 4,378 | |
| Jackson Strip Ore | 294,813 | 315,514 | | 20,701 |
| Rock | 9,704 | 3,708 | 5,996 | |
| Total Hoist | 308,895 | 319,222 | | 10,327 |

The above figures include a stockpile overrun of 5,014 tons, of which 2,483 tons were credited to 1946 production and 2,531 tons to 1945.

b. Shipments:

| | Pocket Tons | Stockpile Tons | Total Tons | Total Tons Last Year |
|---|---|---|---|---|
| Cambria Lease | | | | |
| Jackson Strip | 168,283 | 63,268 | 231,551 | 294,493 |
| Total 1946 | 168,283 | 63,268 | 231,551 | 294,493 |
| Total 1945 | 207,659 | 86,834 | 294,493 | |
| Decrease | 39,376 | 23,566 | 62,942 | |

Shipments decreased 21.37% in 1946 and were 65,109 tons less than the product for the year.

CAMBRIA-JACKSON MINE

YEAR 1946

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

2. PRODUCTION SHIPMENTS & INVENTORIES: (CONT.)

c. Stockpile Inventories:

| | Dec. 31, 1946 | Dec. 31, 1945 | Increase |
|---|---|---|---|
| Cambria Lease | 4,378 | | 4,378 |
| Jackson Strip | 106,858 | 43,596 | 63,262 |
| Total | 111,236 | 43,596 | 67,640 |

d. Division of Product by Levels:

| | 1946 | Percentage | 1945 | Percentage |
|---|---|---|---|---|
| 6th Level | 85,616 | 28.86 | 95,700 | 30.09 |
| 7th Level | 211,044 | 71.14 | 222,345 | 69.91 |
| Total | 296,660 | 100.00 | 318,045 | 100.00 |

e. Production by Months:

| Month | Cambria Lease | Jackson Strip | Total Ore | Rock |
|---|---|---|---|---|
| January | 475 | 25,333 | 25,808 | 1,020 |
| February | 283 | 5,566 | 5,849 | 284 |
| April | | 133 | 133 | |
| May | | 6,413 | 6,413 | 116 |
| June | | 33,277 | 33,277 | 1,276 |
| July | | 33,716 | 33,716 | 2,160 |
| August | | 34,919 | 34,919 | 2,512 |
| September | | 35,671 | 35,671 | 948 |
| October | 1,501 | 45,769 | 47,270 | 840 |
| November | 1,517 | 33,520 | 35,037 | 348 |
| December | 2,022 | 34,062 | 36,084 | 200 |
| | 5,798 | 288,379 | 294,177 | 9,704 |
| Transfers | 1,420 | 1,420 | | |
| Overruns | | 2,483 | 2,483 | |
| Total 1946 | 4,378 | 292,282 | 296,660 | 9,704 |
| Total 1945 | | 318,045 | 318,045 | 3,708 |
| Increase | 4,378 | | | 5,996 |
| Decrease | | 25,763 | 21,385 | |

f. Ore Statement:

| | Cambria Lease | Jackson Strip | Total 1946 | Total 1945 |
|---|---|---|---|---|
| On Hand Jan.1,1946 | | 43,596 | 43,596 | 22,575 |
| Output for Year | 5,798 | 288,379 | 294,177 | 315,514 |
| Transfers | 1,420 | 1,420 | | |
| Overruns | | 5,014 | 5,014 | |
| Total | 4,378 | 338,409 | 342,787 | 338,089 |
| Shipments | | 231,551 | 231,551 | 294,493 |
| Bal.on Hand Dec.31,1946 | 4,378 | 106,858 | 111,236 | 43,596 |
| Increase in Output | 5,798 | 27,135 | 21,337 | 44,973 |
| Increase in Ore on Hand | 4,378 | 63,262 | 67,640 | 21,021 |

1946 - Five 2-8 hr. Shifts and 1 1-8 hr. Shift 1-1-46 to 6-24-46
Six 2-8 hr. Shifts 6-24-46 to 12-31-46

1945 - Five 2-8 hr. Shifts 1-1-45 to 1-22-45
Five 2-8 hr. Shifts and 1 1-8 hr. Shift 1-22-45 to 12-31-45

1944 - Five 2-8 hr. Shifts and 1 1-8 hr. Shift 1-1-44 to 7-1-44
Five 2-8 hr. Shifts 7-1-44 to 12-31-44

1943 - Five 3-8 hr. Shifts and 1 2-8 hr. Shift 1-1-43 to 6-12-43
Five 3-8 hr. Shifts and 1 1-8 hr. Shift 6-12-43 to 7-6-43
Five 2-8 hr. Shifts and 1 1-8 hr. Shift 7-6-43 to 12-31-43

2. PRODUCTION SHIPMENTS & INVENTORIES: (CONT.)

g. Delays:

June 17, 1 hour delay - No loss in product
Burned cable from resistance coils of hoist in Engine House.

July 18, 5 hours delay - Loss of Product - 300 Tons
Broken bail on west skip.

July 26, 6½ hours delay - Loss of Product - 400 Tons
Bent bail on west skip.

August 2, 1 hour delay - Loss of Product - 100 Tons
Replacing safety catch on skip.

September 23, 2 hours delay - Loss of Product - 300 Tons
Fire in air receiver.

October 14, 3 hours delay - Loss of Product - 350 Tons
Burned out transformer at Sub-Station.

October 22, 5¼ hours delay - Loss of Product - 200 Tons
Replacing broken shaft runner.

November 27, 1 hour delay - Loss of Product - 100 Tons
Replacing brushes on hoist motor.

December 17, 2 hours delay - Loss of Product - 300 Tons
Replacing safety catch on skip.

The total loss of product from the 9 delays listed above amounted to 2,050 tons, as compared with 14 delays and a loss of 3,986 tons in 1945.

h. Delays Due to Lack of Current:

Considerable trouble was experienced during 1946 with low voltage. At times the voltage was so low that the hoist could not be operated. On December 15th two 50-K.V.A. transformers were added at the transformer station, increasing the voltage to 24,000 at the station. This change improved operations some but the voltage is still low at full load.

The probable solution to this problem is to move the transformer station, which at the present time is about 1,800 feet distant from the engine house, and place it close to the engine house.

3. ANALYSIS:

a. Average Mine Analysis on Output:

| Grade | Tons | Iron | Phos. | Silica | Sulphur |
|---|---|---|---|---|---|
| Cambria-Jackson | 296,660 | 58.82 | .086 | 8.74 | .021 |

b. Average Mine Analysis on Straight Cargoes:

All ore shipped was mixed with other grades.

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

4. ESTIMATE OF ORE RESERVES:

a. Developed Ore:

Assumption: 12.00 cubic feet equals one ton
10% deduction for loss in mining and rock

Percentage of Bessemer: None.

| | Standard Ore | | | | Sulphurous Ore | |
|---|---|---|---|---|---|---|
| | Negaunee | | Ishpeming | | Negaunee | Ishpeming |
| Area | Cambria Lease | Jackson Strip | Jackson Strip | Total | Jackson Strip | |
| Above 5th Lev. - Dep. #1 | 24,394 | | | 24,394 | | |
| Bet.5th&6th Lev.-Dep. #1 | 41,146 | | | | | |
| Bet.5th&6th Lev.-Dep. #2 | 2,667 | 262,570 | | | | |
| Tot.Bet.5th&6th Levels | 43,813 | 262,570 | | 306,383 | | |
| Bet.6th&7th Lev.-Dep.#2 | 3,188 | 1,374,260 | | | 350,717 | |
| Bet.6th&7th Lev.-Dep. #3 | 2,188 | 19,685 | 139,026 | | | |
| Bet.6th&7th Lev.-Dep. #4 | | | | | | 135,243 |
| Tot.Bet.6th&7th Levels | 5,376 | 1,393,945 | 139,026 | 1,538,347 | 350,717 | 135,243 |
| Below 7th Level - Dep. #2 | | 14,688 | | | 146,771 | |
| Below 7th Level - Dep. #3 | | 1,979 | 7,500 | | | |
| Below 7th Level - Dep. #4 | | | | | | 138,854 |
| Tot. Below 7th Level | | 16,667 | 7,500 | 24,167 | 146,771 | 138,854 |
| Gross as of Nov.30,1946 | 73,583 | 1,673,182 | 146,526 | 1,893,291 | 497,488 | 274,097 |
| Less Dec.1946 Production | | 36,084 | | 36,084 | | |
| Gross as of Dec.31,1946 | 73,583 | 1,637,098 | 146,526 | 1,857,207 | 497,488 | 274,097 |
| Less 10% for Mng. & Rock | 7,358 | 167,318 | 14,653 | 189,329 | 49,749 | 27,410 |
| Net Tot.as of Dec.31,1946 | 66,225 | 1,469,780 | 131,873 | 1,667,878 | 447,739 | 246,687 |

b. Total Developed Ore:

| | Cambria Lease | Jackson Strip | Total |
|---|---|---|---|
| 1946 Estimate | 66,225 | 1,601,653 | 1,667,878 |
| 1945 Estimate | 70,452 | 1,649,731 | 1,720,183 |
| Decrease | 4,227 | 48,078 | 52,305 |

The ore estimate at the Cambria-Jackson Mine is divided between the Cambria Lease and Jackson Strip in the City of Negaunee and a portion of the Jackson Strip in the City of Ishpeming. The product in 1946 was 296,660 tons from which amount the decrease in reserves of 52,305 tons must be deducted, making a total of 244,355 tons developed in 1946. The increase in developed ore was due to increases in areas of ore being mined. In addition to the 244,355 tons of standard ore developed in 1946 an estimated 274,097 tons of high-sulphur ore was developed West of the main North-South fault on the Seventh Level.

c. Expected Average Natural Analysis:

| Grade | Trade Name | Tons | Iron | Phos. | Sil. | Mang. | Alum. | Lime | Mag. | Sul. | Loss | Moist. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-Bess. | Camb.-Jack. | 1,667,878 | 51.32 | .087 | 8.31 | .17 | 2.46 | .55 | .18 | .035 | 3.00 | 12.50 |
| Non-Bess. | Camb.-Jack.Spec. | 694,426 | 52.50 | .105 | 6.56 | .11 | 2.44 | .61 | .44 | .263 | 1.69 | 12.50 |
| | | 2,362,304 | | | | | | | | | | |

d. Ore in Stock; Average Natural Analysis:

| Grade | Trade Name | Tons | Iron | Phos. | Sil. | Mang. | Alum. | Lime | Mag. | Sul. | Loss | Moist. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-Bess. | Camb.-Jack. | 111,236 | 51.876 | .079 | 7.914 | .168 | 2.493 | .557 | .177 | .012 | 3.024 | 11.50 |

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

5. LABOR AND WAGES:

a. Comments:

There were 220 men on the payroll on December 31st, 1946 as compared with 185 on December 31st, 1945, showing an increase of 35 men. During the year one man re-entered the army, 9 quit to take other jobs, one was retired, two went back to college, one died and four were transferred to other mines, making a total of 18 separations. During the same period 53 men were hired: two transferred from the Lloyd Mine, twenty-two from the Princeton Mine, one from the Athens Mine, two from the Tilden Mine, one from the landscaping crew, eighteen returned service men and seven new men.

b. Comparative Statement of Wages and Product:

| | | 1946 | 1945 | Increase | Decrease |
|---|---|---|---|---|---|
| Product: | | 296,660 | 315,514 | | 18,854 |
| No. Shifts and Hours | 1-8 | 11 | 57 | | 46 |
| | 2-8 | 207 | 242 | | 35 |
| Average No. Men Working: | | | | | |
| Surface | | 55 | 52 | 3 | |
| Underground | | 148 1/2 | 131 | 17 1/2 | |
| Total | | 203 1/2 | 183 | 20 1/2 | |
| Average Wages per Day: | | | | | |
| Surface | | 9.25 | 7.75 | 1.50 | |
| Underground | | 10.63 | 8.83 | 1.80 | |
| Total | | 10.25 | 8.52 | 1.73 | |
| Average Wages per Month: | | | | | |
| Surface | | 237.70 | 188.10 | 49.60 | |
| Underground | | 272.72 | 207.76 | 64.96 | |
| Total | | 263.25 | 202.17 | 61.08 | |
| Product per Man per Day: | | | | | |
| Surface | | 25.74 | 20.83 | 4.91 | |
| Underground | | 9.50 | 8.53 | .97 | |
| Total | | 6.94 | 6.05 | .89 | |
| Labor Cost per Ton: | | | | | |
| Surface | | .375 | .372 | .003 | |
| Underground | | 1.160 | 1.035 | .125 | |
| Total | | 1.535 | 1.407 | .128 | |
| Average Product Mining: | | | | | |
| Stoping | | 26.93 | 23.85 | 3.08 | |
| Development in Ore | | 10.17 | 8.13 | 2.04 | |
| Total | | 25.33 | 23.36 | 1.97 | |
| Avg. Wages Contract Labor: | | 11.42 | 9.62 | 1.80 | |
| Total Number of Days: | | | | | |
| Surface | | 12,014 1/2 | 15,149 1/2 | | 3,135 |
| Underground | | 32,393 3/4 | 36,987 1/2 | | 4,593 3/4 |
| Total | | 44,408 1/4 | 52,137 | | 7,728 3/4 |
| Amount for Labor: | | | | | |
| Surface | | 111,124.24 | 117,373.32 | | 6,249.08 |
| Underground | | 344,238.85 | 326,596.74 | 17,642.11 | |
| Total | | 455,363.09 | 443,970.06 | 11,393.03 | |
| Avg. Wages per Mo. as per Labor Statement - Less Capt. and Clerks: | | | | | |
| Surface | | 239.85 | 188.93 | 50.92 | |
| Underground | | 272.25 | 206.86 | 65.39 | |
| Total | | 263.92 | 202.03 | 61.89 | |

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

5. LABOR AND WAGES: (CONT.)

b. Comparative Statement of Wages and Product: (Cont.)

Proportion of Surface to Underground Men:

1946 1 to 2.70
Five 2-8 hour Shifts and 1 1-8 hour Shift 1-1-46 to 6-24-46
Six 2-8 hour Shifts 6-24-46 to 12-31-46

1945 1 to 2.52
Five 2-8 hour Shifts 7-1-44 to 1-22-45
Five 2-8 hour Shifts and 1 1-8 hour Shift 1-22-45 to 12-31-45

1944 1 to 2.52
Five 2-8 hour Shifts and 1 1-8 hour Shift 7-6-43 to 7-1-44
Five 2-8 hour Shifts 7-1-44 to 12-31-44

| Note: | | 1946 | 1945 |
|---|---|---|---|
| | Proportion of Vacation Pay for Surface | 6,040.55 | 3,500.83 |
| | Proportion of Vacation Pay for Underground | 16,014.30 | 7,860.50 |
| | Total | 22,054.85 | 11,361.33 |

This statement of wages and product for the year 1946 was calculated for the actual operating period, or approximately 8½ months.

6. SURFACE:

a. Buildings:

Engine House:

The final alignment and adjusting of the compressor, which was under erection at the end of last year, was completed on January 15th and put in operation. This installation made a big improvement in operating conditions and increases the air capacity at the mine sufficiently to take care of a breakdown in either unit.

During the strike period the hoisting engineers, in their spare time, painted the floors and all the machinery, which improved the interior appearance considerably.

Dryhouse:

The covering of the exterior walls of the Dry with imitation brick steel sheeting was completed and the entire building given two coats of paint. Also a new smoke-stack was erected for the heating plant, located in the Dryhouse.

Office:

New porches and steps for the two front entrances were built, all the siding repaired and renailed, exterior brickwork of the vault repaired, and the entire building given two coats of paint.

Shops:

Construction of a new building for a carpenter shop, blacksmith shop and machine shop was started on October 24th, and is located West and South of the office building. E.&A. No. CC-174 was authorized for an expenditure of $38,740.00. This includes a new concrete block building with a flat concrete and steel roof, sewerage, water, heating and electrical controls, lighting, electric power circuits, revamping present machines and electric equipment, and add a new bolt-threading machine and a new drill sharpening machine with accessories and dies. The old shops will be used for storage and two of the sheds now used for that purpose will be dismantled. At the end of the year all of the concrete foundation was completed and about 30% of the concrete block laid.

6. SURFACE: (CONT.)

b. Ore and Rock Trestles and Stocking Grounds:

Due to the fact that all the stocked ore was not loaded out this year and the production is increasing it was found necessary to add an additional trestle and also to extend the Northeast stocking grounds to the East. The new trestle, consisting of 4 permanent and 22 stocking bents, was erected on the Southeast stocking grounds between the pocket track and customary Southeast trestle. At the end of the year 13 stocking bents had been erected on the Northeast stocking ground to which about 10 or 12 more bents will be added for the stocking season. During the year the Northeast stocking ground was extended about 300 feet Easterly and rocked.

c. Railroad Tracks:

Practically all the track layout on the property was revamped. The entire main track was relocated and extended about 400 feet East to provide a longer switchback for the pocket track. The relocation shifted the track further South along the Southeast stocking grounds, making it possible to extend the stocking ground about 200 feet to the East, if it should be found necessary. The pocket track was realigned and extended across the cave West of the shaft to make room for a 24-hour supply of empty cars for pocket loading. The fill across the cave was put in with the mine bulldozer and mine labor. The pocket track West of the shaft was changed from a 1% grade to a 1½% to improve the spotting of cars at the pocket.

d. Fences and Caves:

There are numerous pits and caves over the mining areas of the Cambria-Jackson Mine, each of which were individually fenced, and on several occasions some of these fences had to be moved because of the enlargement of caving areas. Many of these fences were in poor condition and would require rebuilding and it was a foregone conclusion that other caves would occur outside of the fenced areas, so it was decided to inclose the entire mining area West of the shaft with one fence. This project required about 8,500 feet of fencing in addition to a portion of the existing fence which was of proper construction and in the right location. The erection of the fence was started in June and completed in October. The fence is constructed of cedar posts with 48-inch netting on the bottom and three strands of barbed wire on top, making a very substantial fence seven feet in height.

e. Grounds:

A considerable amount of work on the grounds was done during the year. A new 18-foot road, constructed of crushed rock with an asphalt penetration, was built from the main U.S.-41 Highway to the pocket track, a distance of about 550 feet. The City of Negaunee furnished the labor, material and equipment, and were reimbursed for all expenses by the Cambria-Jackson Mine. This road eliminates the previous muddy conditions of travel and is located far enough away from the line of the shaft and engine house so that the grease and mud thrown off from the hoisting cables does not hit passing cars and pedestrians.

All the grounds between the pocket track and the office and dry buildings were filled with rock and graded except the portion immediately in front of the buildings which was filled and graded with good top soil. The area in front of the buildings which is to be landscaped was inclosed with a concrete curb and a retaining wall was built along the high bank North and Northeast of the Dry. A five-foot concrete walk was constructed along the West side of the Dry extending to the front curb, and one along the North side extending along the front of the office to the West curb.

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

6. SURFACE: (CONT.)

e. Grounds: (Cont.)

A concrete walk was also built from the front entrance of the Office to the North curb. The lateness in the season of the completion of this work did not permit any planting except the placing of three maple trees. Except for cost of materials this project was done very cheaply as almost all of the work was done by mine laborers in spare time when the steam shovel was not operating or other jobs pressing.

7. UNDERGROUND:

a. Shaft Sinking:

There was no shaft sinking in 1946.

b. Development:

The following table gives a comparison of total feet of drifting and raising in ore and rock in 1946 and 1945:

| | Drifting | | Raising | | Grand |
|---|---|---|---|---|---|
| Year | Ore | Rock | Ore | Rock | Total |
| 1946 | 896' | 992' | 269' | 538' | 2,695' |
| 1945 | 79' | 384' | 473' | 143' | 1,079' |
| Increase | 817' | 608' | | 395' | 1,820' |
| Decrease | | | 204' | | |

The large increase in development footage was due to the extension of the main haulage drift to the West towards the Mather Mine and the South haulage drift West to ore discovered in underground Diamond Drill Hole No. 163 which was drilled from the South side of the main footwall drift approximately 100 feet East of and parallel with the large North-South fault.

Development work on the Sixth Level and above consisted of connecting the top of a cribbed rock raise put up from the 25' Sub to the end of the South main haulage drift on the Sixth Level and developing two sub-level stopes above the level.

Development on the Seventh Level consisted of extending the main footwall drift 696 feet Westerly and the South haulage drift 270 feet Westerly and advancing a crosscut due South from the footwall drift at about 350 feet West of the main North-South fault or 70 feet East of where the ore was first encountered in the main drift.

b-1. Rock Development:

The following table gives the total footage of rock drifting and raising for 1946 and 1945:

| | Drifting | Raising | Total 1946 | Total 1945 |
|---|---|---|---|---|
| 6th Level and above | 85' | None | 85' | 119' |
| 7th Level and above | 625' | 269' | 894' | 337' |
| Total | 710' | 269' | 979' | 456' |
| Total 1945 | 313' | 143' | 456' | |
| Increase | 397' | 126' | 523' | |

The extension of the Seventh Level main footwall drift and the South haulage drift accounted for most of the rock drifting during the year. The footwall drift encountered 408 feet of rock and the South drift 77 feet.

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

7. UNDERGROUND: (CONT.)

b-1. Rock Development: (Cont.)

The balance of footage, 140 feet, shown under caption of 7th Level and above consisted of extending the 25' Sub 60 feet East for ventilation and 80 feet of dog-drifting to develop a sub-level stope above the 50' Sub. The rock raising listed under 7th Level and above consisted of 68 feet of rock in No. 709 Raise and 10 feet in No. 751 Raise put up from the Seventh Level, 86 feet of single-compartment raise from the 25' Sub-Level to the elevation of the 6th Level for ventilation and 105 feet of dog-raise to develop a sub-level stope above the 50' Sub.

Rock work on the Sixth Level consisted of 30 feet of dog-drift to connect from the top of ventilation raise put up from the 25' Sub to the end of the South main haulage drift on the Sixth Level for ventilation, 20 feet of dog-drift on the 160' Sub in the South Riser Orebody for exploratory purposes and 35 feet of timbered drift on the 140' Sub, also in the South Riser Orebody.

b-2. Ore Development:

The following is a summary of ore development in 1946 as compared with 1945:

| | Drifting | Raising | Total 1946 | Total 1945 |
|---|---|---|---|---|
| 6th Level | 318' | 287' | 605' | 380' |
| 7th Level | 674' | 251' | 925' | 243' |
| Total | 992' | 538' | 1,530' | 623' |
| Total 1945 | 298' | 325' | 623' | |
| Increase | 694' | 213' | 907' | |

Included in above statement is 427 feet of ore drift in the extension of the main footwall drift towards the Mather Mine and 197 feet in the advance of the 7th Level South haulage drift, 70 feet of ore in No. 709 Raise, 32 feet in No. 737 Raise, 22 feet in No. 739 Raise, and 52 feet in No. 751 Raise.

c. Stoping:

(1) General:

At the end of 1946 there were five gangs slicing, nine sub-level caving or developing for sub-level caving, two developing for sub-level stoping, one drifting, two raising and two repairing, a total of twenty-one gangs, as compared with seventeen gangs at the end of 1945. It will be noted that at the present time only five gangs are mining by the top-slicing system, whereas a year ago all gangs used this system. Most of the mining is now done by the sub-level caving method, which has increased production at a lower cost. At the present time sub-level stoping is being given a trial in three areas. To date this system has proved very unsatisfactory because of the fact that the hanging will not hold up and the contamination is so great that the ore becomes unmerchantable. If conditions do not improve, mining in these areas will be converted to sub-level caving, in which contamination can be controlled to a degree. The change to sub-level caving has improved working conditions considerably, especially at this mine because of the fact that this system requires much less timber and very little repairs as compared to top-slicing. The bottleneck to high production at the Cambria-Jackson is its shaft in which there are only two hoisting compartments, the skips being attached underneath the cages. With a reduction in the amount of timber taken down more time is available for hoisting ore.

7. UNDERGROUND: (CONT.)

c. Stoping: (Cont.)

(1) General: (Cont.)

The problem of taking down timber and supplies was partially solved during the year. In May, a crew was organized to work on the midnight shift to take down timber and supplies, and when possible to hoist ore and rock. This arrangement proved very satisfactory and has considerably increased production.

On September 22nd, a double-deck cage was put in operation to speed up the lowering of men and increase the time for hoisting ore. This alteration saves from 15 to 20 minutes at every change of shifts, which means a possible increase of 15 to 20 skips of ore per day.

The location and number of mining contracts at the end of 1946, as compared with 1945, are as follows:

| Location of Contracts | December 31, 1946 | December 31, 1945 |
|---|---|---|
| Sixth Level and Above | | |
| 280' Sub-Level | | 2 |
| 240' Sub-Level | | 2 |
| 220' Sub-Level | 1 | |
| 200' Sub-Level | 1 | |
| 140' Sub-Level | 2 | |
| Sixth Level | | 1 |
| Seventh Level and Above | | |
| 90' Sub-Level | 2 | 2 |
| 50' Sub-Level | 3 | 3 |
| 35' Sub-Level | 2 | 2 |
| 25' Sub-Level | 2 | 5 |
| 00' Sub-Level | 5 | |
| Seventh Level | 3 | |
| Total | 21 | 17 |
| Increase | 4 | |

Occupation of contracts were as follows:

| | December 31, 1946 | December 31, 1945 |
|---|---|---|
| Mining | 14 Contracts | 13 Contracts |
| Repairing | 2 Contracts | 3 Contracts |
| Raising | 2 Contracts | 1 Contract |
| Drifting | 1 Contract | |
| Developing Sub-Lev. Stopes | 2 Contracts | |
| Total | 21 Contracts | 17 Contracts |

(2) Detail of Stoping:

280' Sub - South Riser Orebody:

This sub was started in January 1945 and completed in February 1946, all by the radial sub-level caving system.

260' Sub - South Riser Orebody:

This sub was started in April 1945 and completed in October 1946. The portion mined in 1946 was the area located West of the main North-South dike and was done by two gangs on the radial sub-level caving system.

7. UNDERGROUND: (CONT.)

c. Stoping: (Cont.)

(2) Detail of Stoping: (Cont.)

240' Sub - South Riser Orebody:

Work on this sub was started in October 1945. The mining of all ore East of the main North-South dike was completed during 1946 by sub-level caving. A small area at the South end of the ore West of the North-South dike was also mined, being a part of a sub-level stope developed from the 200' Sub up to the floor of the 260' Sub. It will be noted that the ore area on this sub, East of the North-South dike, was much smaller than the sub above due to a big bulge or flattening of the footwall. The balance of the ore at this elevation located West of the North-South dike will be mined by sub-level stoping, the development of which is underway at the present time.

220' Sub - South Riser Orebody:

The 220' Sub was started in August and at the present time there is one gang engaged in sub-level caving the ore South of the East-West dike. An attempt was made to sub-level stope the ore between the two East-West dikes and East of the North-South dike, but failed due to the character of the ore and the vast amount of broken rock above. This stope extended from the 120' Sub up to the 240' Sub, including an area on the 220' Sub. The area mined on the South end of the ore West of the North-South dike was mined through the sub-level stope developed from the 200' Sub up to the 260' Sub.

200' Sub - South Riser Orebody:

Work to develop a small sub-level stope from this sub up to the 260' Sub in the South end of the ore West of the North-South dike was started in August, and after completing the mining of the ore above, sub-level caved the transfer drift on the 200' Sub.

After the failure of the sub-level stope in the ore North of the South dike and East of the North-South dike, it was decided to mine the balance of this area by sub-level caving. This was started on the 200' Sub.

180' - 160' - 140' Subs - South Riser Orebody:

Areas mined on these subs are included in sub-level stopes developed from the 120' Sub. Some exploratory work was done from No. 624 Raise at the elevations of the 160 and 140' Sub-levels to determine the height and extent of the ore in that territory. In November, a start was made to develop a sub-level stope from the 140' Sub up to the 260' Sub in the ore West of the North-South dike. At the end of the year a transfer drift on the 140' Sub for this stope had been advanced 175 feet Northerly from No. 607 Raise.

120' Sub - South Riser Orebody:

This is the sub on which are located the transfer drifts for sub-level stopes, one in the South end of the ore West of the North-South dike and the other for the stope which failed in the ore North of the South dike and East of the North-South dike.

7. UNDERGROUND: (CONT.)

c. **Stoping:** (Cont.)

(2) Detail of Stoping: (Cont.)

Sixth Level:

There was no mining done on the Sixth Level in 1946. The only work done on the level for the year was the drifting of 30 feet in rock to make a connection from the top of a raise put up from the 25' Sub to the end of the South haulage drift on the Sixth Level, this for ventilation and travelling purposes. Other work appearing on the Sixth Level is a dog-drift connecting mills in the development of a sub-level stope in a chimney of ore located between the Main Deposit and the South Riser Orebody.

90' Sub - West Deposit:

Development of this sub for sub-level caving was started in May 1945. Two gangs have been employed here ever since it was started. This sub will be completed within two or three months. It will also be noted that all ore mined on the Cambria Lease during 1946 came from this sub.

50' Sub - Main Deposit:

Mining on this sub was started in May 1945, and at the end of 1946 there were still three gangs working in this area, one slicing, one developing for sub-level caving and one developing for a sub-level stope. The gang developing for a sub-level stope drifted 95 feet South from No. 713 Raise, mostly in jasper, for a transfer drift and is at present developing up to the floor of the Sixth Level, above which this chimney of ore had been mined in 1944. The gang developing for sub-level caving is working in a portion of the large pillar that was held in reserve to support the Sixth Level haulage drift and the Northern extension of the South Riser Orebody. The mining of the South Riser has progressed to a point where it was safe to mine a portion of the pillar, leaving enough to support the Sixth Level.

The East 100-feet of the pillar is now being developed for sub-level caving. The first development was the putting up of a raise, No. 709, from the Seventh Level and drifting over from the top to connect to No. 711 Raise. This, and also a drift due North to the footwall, has been completed and a slice is now being advanced Northeasterly to the footwall.

35' Sub - Main Deposit:

Mining in this area was started in June, and at the end of the year there were two gangs top-slicing. It will be noted that the footwall to the North and West of this deposit is flattening and throwing in, very rapidly decreasing the area of ore on this sub as compared with the area that was mined above.

35' Sub - Southwest Deposit:

Mining in this area, which was started in July 1944, was completed in June of this year. There was nothing unusual about this sub except that it was all mined by top-slicing and that the area of ore at this elevation was slightly larger than on the previous sub.

7. UNDERGROUND: (CONT.)

c. Stoping: (Cont.)

(2) Detail of Stoping: (Cont.)

25' Sub - East Riser:

This sub was started in May 1945 and completed in January 1946. This sub, like the one above, was mined to the limit of the East side of the pillar being retained to support the Sixth Level haulage drift. All mining in this territory was by the top-slicing system.

25' Sub - Southwest Deposit:

A little mining was done in 1944 in the Southwest corner of this deposit, but was abandoned at that time due to the fact that the raise was surrounded by jasper and the elevation of the sub in that particular location was too close to the hanging. Mining of the territory corresponding to the area above was started in May 1945, and at the end of 1946 there were two gangs top-slicing on this sub. In sub-level caving on the 00' Sub, an area of ore occurring to the South of the regular area under an irregular hanging extending above the elevation of the floor of the 25' Sub was mined. To ventilate the working places along the Southern line of raises a drift was advanced 158 feet East from No. 730 Raise, mostly in jasper, from the breast of which a raise was put up to the Sixth Level. The ore area on the 25' Sub is much larger than on the previous sub, extending further South and East.

25' Sub - East Riser:

The mining of this sub by top-slicing was started in May 1945, and completed in January 1946.

10' Sub - East Riser:

Work on this sub was started in January and completed in October, and was mined by top-slicing. This area should properly be called a part of the Main Deposit, as at some point just a short distance below the Sixth Level it connects with the Main Orebody. The portion mined extends from the East line of the pillar held in reserve to support the Sixth Level haulage drift to the East end of the orebody.

10' Sub - Southwest Deposit:

Ore mined at the elevation of the 10' Sub is that extracted by sub-level caving on the 00' Sub.

00' Sub - East Riser or Main Deposit:

Work at this elevation was started in November, and at the end of the year a drift had been advanced from the East line of the aforementioned pillar to the extreme East end of the orebody.

00' Sub - Southwest Deposit:

The development of this sub for sub-level caving was started in October, and at the end of the year there were four gangs working in this area. From present indications the ore area on this sub will be much larger than on the sub above, and it is probable that at this elevation it will connect to the Main Deposit to the Northeast.

7. UNDERGROUND: (CONT.)

c. Stoping: (Cont.)

(2) Detail of Stoping: (Cont.)

-25' Sub - Southwest Deposit:

The only work done on this sub was drifting East and West connecting the North line of raises, and drifting due South from this drift to connect with No. 730 Raise. The East-West drift will serve as a transfer for the sub-level caving above, mills being put up to that elevation. This drifting was started in November, and the process of putting up mills has been started. One gang is employed on this sub.

d. Timbering:

There was much more timbering and repairing required during 1946 than in 1945. It seems that during the strike period when the mine was idle the timber decay was very rapid, due to reduced ventilation and to the fact that the motor trains which stir up the air were not in operation. During this period a considerable amount of timbering was done by the shift bosses.

Statement of Timber Used:

| | Lineal Feet | | Average Price per Foot | | Amount | Amount |
|---|---|---|---|---|---|---|
| | 1946 | 1945 | 1946 | 1945 | 1946 | 1945 |
| 8" Stulls | 21,491 | 26,855 | .0997 | .0905 | 2,141.82 | 2,429.42 |
| 10" Stulls | 42,489 | 42,038 | .1500 | .1310 | 6,372.16 | 5,507.42 |
| 12" Stulls | 12,080 | 24,083 | .2101 | .1774 | 2,538.39 | 4,273.42 |
| Total | 76,060 | 92,976 | .1453 | .1313 | 11,052.37 | 12,210.26 |
| Hardwood Cribbing | 2,583 | 3,309 | .0338 | .0360 | 87.20 | 119.12 |
| 6" Cribbing | 25,297 | 31,883 | .0599 | .0560 | 1,516.48 | 1,786.13 |
| Lagging - 7' | 599,541 | 555,935 | .0140 | .0138 | 8,405.61 | 7,693.50 |
| Poles - 9½' | 473,125 | 558,074 | .0227 | .0210 | 10,720.66 | 11,698.69 |
| Total | 1,100,546 | 1,149,201 | .0188 | .0185 | 20,729.95 | 21,297.44 |
| Wire Fencing - Feet | | 495 | | .0633 | | 31.32 |
| Grand Total | | | | | 31,782.32 | 33,539.02 |

| | 1946 | 1945 |
|---|---|---|
| Product | 296,660 | 315,514 |
| Feet of Timber per Ton of Ore | .256 | .294 |
| Feet of Cribbing per Ton of Ore | .094 | .112 |
| Feet of Lagging per Ton of Ore | 2.021 | 1.762 |
| Feet of Wire Fencing per Ton of Ore | | .0016 |
| Cost per Ton for Timber | .0373 | .0387 |
| Cost per Ton for Cribbing | .0054 | .0060 |
| Cost per Ton for Lagging | .0283 | .0244 |
| Cost per Ton for Wire Fencing | | .0001 |
| Cost per Ton for Poles | .0361 | .0371 |
| Total Cost per Ton | .1071 | .1063 |

Much less timber was used in 1946 than in 1945 due to changing the system of mining in several places from top-slicing to sub-level caving. Mining by the sub-level caving system requires only about 20 to 25% of that used in top-slicing.

In spite of the fact that less timber was used, the cost per ton for timber showed a slight increase due to the rise in prices.

7. UNDERGROUND: (CONT.)

e. Drifting and Raising:

The following table gives a comparison of total feet of drifting and raising in ore and rock in 1946 and 1945:

| | Drifting | | Raising | | |
|---|---|---|---|---|---|
| Year | Ore | Rock | Ore | Rock | Grand Total |
| 1946 | 896' | 992' | 269' | 538' | 2,695' |
| 1945 | 79' | 384' | 473' | 143' | 1,079' |
| Increase | 817' | 608' | | 395' | 1,820' |
| Decrease | | | 204' | | |

The increase is due to the extension of the Seventh Level footwall drift, one cross-cut through ore encountered in footwall drift and the extension of the Seventh Level South haulage drift West to ore shown in underground Diamond Drill Hole No. 163.

f. Explosives, Drilling and Blasting:

Strict supervision of blasting practices and the use of explosives was exercised during 1946.

The breakage of drill steel was considerable due to the hardness of the ore, which in many instances had to be drilled with jackbits.

| Year | Cost per Lb. for Powder | Lbs. Powder per Ton of Ore | Cost per Ton for Powder | Cost per Ton Fuse & Caps | Cost per Ton Total |
|---|---|---|---|---|---|
| 1946 | .1232 | .4197 | .0517 | .0099 | .0616 |
| 1945 | .1150 | .4120 | .0474 | .0092 | .0566 |

Statement of Explosives Used: (Ore Development and Stoping)

| | Quantity | Average Price | Amount 1946 | Amount 1945 |
|---|---|---|---|---|
| Gelamite #1 - Lbs. | 27,680 | 11.50 | 3,183.21 | 14,947.72 |
| Hercomite #2X - Lbs. | 96,826 | 12.55 | 12,153.42 | |
| Total Powder | 124,506 | 12.32 | 15,336.63 | 14,947.72 |
| Electric Detonators | | | | 36.17 |
| Connecting Wire | | | | 2.20 |
| Tamping Bags | 2,500 | 5.00 | 12.50 | |
| Fuse - Feet | 372,823 | 5.58 | 2,080.97 | 2,081.38 |
| Caps - #6 | 57,516 | 12.52 | 720.18 | 699.68 |
| Fuse Lighters - Hot Wire | 17,500 | 6.75 | 118.16 | 84.40 |
| Total Fuse, Etc. | | | 2,931.81 | 2,903.83 |
| Total All Explosives Stoping, Etc. | | | 18,268.44 | 17,851.55 |
| Product | | | 296,660 | 315,514 |
| Pounds of Powder per Ton of Ore | | | .4197 | .4120 |
| Cost per Ton for Powder | | | .0517 | .0474 |
| Cost per Ton for Fuse, Caps, Etc. | | | .0099 | .0092 |
| Cost per Ton for All Explosives | | | .0616 | .0566 |

Statement of Explosives Used: (Sinking, Rock Development, Etc.)

| | | | | |
|---|---|---|---|---|
| Gelamite #1 - Lbs. | 270 | 11.50 | 31.05 | 311.65 |
| 60% Gelatin - Lbs. | 3,315 | 11.50 | 381.25 | 192.63 |
| Hercomite #2X - Lbs. | 9,174 | 12.55 | 1,151.56 | |
| Total Powder | 12,759 | 12.26 | 1,563.86 | 504.28 |
| Fuse - Feet | 29,502 | 5.58 | 164.67 | 52.31 |
| Caps - #6 | 4,203 | 12.52 | 52.63 | 17.58 |
| Fuse Lighters - Hot Wire | 2,500 | 6.75 | 16.88 | |
| Electric Detonators | | | | 10.16 |
| Total Fuse, Etc. | | | 234.18 | 80.05 |
| Total All Explosives Rock Development, Etc. | | | 1,798.04 | 584.33 |
| Total All Explosives Used in Mine | | | 20,066.48 | 18,435.88 |
| Average Price per Pound for Powder | | | .1232 | .1150 |
| Explosives Charged to Idle Expense (March) | | | 2.45* | |

*Included above.

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

7. UNDERGROUND: (CONT.)

f. Explosives, Drilling and Blasting: (Cont.)

Increase in cost is due to rise in prices of explosives.

Increase in consumption due to more development in 1946 than in 1945.

g. Mining and Loading:

On December 31st, 1946 the mine was being operated with 21 gangs of miners as compared with 17 on December 31st, 1945, an increase of 4. This increase consisted of the addition of 3 gangs for development work and one for mining. Mining is gradually being converted from top-slicing to sub-level caving, and some sub-level stoping where conditions are favorable. The number of gangs sub-level caving was increased from 6 to 9 during the year, and at the close of the year two gangs were sub-level stoping and two developing for sub-level stopes. It now seems probable that within the next six months all top-slicing will have been eliminated. This change in method of mining will increase production and lower costs but it must be expected that the grade of ore will be lowered to some extent, as it is impossible to mine on this system without some contamination.

h. Ventilation:

Good ventilation has been maintained throughout the year. To do this, several drifts and raises were put in throughout the entire mining areas.

One gang of repair men was employed almost constantly the entire year to repair and keep open the main Sixth Level drift through which the fresh air is drawn from open caves to the West.

A new 25-horsepower Sturtevant fan was purchased during the year and put in operation to ventilate the advancing of the Seventh Level footwall drift.

i. Pumping:

The number of gallons pumped per minute in each month of the year for the past seven years is shown in the following statement:

| Month | 1946 | 1945 | 1944 | 1943 | 1942 | 1941 | 1940 |
|---|---|---|---|---|---|---|---|
| January | 285 | 317 | 333 | 369 | 413 | 374 | 332 |
| February | 293 | 284 | 285 | 340 | 387 | 342 | 326 |
| March | 309 | 315 | 328 | 335 | 375 | 340 | 309 |
| April | 396 | 456 | 344 | 433 | 430 | 392 | 330 |
| May | 362 | 460 | 425 | 619 | 477 | 435 | 555 |
| June | 314 | 453 | 389 | 620 | 465 | 424 | 540 |
| July | 308 | 439 | 378 | 583 | 421 | 407 | 513 |
| August | 289 | 374 | 347 | 411 | 379 | 390 | 481 |
| September | 272 | 341 | 410 | 395 | 362 | 382 | 461 |
| October | 255 | 315 | 408 | 402 | 391 | 386 | 431 |
| November | 250 | 299 | 423 | 340 | 394 | 419 | 400 |
| December | 276 | 292 | 397 | 340 | 386 | 459 | 374 |
| Average Gallons per Minute | 301 | 363 | 372 | 432 | 407 | 396 | 421 |

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

7. UNDERGROUND: (CONT.)

i. Pumping: (Cont.)

Figures previous to June, 1943, were taken from Republic Steel Corporation records.

The decrease of water pumped in 1946 is mostly due to the unusually small amount of precipitation during the year.

A new six-inch discharge line was installed from the Seventh Level pumproom to the 4th Level and connected to the new Gould vertical triplex pump which was erected and lined up at the end of last year.

The old Aldrich pump was removed and junked and foundations put in for the 5" x 18" Prescott pump purchased on E. & A. No. CC-161 from the Holmes Mine of the Oliver Iron Mining Company. The pump has been taken underground, but is not completely erected due to slow delivery of some parts that must be renewed.

j. Underground in General:

The underground workings of the mine are in very good condition, as is also all equipment. The sixteen new 65 cubic-foot cars purchased on E. & A. No. CC-151 were received and taken underground during the strike period and all the old cars, which were gone beyond repair, were taken up. Also, during the strike, all raise chutes were cut to make headroom for the passage of the new cars, which are much larger than the old ones.

8. COST OF OPERATING:

a. Comparative Mining Costs:

| | 1946 | 1945 | Increase | Decrease |
|---|---|---|---|---|
| Product | 296,660 | 315,514 | | 18,854 |
| Underground Costs | 1.693 | 1.630 | .063 | |
| Surface Costs | .243 | .251 | | .008 |
| General Mine Expense | .304 | .320 | | .016 |
| Cost of Production | 2.240 | 2.201 | .039 | |
| Taxes | .131 | .162 | | .031 |
| Depletion and Depreciation | .092 | .071 | .021 | |
| Loading and Shipping | .038 | .041 | | .003 |
| Total Cost | 2.501 | 2.475 | .026 | |
| No. of Days Operated | 218 | 299 | | 81 |
| Total No. of Shifts Operated | 425 | 541 | | 116 |
| Average Daily Product | 1,361 | 1,055 | 306 | |

Cost of Production:

| | 1946 | Percent | 1945 | Percent | Increase | Decrease |
|---|---|---|---|---|---|---|
| Labor | 1.647 | 65.9 | 1.479 | 59.8 | .168 | |
| Supplies | .854 | 34.1 | .996 | 40.2 | | .142 |
| Total | 2.501 | 100.0 | 2.475 | 100.0 | .026 | |

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

8. COST OF OPERATING: (CONT.)

b. Detailed Cost Comparison:

(1) Days and Shifts:

| Year | Days Mine Worked | Shifts & Hours | Men Employed | Total Shifts |
|---|---|---|---|---|
| 1946 | 218 | 425 - 8 Hr. | 203½ | 44,408¼ |
| 1945 | 299 | 541 - 8 Hr. | 183 | 52,137 |
| Increase | | | 20½ | |
| Decrease | 81 | 116 | | 7,728¾ |

(2) Wages:

An increase of 18½ cents per hour was granted, in settlement of strike, effective May 22nd, 1946. This, together with the fact that the Cambria-Jackson changed the working schedule in June from eleven to twelve shifts per week, the additional shift being paid overtime, caused a considerable increase in wages in 1946.

(3) Comparison of Production:

| | |
|---|---|
| Production - 1946 | 296,660 Tons |
| Production - 1945 | 315,514 Tons |
| Decrease | 18,854 Tons |

(4) Comparison of Number of Men and Wages:

| Year | No. of Men | No. of Days | Amount | Rate per Day |
|---|---|---|---|---|
| 1946 | 203½ | 44,408¼ | 455,363.09 | 10.25 |
| 1945 | 183 | 52,137 | 443,970.06 | 8.52 |
| Increase | 20½ | | 11,393.03 | 1.73 |
| Decrease | | 7,728¾ | | |

(5) Tons per Man per Day:

| | 1946 | 1945 | Increase |
|---|---|---|---|
| Surface | 25.74 | 20.83 | 4.91 |
| Underground | 9.50 | 8.53 | .97 |
| Total | 6.94 | 6.05 | .89 |

(6) Cost of Production:

| | | | |
|---|---|---|---|
| 1946 | $ 664,579.50 | Cost per Ton | $ 2.240 |
| 1945 | $ 694,576.84 | Cost per Ton | $ 2.201 |
| Increase | | | $ .039 |
| Decrease | $ 29,997.34 | | |

| | Labor | Percent | Supplies | Percent |
|---|---|---|---|---|
| 1946 | $ 481,290.48 | 72.4 | $ 183,289.02 | 27.6 |
| 1945 | $ 459,011.81 | 66.1 | $ 235,565.03 | 33.9 |
| Increase | $ 22,278.67 | 6.3 | | |
| Decrease | | | $ 52,276.01 | 6.3 |

The increase in percentage of labor was due to charging a larger proportion of General Mine Expense items to Labor previously charged to Supplies, increase in Vacation Pay $4,258.12, and increase in wages.

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

8. COST OF OPERATING: (CONT.)

b. Detailed Cost Comparison: (Cont.)

(7) Detail of Accounts:

| | 1946 | | 1945 | |
|---|---|---|---|---|
| Days per Week | 6 | | 5½ | |
| Shifts and Hours | 1-8 11<br>2-8 207 | | 1-8 57<br>2-8 242 | |
| Production, Tons | 296,660 | | 315,514 | |
| Average Daily Production, Tons | 1,361 | | 1,055 | |
| Number of Days Worked | 218 | | 299 | |
| UNDERGROUND COSTS: | Amt. | Per Ton | Amt. | Per Ton |
| 1. Exploring in Mine | 5,263.11 | .018 | 15,817.21 | .050 |
| 2. Sinking in Shaft | | | | |
| 3. Development in Rock | 20,478.46 | .069 | 5,143.48 | .017 |
| 4. Development in Ore | 17,340.52 | .058 | 5,112.10 | .016 |
| 5. Stoping | 161,250.17 | .544 | 178,586.67 | .566 |
| 6. Timbering | 139,496.96 | .470 | 139,668.64 | .443 |
| 7. Tramming | 68,588.33 | .231 | 57,784.70 | .183 |
| 8. Ventilation | 4,809.57 | .016 | 4,506.20 | .014 |
| 9. Pumping | 18,003.41 | .061 | 27,567.92 | .087 |
| 10. Compressors and Air Pipes | 18,943.72 | .064 | 22,273.69 | .071 |
| 11. Back Filling | | | | |
| 12. Underground Superintendence | 13,742.59 | .046 | 15,482.09 | .049 |
| 13. Cave-in | 493.33 | .002 | 54.40 | |
| 14. Maint: Compressors and Power Drills | 3,289.33 | .011 | 2,318.02 | .007 |
| 15. Scrapers & Mechanical Loaders | 16,304.57 | .055 | 6,861.65 | .022 |
| 16. Electric Tram Equipment | 12,806.45 | .043 | 25,617.92 | .081 |
| 17. Pumping Machinery | 1,531.45 | .005 | 7,389.46 | .024 |
| Total Underground Costs | 502,341.97 | 1.693 | 514,184.15 | 1.630 |
| SURFACE COSTS: | | | | |
| 18. Hoisting | 19,593.89 | .066 | 21,134.48 | .067 |
| 19. Stocking Ore | 10,920.86 | .037 | 9,874.31 | .031 |
| 20. Screening - Crushing at Mine | | | | |
| 21. Dry House | 5,957.24 | .020 | 8,577.26 | .027 |
| 22. General Surface Expense | 18,212.02 | .061 | 12,507.75 | .040 |
| 23. Maint: Hoisting Equipment | 10,486.19 | .035 | 18,425.69 | .059 |
| 24. Shaft | 1,197.21 | .004 | 2,005.20 | .006 |
| 25. Top Tram Equipment | 2,916.33 | .010 | 3,914.14 | .012 |
| 26. Docks, Trestles & Pockets | 442.96 | .002 | 1,642.35 | .005 |
| 27. Mine Buildings | 2,220.14 | .008 | 1,212.79 | .004 |
| Total Surface Costs | 71,946.84 | .243 | 79,293.97 | .251 |
| GENERAL MINE EXPENSES: | | | | |
| Supply Inventory Adjustment | 707.81 | .002 | 310.55 | .001 |
| Group Annuity Premiums | 561.92 | .002 | 812.84 | .003 |
| 28. Insurance | 2,471.52 | .008 | 2,599.12 | .008 |
| 29. Mining Engineering | 3,977.99 | .013 | 3,232.11 | .010 |
| 30. Mechanical & Electrical Engineering | 1,598.17 | .005 | 2,335.75 | .007 |
| 31. Analysis and Grading | 8,218.09 | .028 | 11,838.98 | .038 |
| 32. Personal Injury | 6,908.19 | .023 | 11,035.80 | .035 |
| 33. Safety Department | 1,359.55 | .005 | 1,226.13 | .004 |
| 34. Telephones and Safety Devices | 2,700.21 | .009 | 4,064.60 | .013 |
| 35. Local and General Welfare | 1,979.26 | .007 | 2,299.59 | .007 |
| 36. Spec. Exp., Pensions & Allowances | 3,370.66 | .011 | 4,546.19 | .014 |
| 37. Ishpeming Office | 12,504.21 | .042 | 12,536.64 | .040 |
| Employees Vacation Pay | 17,609.85 | .060 | 15,255.40 | .048 |
| 38. Social Security Taxes | 9,855.18 | .033 | 9,914.51 | .031 |
| 39. Mine Office | 16,468.08 | .056 | 19,090.51 | .061 |
| Total General Mine Expenses | 90,290.69 | .304 | 101,098.72 | .320 |
| COST OF PRODUCTION | 664,579.50 | 2.240 | 694,576.84 | 2.201 |

8. COST OF OPERATING: (CONT.)

b. Detailed Cost Comparison: (Cont.)

(7) Detail of Accounts: (Cont.)

UNDERGROUND COSTS:

1. Exploring in Mine:

Decrease due to less diamond drilling. There was 1,187 feet of drilling in 1946, as compared with 3,265 feet in 1945.

3. Development in Rock:

Increase due to extension of Seventh Level haulage drifts.

4. Development in Ore:

Increase due to extension of Seventh Level haulage drift.

5. Stoping:

Decrease due to change to more sub-level caving and sub-level stoping.

6. Timbering:

Increase due to higher cost of mine timber, and increased daily production.

7. Tramming:

Increase due to higher labor costs and increased production.

8. Ventilation:

Increase due to purchase of 2 Fans from Princeton Mine, $330.00; and one new Sturtevant Fan, $788.72.

9. Pumping:

| | Total Gallons Pumped | Gallons per Minute |
|---|---|---|
| Year 1946 (Operating Period) | 108,148,315 | 276 |
| Year 1945 | 190,160,114 | 363 |

10. Compressors and Air Pipes:

Decrease due to increased daily production.

11. Back Filling:

There was no back filling in 1946.

12. Underground Superintendence:

Decrease due to increased production.

13. Cave-In:

Increase due to a portion of the fencing of caved area being charged to this account.

14. Compressors and Power Drills:

Increase due to purchase of 4 Pickhamers, $498.76; compressor parts, $1,403.57; and 5 RB-12 Jackhamers from Princeton Mine, $500.00.

8. COST OF OPERATING: (CONT.)

b. Detailed Cost Comparison: (Cont.)

(7) Detail of Accounts: (Cont.)

UNDERGROUND COSTS: (CONT.)

15. Scrapers and Mechanical Loaders:

Increase due to purchase of 4 scraper hoists, $2,850.72.

16. Electric Tram Equipment:

Less repairs to haulage motors and a credit of $1,151.50 for depreciation on tram cars.

17. Pumping Machinery:

Decrease due to charging off proportion of E. & A. No. CC-141, $4,569.38 in 1945; also less repairs to pumps.

SURFACE COSTS:

18. Hoisting:

Small decrease due to increased production.

19. Stocking Ore:

Increase due to stocking more ore, requiring more trestle.

21. Dry House:

Decrease due to less coal consumed by heating plant.

22. General Surface Expense:

Increase due to surface improvements, including new road, $835.79; sidewalks, $262.86; fencing, $744.89; and increased labor costs.

23. Hoisting Equipment:

The large decrease was due to the fact that charges to this account in 1945 were abnormally high.

24. Shaft:

Slight decrease in cost per ton due to larger product.

25. Top Tram Equipment:

No extraordinary charges to this account. Decrease in cost per ton due to increased production.

26. Docks, Trestles and Pockets:

Decrease due to no extraordinary charges to this account in 1946, as compared to a new rock trestle in 1945.

27. Mine Buildings:

Increase due to repairing and painting Office and Dry buildings.

8. COST OF OPERATING: (CONT.)

b. Detailed Cost Comparison: (Cont.)

(7) Detail of Accounts: (Cont.)

GENERAL MINE EXPENSES:

28. Insurance:

The cost per ton was the same for both years.

29. Mining Engineering:

Slight increase for 1946.

30. Mechanical and Electrical Engineering:

The expense in this account was incurred by men in these two departments who inspected equipment on surface and underground and supervised installations and repairs.

31. Analysis and Grading:

The cost to this account is made up as follows:

| | Sampling at Mine | Central Laboratory | Shipping Dept. Expense | Trucking Samples, Etc. | Retro-active |
|---|---|---|---|---|---|
| 1946 | 436.94 | 5647.77 | 1620.73 | 512.65 | None |
| 1945 | 444.73 | 9181.24 | 1659.22 | 547.54 | 6.25 |
| Decrease | 7.79 | 3533.47 | 38.49 | 34.89 | 6.25 |

32. Personal Injury:

The detail of charges to this account were as follows:

| | Compensation & Doctors | Compensation Department |
|---|---|---|
| 1946 | 6442.58 | 465.61 |
| 1945 | 10652.86 | 382.94 |
| Increase | | 82.67 |
| Decrease | 4210.28 | |

33. Safety Department:

A slight increase in costs to this account in 1946.

34. Telephones and Safety Devices:

The detail of charges to this account were as follows:

| | 1946 | 1945 | Increase | Decrease |
|---|---|---|---|---|
| Lights for Shafts and Levels | 1978.86 | 2997.36 | | 1018.50 |
| Mine Telephones | 69.60 | 58.86 | 10.74 | |
| Safety Appliances | 650.07 | 945.46 | | 295.39 |
| Fire Equipment | 1.68 | 45.75 | | 44.07 |
| Retroactive Pay | | 17.17 | | 17.17 |
| Total | 2700.21 | 4064.60 | | 1364.39 |

35. Local and General Welfare:

The detail of charges to this account were as follows:

| | 1946 | 1945 | Decrease |
|---|---|---|---|
| General Welfare | 1568.62 | 1877.29 | 308.67 |
| District Welfare | 410.64 | 422.30 | 11.66 |

8. COST OF OPERATING: (CONT.)

b. Detailed Cost Comparison: (Cont.)

(7) Detail of Accounts: (Cont.)

GENERAL MINE EXPENSES: (CONT.)

36. Special Expense, Pensions and Allowances:

The detail of charges are as follows:

| | 1946 | 1945 | Increase | Decrease |
|---|---|---|---|---|
| Pensions | 379.20 | 560.93 | | 181.73 |
| Legal | 258.35 | 233.10 | 25.25 | |
| Retirement Expense | 1879.20 | 1795.89 | 83.31 | |
| Examinations | 208.59 | 1136.88 | | 928.29 |
| Weekly Wage Record | 175.50 | 319.55 | | 144.05 |
| Other Expenses | 469.82 | 499.84 | ____ | 30.02 |
| Total | 3370.66 | 4546.19 | | 1175.53 |

37. Ishpeming Office:

| | | |
|---|---|---|
| 1946 | $ 12,504.21 | Cost per Ton .042 |
| 1945 | 12,536.64 | Cost per Ton .040 |

Vacation Pay:

| | | |
|---|---|---|
| 1946 | $ 17,609.85 | Cost per Ton .060 |
| 1945 | 15,255.40 | Cost per Ton .048 |

38. Social Security Taxes:

The detailed charges in this account were as follows:

| | Unemployment Tax | Old Age Benefit Tax |
|---|---|---|
| 1946 | $ 5,570.22 | $ 4,284.96 |
| 1945 | 5,603.78 | 4,310.73 |
| Decrease | 33.56 | 25.77 |

39. Mine Office:

The detail of charges to this account were as follows:

| | Salaries Supt. & Clerks | Central Warehouse | Miscellaneous | Total |
|---|---|---|---|---|
| 1946 | $ 12,565.62 | $ 3,188.24 | $ 714.22 | $ 16,468.08 |
| 1945 | 13,657.42 | 4,016.71 | 1,416.38 | 19,090.51 |
| Decrease | 1,091.80 | 828.47 | 702.16 | 2,622.43 |

Supply Inventory Adjustment:

| | | |
|---|---|---|
| 1946 | $ 707.81 | Cost per Ton .002 |
| 1945 | 310.55 | Cost per Ton .001 |

Group Annuity Premiums:

| | | |
|---|---|---|
| 1946 | $ 561.92 | Cost per Ton .002 |
| 1945 | 812.84 | Cost per Ton .003 |

It will be noted that the above statement on the cost of operating in 1946 is compiled from the actual operating time, which was approximately 8½ months. Therefore, the total amount of money expended in each account for the two years does not produce a ready comparison, as does the cost per ton.

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

8. COST OF OPERATING: (CONT.)

c. Cost of Idle Period (Strike):

| | Labor | Supplies | Total |
|---|---|---|---|
| UNDERGROUND COSTS: | | | |
| 1. Exploring in Mine | 370.83 | 83.70 | 454.53 |
| 5. Stoping | 285.40 | 120.90 | 406.30 |
| 6. Timbering | 1,262.79 | 200.56 | 1,463.35 |
| 7. Tramming | 828.03 | 251.14 | 1,079.17 |
| 8. Ventilation | 8.28 | 254.63 | 262.91 |
| 9. Pumping | 3,298.94 | 5,018.13 | 8,317.07 |
| 10. Compressors and Air Pipes | 382.89 | 1,264.94 | 1,647.83 |
| 12. Underground Superintendence | 4,303.26 | 7.62 | 4,310.88 |
| 14. Maint: Compressors & Power Drills | 1.79 | .44 | 2.23 |
| 15. Scrapers & Mechanical Loaders | 387.30 | 294.19 | 681.49 |
| 16. Electric Tram Equipment | 529.08 | 457.54 | 986.62 |
| 17. Pumping Machinery | 383.94 | 113.77 | 497.71 |
| Total Underground Costs | 12,042.53 | 8,067.56 | 20,110.09 |
| SURFACE COSTS: | | | |
| 18. Hoisting | 2,057.76 | 982.06 | 3,039.82 |
| 19. Stocking Ore | 35.44 | 142.46 | 177.90 |
| 21. Dry House | 1,075.57 | 1,015.36 | 2,090.93 |
| 22. General Surface Expense | 3,040.76 | 195.06 | 3,235.82 |
| 23. Maint: Hoisting Equipment | 155.00 | 1,060.05 | 1,215.05 |
| 24. Shaft | 21.41 | 100.11 | 121.52 |
| 25. Top Tram Equipment | 57.49 | 86.81 | 144.30 |
| 27. Mine Buildings | 116.54 | 75.54 | 192.08 |
| Total Surface Costs | 6,559.97 | 3,657.45 | 10,217.42 |
| GENERAL MINE EXPENSES: | | | |
| Group Annuity Premiums | | 225.30 | 225.30 |
| 28. Insurance | | 821.27 | 821.27 |
| 29. Mining Engineering | 1,211.23 | 255.90 | 1,467.13 |
| 30. Mechanical & Electrical Engineering | 306.40 | 287.00 | 593.40 |
| 31. Analysis and Grading | 875.28 | 178.04 | 1,053.32 |
| 32. Personal Injury | 129.00 | 605.97 | 734.97 |
| 33. Safety Department | 292.00 | 46.00 | 338.00 |
| 34. Telephones and Safety Devices | 35.96 | 674.46 | 710.42 |
| 35. Local and General Welfare | 262.00 | 343.00 | 605.00 |
| 36. Special Expense, Pensions & Allowances | 302.67 | 891.88 | 1,194.55 |
| 37. Ishpeming Office | 1,947.00 | 1,656.00 | 3,603.00 |
| 38. Social Security Taxes | | 1,234.69 | 1,234.69 |
| Employees Vacation Pay | 4,445.00 | | 4,445.00 |
| 39. Mine Office | 4,662.25 | 807.79 | 5,470.04 |
| Total General Mine Expenses | 14,468.79 | 8,027.30 | 22,496.09 |
| TOTAL | 33,071.29 | 19,752.31 | 52,823.60 |

The above statement is a compilation of the cost of keeping the mine open and ready for operation during the idle period of 88 operating days, or approximately 3½ months, when the employees were out on strike.

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

9. EXPLORATIONS AND FUTURE EXPLORATIONS:

One diamond drill unit using bortz bits was in constant operation until September 1st, during which period five holes were drilled, two on the 5th Level, one on the 90' Sub, one on the Seventh Level and the continuation of one on the Sixth Level.

Holes No. 172 and No. 173, drilled from the 5th Level in the Cambria Lease, were put in to secure more information on the downward extension of ore disclosed in last year's drilling. Neither of these holes encountered any ore, but there is a possibility that the holes were drilled on too steep an incline and that the ore in its downward extension lies above them.

Hole No. 174 was drilled due South from the breast of the drift South of No. 747 Raise on the 90' Sub. This hole was drilled to explore the territory South of the West Deposit and was fruitful in that it disclosed a seam of high class ore, 25 ft. in width, approximately 100 feet Southerly from the West Deposit. In all probability, this ore extends at least 125 feet Easterly to ore shown in underground hole No. 116 drilled vertically from the floor of the Sixth Level, and approximately 180 feet Westerly to the North-South fault line.

Hole No. 175 was drilled Northerly from a point near the end of the then South main haulage drift on the Seventh Level. It was drilled to locate a probable Eastward extension of ore shown in underground hole No. 163, located about 250 feet West of this point, and if the ore did not extend that far East, to locate foot corresponding to that shown in hole No. 163. No ore was encountered in this hole, but after extending the haulage drift West to ore in hole No. 163, it was found that the hole missed the end of the ore by only 25 feet. On the assumption that this is the same seam of ore located by Hole No. 174, it is being developed for sub-level stoping.

Hole No. 169 was started November 17, 1945 from the West end of the 6th Level drift on a course of South 25° West in anticipation of intersecting the upward trend of the ore being mined at the Mather Mine near the West boundary of the Jackson Strip. After drilling 86 feet, the hole was discontinued temporarily to drill a more urgent one on the Fifth Level. Continuation of this hole was started in July of this year and finished on August 30th, which completed drilling operations for the year. No ore was encountered in this hole. The hole was stopped because of the fact that the Seventh Level drift had entered the ore, and it was deemed more economical and satisfactory to explore by developing the ore.

A record of the cost of drilling is given in the following tables, also the log of each hole:

| | | |
|---|---|---|
| Drilling Cost: | Labor | $ 4,569.69 |
| | Supplies & Misc. | 444.51 |
| | Bortz | 638.14 |
| | Total | $ 4,376.06 |
| Overhead Expense: | Analysis | $ 85.17 |
| | Geological Dept. | 381.13 |
| | Total | $ 466.30 |
| Grand Total | | $ 4,842.36 |

| Feet Drilled | Cost per Foot | Total Cost |
|---|---|---|
| 1,187 | $ 4.08 | $ 4,842.36 |

The above is not a true statement as to the cost per foot as the salvage value of a great number of the bortz bits used last year is credited to drilling for 1946. There is still some credit due on bits used this year.

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

9. EXPLORATIONS AND FUTURE EXPLORATIONS: (CONT.)

Logs of Holes Drilled:

| D. D. Hole No. | Location | Dip | Course | Date Started | Date Stopped |
|---|---|---|---|---|---|
| 172 | 5th Level | -61° | S54°30'E | 1-10-46 | 1-25-46 |

Material

0' to 80' - Soft Ore Jasper
80' to 91' - Dike
91' to 103' - Transition Jasper and Slate

| | | | | | |
|---|---|---|---|---|---|
| 173 | 5th Level | -40° | S8°46'W | 1-28-46 | 6-20-46 |

| Material | | Iron | Phos. | Sul. |
|---|---|---|---|---|
| 0' to 30' | - Soft Ore Jasper | | | |
| 30' to 35' | - | 50.13 | .098 | .009 |
| 35' to 45' | - | 56.99 | .149 | .009 |
| 45' to 51' | - Soft Ore Jasper | | | |
| 51' to 54' | - Dike | | | |
| 54' to 115' | - Soft Ore Jasper | | | |
| 115' to 120' | - | 46.60 | .050 | |
| 120' to 215' | - Soft Ore Jasper | | | |
| 215' to 219' | - | 45.01 | .065 | |
| 219' to 224' | - Soft Ore Jasper | | | |
| 224' to 227' | - | 47.70 | .121 | |
| 227' to 254' | - Diabase Dike | | | |
| 254' to 256' | - Soft Ore Jasper | | | |

| | | | | | |
|---|---|---|---|---|---|
| 174 | 90' Sub-Level | ∠5° | Due South | 6-27-46 | 7-5-46 |

| Material | | Iron | Phos. | Sul. |
|---|---|---|---|---|
| 0' to 55' | - Soft Ore Jasper | | | |
| 55' to 80' | - | 60.64 | .112 | .009 |
| 80' to 119' | - Soft Ore Jasper | | | |

| | | | | | |
|---|---|---|---|---|---|
| 175 | 7th Level | ∠1° | N34°28'W | 7-9-46 | 7-12-46 |

Material

0' to 13' - Soft Ore Jasper
13' to 80' - Slate

| | | | | | |
|---|---|---|---|---|---|
| 169 | 6th Level | ∠0°35' | S34°16'W | 7-13-46 | 8-30-46 |

Material

0' to 194' - Slate
194' to 282' - Transition Slate and Jasper
282' to 401' - Soft Ore Jasper
401' to 413' - Dike
413' to 684' - Soft Ore Jasper

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

10. TAXES:

| | 1946 Valuation | 1946 Taxes | 1945 Valuation | 1945 Taxes |
|---|---|---|---|---|
| Cambria Realty: S½ of SE¼ of Sec. 35, 48-27 ) Lots 7 & 8 of Sec. 35, 48-27 ) Lots 5, 6 & 7 of Sec. 36, 48-27) - 222.09 Acres) | 125,000 | 5,517.91 | 125,000 | 5,273.49 |
| Jackson Strip: N 660' of N½ of NW¼ of Sec. 1, 47-27 - 40 Acres) | 805,000 | 35,535.36 | 775,000 | 32,695.62 |
| Personal Property: Stockpile, Supplies & Equipment | 240,000 | 10,594.39 | 280,000 | 11,812.61 |
| Total by Mich. State Tax Com. | 1,170,000 | 51,647.66 | 1,180,000 | 49,781.72 |
| Lillie Mine Location, 1 House - Lot 5 | 100 | 4.41 | 100 | 4.22 |
| Total | 1,170,100 | 51,652.07 | 1,180,100 | 49,785.94 |
| Collection Fees | | 516.52 | | 497.86 |
| Total Taxes, Negaunee | | 52,168.59 | | 50,283.80 |
| Division of Payments: | | | | |
| Cambria-Jackson Taxes, Ishpeming* | 30,000 | 1,077.39 | 20,000 | 718.74 |
| Cambria-Jackson Taxes, Negaunee | 1,170,100 | 52,168.59 | 1,180,100 | 50,283.80 |
| TOTAL | 1,200,100 | 53,245.98 | 1,200,100 | 51,002.54 |

*Cambria-Jackson Mine - Ishpeming:
N 660' of NE¼ of NE¼ of Sec. 2, 47-27 - 20 Acres)

Tax Rate per $100 of Valuation:

| | 1946 | 1945 |
|---|---|---|
| City of Negaunee | 4.41433 | 4.26098 |
| City of Ishpeming | 3.59130 | 3.59370 |

| | | |
|---|---|---|
| Total Taxes, City of Negaunee: | 523,650.90 | 542,465.77 |
| Cambria-Jackson Percent of Taxes: City of Negaunee | 9.96 | 9.27 |

11. ACCIDENTS AND PERSONAL INJURY:

Following is a list of the number of accidents classified as to time lost:

| | 1946 | 1945 |
|---|---|---|
| Fatal | 0 | 0 |
| Time Lost - Over Four Months | 0 | 1 |
| Time Lost - One to Four Months | 5 | 3 |
| Time Lost - Less than One Month | 4 | 5 |
| Total Compensable Accidents | 9 | 9 |

On December 31, 1946 payments were being made on four accidents which occurred prior to January 1st, 1946, one of which is for partial disability.

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

11. ACCIDENTS AND PERSONAL INJURY: (CONT.)

| Accident No. | Date of Accident | Nature of Injury | Days Lost |
|---|---|---|---|
| 34 | 1-29-46 | Fracture 11th rib, left side | 30 |
| 35 | 1-4-46 | Nerve injury, left side of head | 75 |
| 36 | 6-20-46 | Fracture, left little finger | 32 |
| 37 | 7-4-46 | Contusion, right foot | 15 |
| 38 | 8-28-46 | Fracture, small bone in right ankle | 27 |
| 39 | 9-17-46 | Fracture, right thumb | 11 |
| 40 | 9-19-46 | Amputation,3rd&4th fingers,left hand | 90 |
| 41 | 9-23-46 | Lacerated left hand | 17 |
| 42 | 10-3-46 | Fracture, right scapula | 77 |
| | Total Days Lost | | 374 |

12. NEW CONSTRUCTION AND PROPOSED NEW CONSTRUCTION:

a. Engine House:

E. & A. No. CC-152, which was authorized in August, 1945 for the erection of a 24-foot extension to the engine house, the purchase of a 2300 cubic-foot compressor from the Oliver Iron Mining Company and its installation, was completed during the forepart of the year. This E. & A. was overexpended by $2,177.18, due to the fact that the foundations were carried down to the rock ledge which was a little lower than the foundation specifications called for, and to the trouble encountered in reconditioning and erecting the compressor. The installation of this equipment has greatly increased the drilling capacity and other operations using compressed air.

b. Shop Building:

In October, E. & A. No. CC-174 was authorized for the expenditure of $38,740 for the erection of a new shop building to replace the old shops, which are in very bad condition. The expenditure calls for the erection of a concrete block building with concrete floors throughout and a pitched ¼-inch per foot concrete roof covered with insulation and a built-up roofing, installation of sewers, heating and electrical controls, lighting, electric power circuits, revamping present machines and electrical equipment, and the purchase and installation of a new bolt-threading machine and a new drill sharpener and dies. Erection of the building was started on October 24th, and at the end of the year the footings and foundations had been completed and about a third of the concrete blocks erected. The building is being built just South and West of the office building.

13. EQUIPMENT AND PROPOSED EQUIPMENT:

a. Pumps:

E. & A. No. CC-137, authorizing the expenditure of $12,100 for enlarging the Seventh Level pumproom and the purchase and installation of a vertical triplex pump with motor and starting equipment, was completed the early part of the year with an unexpended balance of $90.54.

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

13. EQUIPMENT AND PROPOSED EQUIPMENT: (CONT.)

a. Pumps: (Cont.)

In October, E. & A. No. CC-161 was authorized for the expenditure of $11,550 for the purchase and installation of a 5" x 8" used Prescott pump complete with motor and control, preparing shaft for installation of a new discharge line from the 7th to the 4th Level and installing the line. To date, with an expenditure of $7,698.68, the shaft has been put in condition, the discharge line installed, pump purchased, foundations built and the pump put in place and partially lined. The only work remaining to be done on this project is the final aligning of the pump, making connections to the electrical controls and discharge lines and the laying of a concrete floor in the entire pumproom. This expenditure should come well within the unexpended balance.

b. Shaft Hoist:

E. & A. No. CC-149, which was authorized in April of last year for the expenditure of $4,290 for the purchase and installation of an Auxiliary Brake for the shaft hoist, has been completed with an unexpended balance of $1,219.99.

c. Steam Shovel:

No. 59 Shovel, which is the one that was at the mine when the property was taken over, was brought out to the mine from the General Shops at Ishpeming and used all during the shipping season. The shovel is now stored on the loading track.

d. Scraper Hoists:

Following is a list of scraper hoists at the mine and costs of repairs:

| | | 1946 | | 1945 | |
|---|---|---|---|---|---|
| Company | Total Machines | Total Machines Repaired | Avg. Cost of Ea. Mach. Repaired | Total Machines Repaired | Avg. Cost of Ea. Mach. Repaired |
| Ing.-Rand 15 H.P. Elec. | 15 | 2 | 190.17 | 3 | 180.75 |
| Ing.-Rand 20 H.P. Elec. | 2 | | | 1 | 34.50 |
| Ing.-Rand Air Hoists | 2 | | | | |
| Sullivan 15 H.P. Elec. | 6 | 2 | 305.62 | 5 | 231.04 |
| Sullivan 25 H.P. Elec. | 6 | - | ------ | 2 | 27.42 |
| Total | 31 | 4 | 991.57 | 11 | 1,786.76 |

The above statement shows an increase of three Ingersoll-Rand 15 H.P. Electrics and two air hoists. The three 15 H.P. machines were transferred from the Princeton Mine and the two small double-drum air hoists were purchased new for use with small scrapers in dog-drifting. Not included in this statement are two Ingersoll-Rand 15 H.P. Hoists which were transferred from the Lloyd Mine, but are not as yet billed to the Cambria-Jackson.

Two 25 H.P. Ingersoll-Rand Hoists are on order and should be delivered about April 1st.

13. EQUIPMENT AND PROPOSED EQUIPMENT: (CONT.)

e. Underground Tram Cars:

In May 1945, E. & A. No. CC-151 was authorized for the expenditure of $11,670 for the purchase and installation of 16 - 65 cubic-foot rocker dump cars to replace the 23 - 40 cubic-foot cars which were worn beyond repair. The cars were received in February, just before the strike, and were taken underground during the strike period so that they were in readiness for operation when the mine resumed work. Completion of this E. & A. showed an unexpended balance of $33.41.

Arrangements have been made for the transfer of seven 65 cubic-foot rocker dump cars immediately after the first of the year. These cars, being built for a 30"-gauge track, will have to be rebuilt to fit the 24"-gauge track in use at the Cambria-Jackson. It is estimated that this work will be completed and the cars put into operation some time in January.

f. Timber Hoists:

During 1946, five H. U. Utility Hoists were transferred from the Princeton Mine to the Cambria-Jackson. This increases to 26 the number of these air hoists in use at the present time.

g. Haulage Tracks:

The following is a comparison of costs of materials for haulage tracks for 1946 and 1945:

| | 1946 | 1945 |
|---|---|---|
| 40-Lb. Rail | 570.53 | 774.58 |
| Ties and Tie Plates | 339.69 | 51.02 |
| Total | 910.22 | 825.60 |

Included in above figures are items of 502.66 for rail and 34.03 for ties, etc., which were charged to advancing the 7th Level footwall drift. This charge was made to drifting on the assumption that an E. & A. would be authorized for drifting, but which never materialized.

h. Mine Trucks:

The Cambria-Jackson Mine continues to operate two trucks, one a two-ton 1940 Dodge and the other a one-and-one-half ton 1937 Chevrolet. The mine is still waiting for the delivery of a 1½-ton truck, which was ordered on authorization E. & A. No. CC-162, issued in November 1945. It is hoped that this truck will be delivered soon as there is an urgent need for it.

When the new truck is delivered it is proposed to make a jammer, or hoist, out of the old truck to be used for loading timber and any other heavy materials.

i. Skips and Cages:

In September, a double-deck cage was put in operation in the West shaft compartment to speed up the hoisting of men. This change has saved from 15 to 20 minutes in hoisting time at each change of shifts.

To increase production at the Cambria-Jackson, it has been proposed to increase the size of the hoist motor and to secure new skips and cages, increasing the skip capacity from the present 5 tons to 6 tons. The mechanical department is now designing the new units, which will be of aluminum alloy construction.

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

14. MAINTENANCE AND REPAIRS:

The Maintenance and Repair Costs listed under "Underground Costs" were as follows:

| | 1946 | | 1945 | |
|---|---|---|---|---|
| | Amount | Cost per Ton | Amount | Cost per Ton |
| Compressors & Power Drills | 3,289.33 | .011 | 2,318.02 | .007 |
| Scraper Equipment | 16,304.57 | .055 | 6,861.65 | .022 |
| Electric Tram Equipment | 12,806.45 | .043 | 25,617.92 | .081 |
| Pumping Machinery | 1,531.45 | .005 | 7,389.46 | .024 |
| Total | 33,931.80 | .114 | 42,187.05 | .134 |

The following is a list of purchases and repair costs for 1946 as compared with 1945:

| | 1946 | 1945 |
|---|---|---|
| Worthington Compressor Parts | 1,403.57 | |
| Track Group for Tractor | 565.40 | |
| Paving new Road by City of Negaunee | 835.79 | |
| 1 - 25-H.P. Fan | 788.58 | |
| 2 Double-Drum Air Hoists | 1,350.72 | |
| 4 Pickhamers | 500.65 | |
| 1 - 3-Ton Chain Hoist | 154.80 | |
| 1 Electric Drill | 85.00 | |
| 1 Portable Grinder | 117.60 | |
| 8,500 feet Wire Fencing | 819.66 | |
| 963 Fence Posts | 493.33 | |
| 1 Mine Telephone | 56.54 | |
| 41,712 feet Wire Rope for Scrapers | 4,196.80 | |
| 1 - 25-H.P. D.C. Motor(Used,from Princeton Mine) | 100.00 | |
| 5 Utility Hoists ( " , " " " ) | 1,000.00 | |
| 2 - 5-H.P. Fans ( " , " " " ) | 330.00 | |
| 3 - 15-H.P.Elec.Hoists( " , " " " ) | 2,025.00 | |
| 5 RB-12 Jackhamers ( " , " " " ) | 500.00 | |
| 1 Electric Arc Welder ( " , " " " ) | 75.00 | |
| Total Purchases | 15,398.44 | 7,723.09 |
| Repairs to Compressors & Power Drills | 2,288.68 | |
| Repairs to Scraper Hoists | 8,732.05 | |
| Repairs to Locomotives | 4,638.44 | |
| Repairs to Trolley Wire | 678.25 | |
| Repairs to Tracks | 3,397.89 | |
| Repairs to Cars | 2,616.22 | |
| Repairs to Pumping Machinery | 1,531.45 | |
| Total Repairs | 21,594.30 | 34,811.50 |
| Two new Hoisting Ropes | 2,858.64 | |
| Repairs to Electric Hoists | 836.66 | |
| Repairs to Skips, Cages, Etc. | 6,678.36 | |
| Repairs to Sheaves & Pulley Stands | 64.38 | |
| Repairs to Shaft | 1,197.21 | |
| Repairs to Larry Cars & Tracks | 2,249.50 | |
| Trestle Trolley Line | 666.83 | |
| Repairs to Permanent Trestles | 159.07 | |
| Repairs to Pockets, Chutes, Etc. | 283.89 | |
| Repairs to Mine Buildings | 2,220.14 | |
| Total | 17,214.68 | 26,784.38 |

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

15. POWER:

Following is a detail of electric current purchased in 1946 and 1945, distribution of charges to various accounts, and other data:

| | 1946 | | 1945 | |
|---|---|---|---|---|
| | Cost | Per Ton | Cost | Per Ton |
| Stoping | 1,036.04 | .004 | 1,418.36 | .005 |
| Tramming | 142.81 | .001 | 176.30 | .001 |
| Ventilation | 2,093.29 | .007 | 1,140.22 | .004 |
| Pumping | 12,367.24 | .042 | 14,720.59 | .047 |
| Compressors | 12,082.01 | .041 | 13,701.06 | .043 |
| Hoisting | 11,347.05 | .038 | 10,965.76 | .035 |
| Stocking Ore | 662.93 | .002 | 772.63 | .002 |
| Dry House | 253.67 | .001 | 265.61 | .001 |
| General Surface | 421.54 | .001 | 420.45 | .001 |
| Telephones & Safety Devices | 1,492.50 | .005 | 1,867.06 | .006 |
| Mine Office | 61.66 | .000 | 77.16 | .000 |
| Electric Haulage | 6,580.94 | .022 | 5,761.99 | .018 |
| Shops | 164.21 | .001 | 461.12 | .001 |
| Heating | 82.44 | .000 | 152.23 | .001 |
| Tractor & Truck | 24.05 | .000 | 15.94 | .000 |
| Total | 48,812.48 | .165 | 51,916.48 | .165 |
| Power charged to Idle Exp.* | 7,787.52 | | | |
| *Included above. | | | | |
| Main Line Meter - K. W. | 3,393,600 | | 3,553,600 | |
| Separate Meter Readings | 3,388,484 | | 3,540,030 | |
| Line Loss - K. W. | 5,116 | | 13,570 | |
| Product - Tons | 296,660 | | 315,514 | |
| K.W. per Ton (Inc.Line Loss) | 11.44 | | 11.26 | |
| Cost per K. W. (Average) | .0144 | | .0146 | |
| 15 Min.Demand-K.W.(Average) | 811 | | 913 | |
| Average Load Factor | 46% | | 44% | |

17. CONDITION OF GROUNDS:

Comment has been made elsewhere of the many improvements made on surface. There has been a great improvement in the general appearance of the surface plant, but there is still much work to be done. Work contemplated during 1947 includes painting the engine house and shaft-house, increasing the capacity of the Southeast stocking grounds, removing two unsightly buildings now used for storage, and the planting of lawns and shrubbery.

CAMBRIA-JACKSON MINE
ANNUAL REPORT
YEAR 1946

18. NATIONALITY OF EMPLOYEES:

The nationality record of employees is submitted in two forms, one as to parentage, the other as to country of birth:

| As to Parentage | 1946 | Percent | 1945 | Percent |
|---|---|---|---|---|
| Finnish | 80 | 36.4 | 68 | 36.8 |
| English | 37 | 16.8 | 28 | 15.1 |
| Italian | 33 | 15.0 | 34 | 18.4 |
| Swedish | 28 | 12.7 | 24 | 13.0 |
| French (France) | 11 | 5.0 | 6 | 3.2 |
| French (Canadian) | 9 | 4.1 | 5 | 2.7 |
| Danish | 6 | 2.7 | 6 | 3.2 |
| German | 4 | 1.8 | 4 | 2.2 |
| Irish | 4 | 1.8 | 3 | 1.6 |
| Norwegian | 4 | 1.8 | 4 | 2.2 |
| Austrian | 3 | 1.4 | 3 | 1.6 |
| Lithuanian | 1 | .5 | 0 | 0.0 |
| Total | 220 | 100.0 | 185 | 100.0 |

| | American Born | | Foreign Born | |
|---|---|---|---|---|
| As to Birth | 1946 | 1945 | 1946 | 1945 |
| Finnish | 51 | 39 | 29 | 29 |
| English | 29 | 19 | 8 | 9 |
| Swedish | 25 | 21 | 3 | 3 |
| Italian | 12 | 14 | 21 | 20 |
| French (France) | 11 | 6 | 0 | 0 |
| French (Canadian) | 9 | 5 | 0 | 0 |
| Danish | 6 | 6 | 0 | 0 |
| German | 4 | 4 | 0 | 0 |
| Irish | 4 | 3 | 0 | 0 |
| Norwegian | 2 | 2 | 2 | 2 |
| Austrian | 1 | 1 | 2 | 2 |
| Lithuanian | 1 | 0 | 0 | 0 |
| Total | 155 | 120 | 65 | 65 |
| Percent | 70.5% | 64.9% | 29.5% | 35.1% |

# LUCY MINE
# ANNUAL REPORT
# YEAR 1946

1. GENERAL:

There we re no changes at this idle property during 1946.

6. SURFACE:

The fences around the open pits a nd old abandoned shafts were inspected early in the summer and repairs made where necessary.

10. TAXES:

| | 1946 | | 1945 | |
|---|---|---|---|---|
| | Valuation | Taxes | Valuation | Taxes |
| Various Parcels | 28,120.00 | 1,241.30 | 28,120.00 | 1,186.33 |
| Collection Fees | | 12.42 | | 11.87 |
| Total | 28,120.00 | 1,253.72 | 28,120.00 | 1,198.20 |

Taxes increased due to the higher tax rate in the City of Negaunee.

WRA/jl - 3
6/19/47

# MAAS MINE
# ANNUAL REPORT
# YEAR 1946

## 1. GENERAL

The Maas Mine operated on two 8-hour shifts, six days per week from January 1st to December 31st, except during the period of the strike, which lasted from February 8th to May 21st. On July 15th a small tramming and hoisting crew were placed on the midnight shift and this continued for the balance of the year. After the first of July there was a full crew available as, although a number of men did not return after the strike, there were sufficient returned veterans besides the addition of 20 miners transferred from the Princeton Mine.

During the early days of the strike it was possible to obtain some maintenance men, provided they belonged to the union, to do the necessary repairing in the mine, but after considerable disagreement with the union, these men were called off and only foremen, hoisting engineers, and pumpmen allowed to work. The Company then obtained an injunction prohibiting the picketing and stopping of necessary men and at this time, which was the latter part of March, a considerable number of the other men started to come back to work. These were composed of both union and non-union men who felt that they should have the right to work. Approximately 75 men, or one-fifth of the total employment, worked for three days, during which there were two mass demonstrations, one on a Saturday morning when the men came to work and the other, much larger, on Monday afternoon when the men came off shift. Although there was no violence, due no doubt to the presence of the State Police, this discouraged the men, and further threats of intimidation by outside "goons" decided them to abandon the attempt, and from then on until the end of the strike all the maintenance work in connection with the repairing of timber in drifts was accomplished by the underground foremen and bosses, who were very loyal and worked hard to keep the mine in good shape. In fact, there was only one working place lost, and a full crew were able to start as soon as negotiations permitted. An increase of 18½ cents per hour was granted, and the mine resumed operations on May 22nd.

The total production for the year showed a decrease of approximately 100,000 tons, as compared with 1945, but this was entirely due to being idle during the strike, as the average monthly product was increased by 8,507 tons. The ratio of standard ore to high sulphur ore remained practically the same, with 62.6% of standard grade.

The shipments from the mine were also naturally less in 1946 due to the strike at the mines, and also there were two cancellations of high sulphur tonnage due to strikes elsewhere. Approximately 25% of the ore was too wet to ship directly from the pocket and had to be placed on stockpile to drain.

Mining conditions on the whole were very favorable for good production during 1946, and with the addition of more miners, the production was increased approximately 400 tons per day, which helped materially to decrease the total cost per ton. The pumping remained about the same, and the water continued to be more a source of delay in scraping and hoisting the wet ore, rather than a discomfort to the men, as it consisted for the most part of bottom water. There were a large number of company account men employed on timbering, even though it was possible to abandon the 3rd Level when mining was completed at that elevation. These men were necessary on account of the extensive footage of timbered drifts and cross-cuts on the 4th, 5th and 6th Levels that have to be maintained, besides the repairs to sub levels and raises.

# MAAS MINE
# ANNUAL REPORT
# YEAR 1946

## 1. GENERAL (Cont.)

The sub level caving system of mining was started in the Maas Mine soon after the strike ended and this, together with the sub level stopes has not only increased the tons-per-man but also decreased the timber cost. 90% of the drilling was accomplished with wet machines, using hollow steel and jackbits, and the long holes, 20 to 30', required to break the ore in the stopes and sub caves, were drilled with sectional steel rods threaded for couplers and jackbits. The proportion of special or high sulphur ore was 37.4%, and this should remain practically the same, as the two new 6th Level stopes producing special grade should offset the moving of other contracts from high sulphur to standard areas.

The small amount of development during 1946 consisted of a small footage in the 6700 Cross-Cut on 6th Level and a few raises on 4th Level. It is expected that more work will be necessary next year to open up from the level below two areas that are so close to the present level that it is uneconomical to keep the drifts open for tramming. The ventilation of the 6th Level is not as good as is desired, and a very extensive rock program will have to be started early in 1947 to connect this level with the 14th Level Negaunee Mine.

There were no changes of note on surface, both surface well pumps were in operation the entire year, and there were also no major delays outside of the strike.

It is a pleasure to be able to report that the Maas Mine completed this year without a single fatal accident and only five that caused a loss in time of over one month.

## 2. PRODUCTION, SHIPMENTS & INVENTORIES

### a. Production by Grades

| | 1946 | 1945 |
|---|---|---|
| Maas | 236,004 | 265,217 |
| Maas Special | 109,431 | 131,282 |
| Race Course | 62,301 | 74,073 |
| Race Course Special | 68,612 | 88,061 |
| Total | 476,348 | 558,633 |
| Rock | 11,175 | 17,545 |
| Total Hoist | 487,523 | 576,178 |

### b. Shipments

| Grade of Ore | Pocket Tons | Stockpile Tons | Total Tons | Total Last Year |
|---|---|---|---|---|
| Maas | 125,702 | 93,161 | 218,863 | 224,610 |
| Maas Special | 24,440 | 66,990 | 91,430 | 137,040 |
| Race Course | 34,292 | 23,490 | 57,782 | 65,779 |
| Race Course Special | 21,552 | 51,442 | 72,994 | 94,915 |
| Total | 205,986 | 235,083 | 441,069 | 522,344 |
| Total Last Year | 267,643 | 254,701 | 522,344 | |
| Decrease | 61,657 | 19,618 | 81,275 | |

MAAS MINE
ANNUAL REPORT
YEAR 1946

2. PRODUCTION, SHIPMENTS & INVENTORIES (Cont.)

c. Stockpile Inventories

| Grade of Ore | 12-31-46 | 12-31-45 |
|---|---|---|
| Maas | 78,629 | 61,488 |
| Maas Special | 41,890 | 23,889 |
| Race Course | 21,677 | 17,158 |
| Race Course Special | 12,202 | 16,584 |
| Total | 154,398 | 119,119 |

d. Division of Product by Levels

| | 1946 | % | 1945 | % |
|---|---|---|---|---|
| Third Level | 6,210 | 1.3 | 63,153 | 11.3 |
| Fourth Level | 105,831 | 22.2 | 96,209 | 17.2 |
| Fifth Level | 342,937 | 72.0 | 389,751 | 69.8 |
| Sixth Level | 21,370 | 4.5 | 9,520 | 1.7 |
| Total | 476,348 | 100.0 | 558,633 | 100.0 |

Ore mined on 3rd and 4th Levels was all standard grade.
Ore mined on 5th Level was 46% standard grade.
Ore mined on 6th Level was 95% special grade.

e. Production by Months

| Month | Maas | Maas Spcl. | Race Course | R. C. Spcl. | Total | Rock |
|---|---|---|---|---|---|---|
| January | 23,968 | 14,360 | 7,029 | 4,739 | 50,096 | 1,060 |
| February | 5,776 | 2,673 | 1,205 | 1,485 | 11,139 | 295 |
| March | 925 | 512 | 225 | 17 | 1,679 | 15 |
| April | | | | | 0 | |
| May | 5,483 | 2,464 | 1,977 | 1,433 | 11,357 | 280 |
| June | 25,221 | 9,516 | 6,091 | 9,241 | 50,069 | 1,930 |
| July | 27,103 | 12,651 | 8,481 | 7,969 | 56,204 | 1,945 |
| August | 27,267 | 15,461 | 9,222 | 7,597 | 59,547 | 2,025 |
| September | 27,937 | 13,732 | 7,765 | 10,387 | 59,821 | 830 |
| October | 33,908 | 16,859 | 7,509 | 10,198 | 68,474 | 1,180 |
| November | 26,942 | 12,768 | 6,783 | 9,327 | 55,820 | 440 |
| December | 33,115 | 6,794 | 7,696 | 4,537 | 52,142 | 1,175 |
| Total | 237,645 | 107,790 | 63,983 | 66,930 | 476,348 | 11,175 |
| Transferred To & From | 1,641 | 1,641 | 1,682 | 1,682 | | |
| Gr. Total | 236,004 | 109,431 | 62,301 | 68,612 | 476,348 | |

The product was distributed by leases as follows:

| | 1946 | 1945 |
|---|---|---|
| George Maas Lease | 331,746 | 375,824 |
| Catholic Cemetery Lease | 4,731 | 5,094 |
| Adams Strip or N 1/6 of Rt. of Way | | 2 |
| C.C.I. Co. or N 1/3 of Rt. of Way | 737 | 480 |
| Race Course Lease | 130,913 | 164,461 |
| Baldwin Kiln Road Lease | 8,221 | 17,427 |
| Total | 476,348 | 563,288 |

MAAS MINE
ANNUAL REPORT
YEAR 1946

## 2. PRODUCTION, SHIPMENTS & INVENTORIES (Cont.)

### f. Ore Statement

| | Maas | Race Course | Maas Spcl. | R. C. Spcl. | Total | Total Last Year |
|---|---|---|---|---|---|---|
| On Hand 1-1-46 | 61,488 | 17,158 | 23,889 | 16,584 | 119,119 | 78,175 |
| Product for Year | 237,645 | 63,983 | 107,790 | 66,930 | 476,348 | 555,107 |
| Transfers | 1,641 | 1,682 | 1,641 | 1,682 | | |
| Overruns | | | | | | 8,181 |
| Total | 297,492 | 79,459 | 133,320 | 85,196 | 595,467 | 641,463 |
| Shipments | 218,863 | 57,782 | 91,430 | 72,994 | 441,069 | 522,344 |
| Balance on Hand | 78,629 | 21,677 | 41,890 | 12,202 | 154,398 | 119,119 |

### g. Schedule of Operations

1946 — January 1st to February 8th, 2 8-hour shifts, six days per week. February 8th to May 21st mine idle on account of strike. May 21st to December 31st, 2 8-hour shifts six days per week. A small tramming and hoisting shift was put on the third shift July 15th and continued to December 31st.

1945 2 8-hour shifts, — 5 days per week from January 1st to January 27th, 6 days per week from January 27th to December 31st, except the afternoon shift on Saturdays was not necessarily a complete mining shift, being used partly for repairing and cleaning up. One shift only was operated from August 12th to August 25th to afford the men one week's vacation.

1944 3 8-hour shifts, — 5 days per week and one 8-hour shift on Saturday from January 1st to July 1st, 2 8-hour shifts, 5 days per week from July 1st to December 31st, with only repair work on Saturday and Sunday.

### h. Delays

There were no major delays during 1946, and the minor delays were made up on overtime hoisting or on the third shift.

## 3. ANALYSIS

### a. Average Mine Analysis on Output

| | 1946 | | | | 1945 | | | |
|---|---|---|---|---|---|---|---|---|
| | Iron | Phos. | Sil. | Sul. | Iron | Phos. | Sil. | Sul. |
| Maas | 59.18 | .110 | 9.22 | .038 | 59.95 | .109 | 8.30 | .040 |
| Maas Special | 59.80 | .101 | 8.19 | .225 | 60.37 | .100 | 6.98 | .196 |
| Race Course | 59.46 | .112 | 8.82 | .040 | 60.26 | .105 | 7.78 | .042 |
| Race Course Special | 59.75 | .109 | 7.90 | .235 | 60.54 | .102 | 7.10 | .200 |

# MAAS MINE
# ANNUAL REPORT
# YEAR 1946

## 3. ANALYSIS

### b. Average Mine Analysis on Ore Shipped

| Grade | Iron | Phos. | Sil. | Mang. | Alum. | Lime | Mag. | Sul. | Loss | Moist. |
|---|---|---|---|---|---|---|---|---|---|---|
| Maas & R.C. Non-Bess. | 59.25 | .112 | 9.32 | .21 | 2.83 | .51 | .23 | .040 | 1.75 | 12.50 |
| Maas & R.C. Special | 59.75 | .099 | 8.16 | .21 | 2.85 | .71 | .16 | .222 | 2.00 | 13.25 |

### d. Average Analysis of Ore in Stock - December 31, 1946

Average Natural Analysis

| Grade | Tons | Iron | Phos. | Sil. | Mang. | Alum. | Lime | Mag. | Sul. | Loss | Moist |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Maas | 78,629 | 51.93 | .097 | 8.21 | .18 | 2.49 | .45 | .20 | .042 | 1.55 | 12.27 |
| Maas Special | 41,890 | 52.00 | .087 | 6.81 | .18 | 2.48 | .62 | .14 | .202 | 1.74 | 13.04 |
| Race Course | 21,677 | 52.15 | .099 | 7.21 | .20 | 2.38 | .50 | .20 | .057 | 1.45 | 12.74 |
| Race Course Spcl. | 12,202 | 51.44 | .092 | 7.13 | .21 | 2.45 | .41 | .23 | .228 | 1.73 | 13.36 |

## 4. ESTIMATE OF ORE RESERVES

### a. Developed Ore

Assumption: 12 Cu. Ft. equals one ton.
10% deduction for rock.
10% deduction for loss in mining.

| Standard<br>Location | Race Course Lease | Maas Lease | B. K. Road City of Neg. Lease | Total Tons |
|---|---|---|---|---|
| Above 3rd Level | | 11,075 | 460 | 11,535 |
| 3rd to 4th Levels | 116,166 | 1,495,692 | 4,464 | 1,616,322 |
| 4th to 5th Levels | 123,100 | 382,998 | | 506,098 |
| Gross Total 11-30-46 | 239,266 | 1,889,765 | 4,924 | 2,133,955 |
| Less Dec. 1946 Product | 7,696 | 33,115 | | 40,811 |
| Gross Total 12-31-46 | 231,570 | 1,856,650 | 4,924 | 2,093,144 |
| Less 10% for Mining & Rock | 23,927 | 188,977 | 492 | 213,396 |
| Net Total Standard Grade | 207,643 | 1,667,673 | 4,432 | 1,879,748 |
| **Special** | | | | |
| 4th to 5th Levels | 406,854 | 774,160 | 30,300 | 1,211,314 |
| 5th to 6th Levels | 876,765 | 2,055,921 | | 2,932,686 |
| Below 6th Level | 18,542 | 1,028,750 | | 1,047,292 |
| Gross Total 11-30-46 | 1,302,161 | 3,858,831 | 30,300 | 5,191,292 |
| Less Dec. 1946 Product | 4,537 | 6,794 | | 11,331 |
| Gross Total 12-31-46 | 1,297,624 | 3,852,037 | 30,300 | 5,179,961 |
| Less 10% for Mining & Rock | 130,216 | 385,883 | 3,030 | 519,129 |
| Net Total Special Grade | 1,167,408 | 3,466,154 | 27,270 | 4,660,832 |
| Total All Grades | 1,375,051 | 5,133,827 | 31,702 | 6,540,580 |

In the Maas Area leased to Negaunee Mine, including N 1/3 and N 1/6 of right-of-way, there were 524,546 tons as ofDecember 31, 1946, of which 53,100 tons were of special grade.

MAAS MINE
ANNUAL REPORT
YEAR 1946

## 4. ESTIMATE OF ORE RESERVES

### a. Developed Ore (Cont.)

There was a total increase of 478,000 tons in the developed ore reserves after the production for 1946 had been deducted. The distribution of this increase is shown below.

| | Maas | Race Course | Total |
|---|---|---|---|
| Standard Grade | 68,000 Tons | 32,000 Tons | 36,000 Tons |
| Special Grade | 480,000 Tons | 34,000 Tons | 514,000 Tons |
| Total | 412,000 Tons | 66,000 Tons | 478,000 Tons |

The decrease of 68,000 tons in the standard grade Maas Lease was occasioned by the flattening of the North footwall between 3rd and 4th Levels. This caused a reduction of approximately 100,000 tons, which was offset by some small increases elsewhere and also by recovering some standard ore from the special grade areas. The increase of 32,000 tons in the standard grade Race Course Lease was due almost entirely to being able to grade out a considerable tonnage of low sulphur ore from places estimated to run high in sulphur. The increase in the special grade on the Race Course Lease was due to the steepening of the North footwall above the 5th Level.

The large increase in the Maas Special grade was accounted for by development done during 1946 just above the 6th Level. This proved that the ore outline was considerably further to the West than had been anticipated. This made a decided increase in the 6th Level area, thus increasing the volume both above and below the level.

### c. Estimated Natural Reserve Analysis

| Grade | Iron | Phos. | Sil. | Mang. | Alum. | Lime | Mag. | Sul. | Loss | Moist |
|---|---|---|---|---|---|---|---|---|---|---|
| Maas & Race Course Non-Bessemer | 52.50 | .104 | 7.70 | .19 | 2.20 | .57 | .22 | .025 | 1.70 | 12.00 |
| Maas & Race Course Special | 53.00 | .090 | 6.80 | .18 | 2.00 | .52 | .16 | .180 | 1.40 | 12.50 |

### d. Estimated Production
### January 1st, 1947 to January 1st, 1948

| Grade | Estimated Production 12 Shifts Per Week |
|---|---|
| Maas & Race Course Standard | 442,500 |
| Maas & Race Course Special | 320,000 |
| Plus 4% Overrun on Ore Stocked | 10,000 |
| Total | 772,500 |

| Grade | Iron | Phos. | Sil. | Mang. | Alum. | Lime | Mag. | Sul. | Loss | Moist. | Iron Nat'l |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Maas & Race Course Non-Bessemer | 59.50 | .115 | 8.80 | .22 | 2.50 | .65 | .25 | .025 | 1.90 | 12.50 | 52.50 |
| Maas & Race Course Special | 60.00 | .100 | 7.80 | .22 | 2.28 | .60 | .18 | .200 | 1.60 | 13.00 | 53.00 |

5. LABOR & WAGES

a. Comments

Following fifty years of comparative quiet on the Marquette Range in the labor situation, a general strike of all the iron ore miners in the Lake Superior Region was called on February 8th by the United Steelworkers of America, with which branch of the C.I.O. the miners are affiliated. This strike lasted until May 21st, when the miners went back to work at an increase of 18½ cents per hour. There were three days in March when approximately 75, or one-fifth of the men decided to return to work, but after two demonstrations at the mine by a very large number of pickets and several personal incidents of intimidation led by outside "goons", these men decided to stay home and avoid trouble. There were only 12 men who did not return after the strike, and to offset this, 20 men were transferred from the Princeton Mine, which had to be closed on account of the strike. With the addition of these and the returning of some 40 veterans, the necessary quota was filled by July, and there were very few changes after that date. There was considerable ill feeling between those who had attempted to work and the more radical of the others, and this was reflected in several incidents of minor damage to personal property for the first few weeks after the strike was settled, but on the whole the men soon adjusted their grievances and in most cases have worked as efficiently as before. The following table shows the comparison in labor turnover for the last three years.

| | 1946 | 1945 | 1944 |
|---|---|---|---|
| Died | 0 | 3 | 0 |
| Fatal Accident | 0 | 1 | 0 |
| Retired on Account of Age or Total Disability | 7 | 9 | 3 |
| Unable to Work at Mine on Account of Ill Health | 5 | 2 | 10 |
| Transferred to other C.C.I.Co. Properties | 4 | 2 | 17 |
| Left for Armed Services of U.S. | 0 | 0 | 37 |
| Quit for Other Occupations | 26 | 18 | 69 |
| Discharges & Lay-Offs | 1 | 0 | 3 |
| Total Loss | 43 | 35 | 139 |
| Hired or Transferred to Maas | 75 | 16 | 20 |
| Net Loss | | 19 | 119 |
| Net Gain | 32 | | |
| Experienced Miners Included in Total Loss | 13 | 7 | 57 |

Of the total of 135 men who left the Maas Mine for the armed services during the war, 57 men, or 41.5% had resumed work at the Company's properties, five were killed in action, and 12 were still in service. The remaining 67 who had been discharged were either idle, obtaining further education, or working at other occupations.

The average age of the employees in 1946 was 42 as compared with 43 in 1945, due to the large number of younger men who had returned. There were 30 men 60 years of age or over, 14 who had served the company for at least 40 years and 76 for 25 to 40 years.

Due to the loss of product during the strike, it was decided that the men would receive their vacation pay but would continue at work. However, a few asked for time off to visit relatives or work on farms, and approximately one-fourth of the men took one week during deer season. General absenteeism amounted to 5.1% exlusive of men home on account of sickness and injury.

311 men, or 77%, received pay for 96 hours.
68 men, or 17%, received pay for 48 hours.
22 men, or 6%, were ineligible, having worked less than one year.

MAAS MINE
ANNUAL REPORT
YEAR 1946

5. LABOR & WAGES

a. Comments (Cont.)

Proportion of surface to underground men:

| 1946 | 1945 | 1944 | 1943 | 1942 |
|---|---|---|---|---|
| 1 - 5.1 | 1 - 4.5 | 1 - 5.1 | 1 - 5.1 | 1 - 5.7 |

b. Comparative Statement of Wages & Product

| | 1946 | 1945 | Increase | Decrease |
|---|---|---|---|---|
| Product | 476,348 | 558,633 | | 82,285 |
| Number of Shifts & Hours | 218 | 301 | | 83 |
| 1 8-hour | 3 | 12 | | 9 |
| 2 8-hour | 215 | 289 | | 74 |
| AVERAGE NO. MEN WORKING | | | | |
| Surface | 53 | 67 | | 14 |
| Underground | 244 | 285 | | 41 |
| Total | 297 | 352 | | 55 |
| AVERAGE WAGES PER DAY | | | | |
| Surface | 9.56 | 7.65 | 1.91 | |
| Underground | 10.40 | 8.76 | 1.64 | |
| Total | 10.24 | 8.55 | 1.69 | |
| AVERAGE WAGES PER MONTH 12 Shifts per Week | | | | |
| Surface | 239.00 | 191.25 | 47.75 | |
| Underground | 260.00 | 219.00 | 41.00 | |
| Total | 256.00 | 213.75 | 42.25 | |
| PRODUCT PER MAN PER DAY | | | | |
| Surface | 32.09 | 28.07 | 4.02 | |
| Underground | 7.17 | 6.52 | .65 | |
| Total | 5.86 | 5.29 | .57 | |
| LABOR COST PER TON | | | | |
| Surface | .298 | .273 | .025 | |
| Underground | 1.450 | 1.342 | .108 | |
| Total | 1.748 | 1.615 | .133 | |
| AVERAGE PRODUCT MINING | | | | |
| Stoping | 19.09 | 18.01 | 1.08 | |
| Ore Development | 13.43 | 9.51 | 3.92 | |
| Total | 19.03 | 17.43 | 1.60 | |
| AVERAGE WAGES CONTRACT LABOR | 10.66 | 8.85 | 1.81 | |
| TOTAL NUMBER OF DAYS | | | | |
| Surface | 14,842 3/4 | 19,900 3/4 | | 5,058 |
| Underground | 66,411 | 85,654 1/2 | | 19,243 1/2 |
| Total | 81,253 3/4 | 105,555 1/4 | | 24,301 1/2 |

MAAS MINE
ANNUAL REPORT
YEAR 1946

5. LABOR & WAGES

b. Comparative Statement of Wages & Product (Cont.)

| | 1946 | 1945 | Increase | Decrease |
|---|---|---|---|---|
| AMOUNT FOR LABOR | | | | |
| Surface | 141,873.66 | 152,248.85 | | 10,375.19 |
| Underground | 690,513.65 | 749,907.67 | | 59,394.02 |
| Total | 832,387.31 | 902,156.52 | | 69,769.21 |
| AVERAGE WAGES PER MONTH BASED ON MEN CARRIED ON MINE PAYROLL | | | | |
| Surface | 212.54 | 176.10 | 36.44 | |
| Underground | 240.67 | 217.94 | 22.73 | |
| Total | 235.65 | 210.00 | 25.65 | |

c. Nationality of Employees

| As to Parentage | 1946 | % | 1945 | % |
|---|---|---|---|---|
| Finnish | 160 | 39.7 | 147 | 39.7 |
| English | 79 | 19.6 | 75 | 20.2 |
| American | 69 | 17.0 | 55 | 14.8 |
| Italian | 39 | 9.7 | 35 | 9.5 |
| Swedish | 23 | 5.7 | 24 | 6.5 |
| French (Canadian) | 17 | 4.2 | 19 | 5.1 |
| German | 6 | 1.5 | 5 | 1.4 |
| Norwegian | 5 | 1.2 | 5 | 1.4 |
| Danish | 3 | .7 | 3 | .8 |
| Austrian | 2 | .5 | 1 | .3 |
| Irish | 1 | .2 | 1 | .3 |
| Total | 404 | 100.0 | 370 | 100.0 |

| As to Birth | American Born | | Foreign Born | |
|---|---|---|---|---|
| | 1946 | 1945 | 1946 | 1945 |
| Finnish | 110 | 95 | 50 | 52 |
| English | 49 | 45 | 30 | 30 |
| American | 69 | 55 | | |
| Italian | 17 | 12 | 22 | 23 |
| Swedish | 19 | 20 | 4 | 4 |
| French | 17 | 19 | | |
| German | 6 | 5 | | |
| Norwegian | 5 | 4 | | 1 |
| Danish | 3 | 3 | | |
| Austrian | 1 | | 1 | 1 |
| Irish | 1 | 1 | | |
| Total | 297 | 259 | 107 | 111 |

MAAS MINE
ANNUAL REPORT
YEAR 1946

## 6. SURFACE

### a. Buildings & Repairs

There were only minor repairs made on any of the buildings, and there was no new construction during 1946.

### b. Location Buildings & Repairs

The same five-man crew as of last year continued to be employed on repairs to rented houses in 1946. Some work on chimneys and foundations was also done by a mason who was hired when necessary. Outside of minor repairs to a considerable number of the houses, the majority of the time was employed in repairing the siding and painting four of the larger residences. Four other houses had fairly large repairs to porches, garages, and roofs.

Near the middle of the year it was decided to offer several of the houses, which were not situated over the possible cave area due to mining, for sale, and during the remainder of the year four houses were sold and the contracts signed. Four others and one store building were applied for, but their sale is still pending on account of the diversified ownership of the lots. It is expected that this matter will be cleared up early in 1947, and these, together with a few others can then be disposed of. There were no houses purchased in 1946.

| House No. | Address | Lot | Block | Addition | Sold To | Date |
|---|---|---|---|---|---|---|
| 15 | 951 Pine St. | 27 | 2 | C.C.I.Co.'s 2nd | Joseph Thomas | 7/1/46 |
| 143 | 961 Pine St. | 29 | 2 | C.C.I.Co.'s 2nd | Onnie Marjamaa | 7/1/46 |
| 162 | 1005 Pine St. | 8 | 1 | C.C.I.Co.'s 2nd | A.J.Stromquist | 7/1/46 |
| 104 | Ann St. | 6 | | MacKenzie | Edwin Peterson | 8/1/46 |
| 172 | Main St. | 9 & 10 | 36 | Pioneer Iron Company's Plat | Dan Matthews | 8/1/46 |
| Company Barn | Lincoln St. | S.W. Corner, Maas Lease | | | Alex Bartell | 8/5/46 |

These last two buildings were dismantled.

As of December 31st, 1946, the following were listed as Maas Mine houses.

| | |
|---|---|
| Single-Family Houses | 48 |
| Two-Family Houses | 5 |
| Three-Family Houses | 1 |
| Legion Club | 1 |
| Stores | 2 |
| Church | 1 |
| Total | 58 |

### c. Stockpiles

Shipments from stockpile this year ceased on November 21st, and from the pocket on November 27th. There was left in stock at the end of the shipping season approximately 60,000 tons of standard ore and 40,000 tons of special grade, which was slightly more than in 1945.

MAAS MINE
ANNUAL REPORT
YEAR 1946

## 6. SURFACE

### c. Stockpiles (Cont.)

Both the Southeast and Southwest timber stocking trestles were left intact during the year, but when removing the ore from the Northwest trestle, several legs broke, necessitating the dismantling of approximately 30 bents. After loading was completed, new bents were assembled and re-erected. All of the trestles are now equiped with the third rail, and the larry car system is used throughout. 25% of the ore was too wet to load directly at the pocket and had to be stocked and allowed to drain. This, of course, decreases the amount of overrun which would be obtained when shipping from the pocket, and unless the piles are cleaned up during the year, this cannot be credited against the cost per ton.

The engineer's estimate of ore in stock last fall shows an underun in the special grade, but as the larger proportion of this ore was very wet, it is felt that it is much denser and therefore a smaller factor could have been used. After the winter season stocking is completed, there is no doubt that the ore in stock will more than equal the book figures. There was no stock-pile overrun credited during the year, but the engineer's estimate is as follows:

| | Maas | Race Course | Maas Spcl. | R. C. Spcl. | Total |
|---|---|---|---|---|---|
| Engineer's Estimate | 202 | 2,207 | 1,018 | 1,113 | 126 |

### d. Tracks, Roads, etc.

There was no work outside of general maintenance on either tracks or roads during 1946, but it is intended, now that it is possible to obtain asphalt, to macadamize the main entrance to the mine from the West. This road becomes very rough from time to time on account of the heavy trucks hauling mine timber and supplies and it is also very dusty.

### e. Timber Yard

There was an ample supply of the various types of mine timber on hand at all times, and it was also possible to obtain sufficient additional stull timber to be peeled and treated for use on the main levels. An electric chain saw was ordered for framing the sets, but up to the last of the year this had not arrived. This saw operates directly from the present source of power and does not have the complicated transformers, generators, etc. that have been necessary equipment heretofore. The amount of timber handled during the year has naturally decreased due to the larger proportion of ore which has been produced from sub level stopes and by sub caving. The method of delivery of the timber was about 50% each on railroad cars and by trucks.