

ATHENS MINE
ANNUAL REPORT
YEAR 1935

5. LABOR
AND
WAGES: (Cont'd)

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

| | <u>1935</u> | <u>1935</u> | <u>1934</u> | <u>Increase</u> | <u>Decrease</u> |
|--|---------------------------------------|-------------|---------------------------------------|--------------------------------------|-----------------|
| <u>PRODUCT PER MAN PER DAY:</u> | | | | | |
| Surface | 20.12 | | 20.27 | | .15 |
| Underground | <u>6.56</u> | | <u>6.97</u> | | <u>.41</u> |
| Total | 4.95 | | 5.18 | | .23 |
| <u>LABOR COST PER TON:</u> | | | | | |
| Surface | .206 | | .199 | .007 | |
| Underground | <u>.743</u> | | <u>.684</u> | <u>.059</u> | |
| Total | .949 | | .883 | .066 | |
| <u>AVERAGE PRODUCT MINING:</u> | | | | | |
| Stoping | 22.38 | | 22.20 | .18 | |
| Ore Development | <u>10.20</u> | | <u>9.18</u> | <u>1.02</u> | |
| Total | 20.85 | | 22.04 | | 1.19 |
| AVERAGE WAGES CONT. LABOR | 5.80 | | 5.66 | .14 | |
| <u>TOTAL NUMBER OF DAYS:</u> | | | | | |
| Surface | 9,567 $\frac{1}{2}$ | | 8,025 $\frac{1}{4}$ | 1,542 $\frac{1}{4}$ | |
| Underground | <u>29,342$\frac{1}{4}$</u> | | <u>23,355$\frac{1}{4}$</u> | <u>5,987$\frac{1}{4}$</u> | |
| Total | 38,909 $\frac{3}{4}$ | | 31,380 $\frac{1}{2}$ | 7,529 $\frac{1}{4}$ | |
| <u>AMOUNT FOR LABOR:</u> | | | | | |
| Surface | 39,643.24 | | 32,333.54 | 7,309.70 | |
| Underground | <u>143,093.67</u> | | <u>111,324.10</u> | <u>31,769.57</u> | |
| Total | 182,736.91 | | 143,657.64 | 39,079.27 | |
| <u>AVERAGE WAGES PER MONTH BASED ON MEN CARRIED ON MINE PAYROLL:</u> | | | | | |
| Surface | 66.72 | | 54.24 | 12.48 | |
| Underground | <u>70.91</u> | | <u>60.16</u> | <u>10.75</u> | |
| Total | 70.03 | | 54.52 | 15.51 | |

Proportion of Surface to Underground Men:

1935 - 1 to 3.53 - 1 8-hr. shift, 2 days per week, Jan. 1st to Feb. 11th.
3 days per week, Feb. 11th to Dec. 31st.

1934 - 1 to 3.49 - 1 8-hr. shift, 3 days per week Jan. 1st to Sept. 1st.
2 days per week Sept. 1st to December 31st.

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6. SURFACE:

a-1. Buildings:

In the summer the roofs of the dry house, engine house and shop buildings were repaired, after which the asbestos roofing was given a coat of primer and sealcote compound.

a-2. Docks, Trestles and Pockets:

The wood stocking trestle at the end of the southeast steel stocking trestle was dismantled in the summer as the legs had rotted and it was dangerous to leave it standing. The usable material was salvaged. This was the trestle from which Mitchell ore was stocked prior to 1934 since which time ore from this lease has been stocked from the northeast steel stocking trestle.

In May the coal dock trestle was overhauled - four sills and several legs were replaced.

The rock trestle required considerable attention during the last half of the year in order to keep the tracks in shape for stocking the considerable quantity of rock hoisted during this period. The tracks have been moved onto the pile from the original wood stocking trestle and had to be carefully blocked to prevent accidents to the top tram side dumping car.

A number of repairs were made during the year in the shaft house. New plates were installed in the skip dumps, replacing worn plates. New runners were installed in the skip roads opposite the dumps. The channels behind the runners were badly worn and bent out of shape and they were replaced with new channels 32 ft. in length.

a-3. General:

All the scrap iron at the mine including all the old wire rope was sold in the summer. It was loaded and shipped by the purchaser.

b. Stockpiles:

This year all the ore under the northeast steel stocking trestle was loaded and shipped. This included all the Mitchell Lease ore stocked in the winter of 1934-35. The shovel then moved to the southeast steel trestle where most of the ore was loaded before the close of the shipping season. This winter all the Mitchell Lease ore will be stocked from the northeast steel trestle and the Athens from the southeast steel trestle.

c. Timber Treating Plant:

The timber treating plant went into operation for a short time late in May to treat some timber that had been peeled the previous fall and left to dry out over the winter. The plant then closed down until in July. During the shut down new timber was framed, peeled and decked to dry. The plant operated three weeks in July and treated all of the timber that was ready

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6. SURFACE: (Cont'd)c. Timber Treating Plant: (Cont'd)

at that time. It closed down again until the last half of August when treatment was resumed and continued with a few interruptions until early in October. In addition to treating legs and caps, 1840 pieces of 5' 4" cribbing were treated and also ladder sides for use in a new ventilation raise in ore from the 6th to 4th level. Also several thousand feet of 2" hardwood plank were treated as an experiment to determine if the life of the treated plank in a raise would be increased sufficiently to justify the expense.

Several experiments are now being made to determine if the open tank treatment with Zinc Chloride adds enough to the life of the material to justify the treatment expense. No data is available on the results of treatment of the soft woods, such as spruce, tamarack and Oregon fir. These woods are used in the mine in the form of ladder sides, doors and sollars in raises, planking in bottom of chutes, etc. In 1934 fir ties for one track on the steel trestles were treated with Zinc Chloride and the ties on the other trestle dipped in Creosote. An actual comparison of the added life due to treatment by the two agents will be available later. It is planned to continue the investigation of the effect of Zinc Chloride treatment on the different kinds of wood used in the mines.

The following table gives comparative operating costs of the treating plant for three years:

| | <u>Cost per Ft.</u> <u>1935</u> | <u>Cost per Ft.</u> <u>1934</u> | <u>Cost per Ft.</u> <u>1933</u> |
|----------------------|------------------------------------|------------------------------------|------------------------------------|
| Peeling | .0254 | .0287 | .0278 |
| Treating | .0326 | .0211 | .0367 |
| Decking | .0018 | .0133 | .0119 |
| Zinc Chloride | .0157 | .0212 | .0517 |
| Heating, Water, etc. | .0096 | .0091 | (a) .0430 |
| Total | <u>.0851</u> | <u>.0934</u> | <u>.1711</u> |
| Maintenance Cost | <u>.0030</u> | <u>.0000</u> | <u>.0082</u> |
| Grand Total | <u>.0881</u> | <u>.0934</u> | <u>.1793</u> |

(a) Heating cost high in 1933 account of operating heating plant during time mine was idle, when all expense was charged to treating timber.

| <u>Year</u> | <u>No. of Pieces</u> <u>Treated</u> | <u>No. of Feet</u> <u>Treated</u> | | |
|---|--|--------------------------------------|--------------|-------------------------|
| 1935 | 1,931 | 15,966 | | |
| 1934 | 1,930 | 16,848 | | |
| | | <u>1935</u> | <u>1934</u> | <u>Inc.</u> <u>Dec.</u> |
| No. of Pieces used at Athens | | 759 | 324 | 435 |
| No. of Pieces shipped to Maas and Negaunee Mines | | <u>972</u> | <u>975</u> | <u> </u> <u>3</u> |
| Total Pcs. used and shipped | | <u>1,731</u> | <u>1,299</u> | <u>432</u> |

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6. SURFACE: (Cont'd)

c. Timber Treating Plant: (Cont'd)

| | <u>Treated Timber on Hand 12/31/35</u> | <u>Peeled Untreated Timber On Hand 12/31/35</u> |
|------------------|--|---|
| 9 ft. Pieces | 355 | None |
| 8 ft. " | 625 | " |
| Total | 980 | |
| On Hand 12/31/34 | 816 | |
| Increase - 1935 | 164 | |

The treatment expense of material other than hardwood stulls is charged out directly and is not included in above costs.

d. Water Purchased for Heating, Cooling, etc.:

The following table shows the cost of the water consumed in heating, cooling, watering lawns, etc., for the years 1933, 1934 and 1935:

| | 1935 | | 1934 | | 1933 | |
|--------------|--------------|---------------|--------------|---------------|--------------|---------------|
| | <u>Gals.</u> | <u>Amount</u> | <u>Gals.</u> | <u>Amount</u> | <u>Gals.</u> | <u>Amount</u> |
| 1st Quarter | 193,000 | 19.14 | 297,000 | 27.85 | 240,000 | 22.98 |
| 2nd Quarter | 318,000 | 30.84 | 294,000 | 28.28 | 145,000 | 17.02 |
| 3rd Quarter | 679,000 | 55.99 | 303,000 | 30.57 | 403,000 | 35.49 |
| 4th Quarter | 380,000 | 33.97 | 774,000 | 76.86 | 223,000 | 21.21 |
| Total | 1,570,000 | 139.94 | 1,168,000 | 113.56 | 1,011,000 | 96.70 |
| Product | 192,534 tons | | 162,706 tons | | 47,368 tons | |
| Cost Per Ton | .00073 | | .00070 | | .00204 | |

e. Grounds:

The grounds around the mine buildings were kept in good condition in 1935. The grass on the lawn areas was cut regularly and the shrubbery pruned. A heavy application of fertilizer is needed on the lawn and shrubbery beds as this has been postponed during the depression.

7. UNDERGROUND:

a. Shaft Sinking:

There was no shaft sinking in 1935.

b. Development:

There has been very little development work done at this property since No. 620 cross-cut was driven on the 6th level previous to the shut-down period of 1932. Late in 1934 mining in Block No. 2 was approaching the 8th level elevation and it became necessary to replace the mining raises which were being lost due to the crushing of this level. In order to accelerate the mining of ore from the Mitchell Lease and for a number of other reasons, development was started on the 6th level instead of continuing Block No. 2 downward toward the 9th level. The most important development of the year was the driving of No. 610 cross-cut a distance of 150 ft. east and parallel to No. 620 cross-cut. This development will make available for mining over the next few years a block of ore 150 ft. wide in the west half of Block No. 4. The ore is centrally located on Mitchell lots Nos. 8 and 9 so that mining here will deplete the ore reserves on two of the three Mitchell lots.

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7. UNDERGROUND: (Cont'd)

b. Development: (Cont'd)

No. 610 cross-cut was started in March and at the end of the year raise development was completed except for the two raises at the southeast end. The cross-cut proved the downward continuation of the mass of mixed ore and paint rock which had previously been disclosed on the footwall at the southeast end of the 4th level drift. This possibility had earlier been foreseen so that the estimate of ore reserves was not reduced to a great extent. Since the 4th and 6th levels are 200 ft. apart vertically, development of an intermediate sub level was also started during the year at the -485' sub level elevation.

Two new raises were put up from the west side of No. 620 cross-cut to follow the ore under the westerly pitching jasper hanging wall. A connection was also driven from No. 620 raise at the -515' sub level elevation to the new intermediate sub level drift above No. 610 cross-cut. The ventilation drift at the -550' sub level elevation was extended 95 ft. to the northeast and a new ventilation raise, in ore, started upward to the 4th level. This raise is to replace the rotted and crushed No. 610 raise on the north side of the dike which had been recribbed so often that it was impossible to keep it open. A new experiment is being tried out in this raise by using treated cribbing timber. From tests on penetration, it is believed that as in the case of stull timber, an additional useful life of from two to three times the untreated timber will result.

At the end of the year a second ventilation raise was being put up from the 10th to 9th level in rock. This is to replace No. 1023 raise which is in ore and has given continuous trouble due to crushing. At the 10th level elevation there was also a new sump clean-out and enlargement drift driven a distance of 242 ft. in rock and the purpose and results of this work are explained elsewhere in this report. The same is true of the transfer raises at the shaft from the 6th to 8th level which were stripped and enlarged during the year.

The comparative figures for drifting and raising are a good indication of the increase in development work which has been below normal since 1931.

c. Stopings:

(1) General Remarks:

For a number of years previous to 1935 mining operations have been conducted in Block No. 3 above the 6th level and Block No. 2 above the 8th. At the end of the past year only two contracts were mining in Block No. 2 above the 8th level. Operations had been accelerated in Block No. 3 and the first mining drift had been started in the west half of Block No. 4 near the 4th level elevation. Approximately one-half the number of contracts working in Block No. 3 and all of the mining contracts to be transferred to Block No. 4 will be producing Mitchell ore. Due to the continued curtailment of operations, the downward advance in Blocks Nos. 2 and 3 has averaged about one full sub level for the year. Above the 6th level mining was under way on the north side of the fault dike on the sub levels from the -515' to the -540' and on the south side of the dike from the -430' to the -470'. Above the 8th level in Block No. 2 mining was done on the -760' and -770' sub levels on the north side of the fault dike and on the south side on the -745' and -760' sub levels.

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7. UNDERGROUND: (Cont'd)

c. Stoppings: (Cont'd)

(1) General Remarks: (Cont'd)

During the year mining operations were resumed in the ore body adjacent to the south side of the fault dike above the 6th level. One particularly troublesome factor in this area was the mining under rotted covering which resulted from the shut down periods in 1932 and 1933. Extensive raise repairs were necessary on reopening this area and this repair work will not be completed until well into 1936.

The ore area above No. 620 cross-cut which is partly in Athens ore and partly in Mitchell ore, continued to increase in size on successive sub levels. As explained under development, several new raises were necessary on the west side of this cross-cut in order to mine the westerly extension of the ore under the jasper hanging wall. Mining conditions in this area and the territory on the north side of the fault dike were excellent throughout the year. A good covering has been secured, the working places are well ventilated and scraping distances are of the proper length. On the sub levels above the 8th level water conditions decreased in severity as mining progressed from west to east in completing the present mining program in Block No. 2. The improved conditions within this block has been due to pumping at the Breitung shaft which during the year gradually decreased the total water pumped from the Athens Mine to approximately 250 gallons per minute. The average amount pumped from the Athens for a number of years prior to the surface cave was 225 gallons per minute, so it can be seen that the water entering the workings has been reduced to nearly the former volume. It is hoped that at least during the winter months a reduction to approximately 230 gallons per minute can be effected. When Block No. 2 is reopened by way of the 9th level at some future date, it is hoped the water conditions will be greatly improved.

A continuation of extensive repairs to the 6th level raises was necessary throughout the year. In last years' report the example was given of the several times raises were recribbed in No. 620 cross-cut in mining about two sub levels at the upper part of these raises. During 1935 it has been noted that in every month of the year one or two gangs had to be taken off production and used to make repairs in one of these raises. Due to the continued recribbing, the raises above No. 620 cross-cut have become more and more unsettled and it cannot be emphasized too strongly that the shut down period in 1932, which was responsible for the start of this condition, will eventually add materially to the cost of ore produced from this area. As stated above, the raises on the south side of the fault dike are at the present time being gradually repaired and will continue to need attention throughout 1936. Early in 1935 the cross-cuts and raises on the west end of the 8th level required extensive repairs due to the pressure resulting from the mining operations a short distance above.

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7. UNDERGROUND: (Cont'd)

c. Stoping: (Cont'd)

(2) Detail of Stopping:

4th Level:

No mining operations were conducted on or above the 4th level elevation during 1935 but the west cross-cut leading to the top of ventilation raises Nos. 609 and 610 was repaired at intervals by replacement of rotted sets with treated timber sets. This drift carries the exhaust air from all the working places and must therefore be kept open to full size.

SUBS ABOVE THE 6TH LEVEL

-415' Sub Level - South Footwall - Mitchell Lease

Mining operations were started late in December above the new No. 610 cross-cut in the west half of Block No. 4 with the cutting out of No. 614 raise at an elevation of -417' or approximately 25 ft. below the 4th level elevation. The raise had reached the jasper hanging wall early in December and at the end of the year a drift was being driven to the southeast under the hanging wall from which an old 4th level drift will be tapped to drain off water which may be present. Nos. 615 and 616 raises to the southeast will be continued to approximately the 4th level elevation before starting to mine under the jasper hanging wall and the old workings in this formerly isolated block on the south footwall, in which mining was done prior to 1924. Mining, however, will be continued from No. 614 raise under the jasper hanging wall in advance of the 4th level operation since it will take several months to complete Nos. 615 and 616 raises to this height.

-430' Sub Level - South Footwall - Mitchell Lease

Mining on this sub level was completed within the limits of Block No. 3 early in 1935 with the mining of two small pillars, one west of No. 625 raise and one east of No. 626 branch raise. The flat lying jasper hanging wall was very irregular in outline and the first sub level in which a solid block of ore was developed in this territory was the next lower or -440' sub level.

-440' Sub Level - South Footwall - Mitchell Lease

The northern half of the ore area was developed and mined in 1934 and several pillars, and most of the southern portion, was mined early in 1935. The westerly pitching jasper hanging wall assumed a more regular outline except in the southeast corner of the ore area where a wedge shaped enlargement persisted. Here, as in the case of the several sub levels above, as new areas under the hanging were developed particular attention was paid to covering down the floor of the sub level with poles and wire fencing to prevent runs of jasper which would dilute the ore. The last mining contract moved down from this sub to the next lower in May but one central pillar was mined from the -450' sub level elevation as late as August.

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7. UNDERGROUND: (Cont'd)

c. Stoping: (Cont'd)

(2) Detail of Stopings: (Cont'd)

-450' Sub Level - South Footwall - Mitchell Lease

Mining at this elevation was continuous from January to November. Four pillars adjacent to No. 622 raise were mined early in the year. No. 627 raise, the first of the two on the west side of No. 620 cross-cut, reached this elevation in June and was an aid in mining the continuously increasing length of ore under the hanging near the slate footwall contact. The average advance of the jasper hanging to the west beyond that of the sub level above was about 15 ft. and in this area, as on the -440' sub level, particular attention was paid to covering down the floors with poles and wire fencing.

-460' Sub Level - South Footwall - Mitchell Lease

This sub level, which was the center of mining operations in this territory at the end of the year, was started by cutting out No. 621 raise in March. The northern portion of the ore area had been mined and the five contracts working at this elevation in December had started slicing in the solid block of ore in the southern half. In December No. 628 raise from the west side of No. 620 cross-cut had reached this elevation and disclosed a 20 ft. advance of the jasper hanging wall to the west. The same was true of the contact north of No. 621 raise which retreated approximately 20 ft. in that direction. Approximately 80% of the ore to be mined at this elevation is on Mitchell lease Lot No. 8 and the remainder on Athens Lot No. 7.

-470' Sub Level - South Footwall

No. 621 raise was cut out in October and a connecting drift driven to the top of the new No. 620 raise which had reached this elevation in September. The northerly retreat of the jasper on the -460' sub level had indicated that there would be a continuous body of ore from the fault dike to the south footwall along the east mining limit of Block No. 3. Accordingly, No. 620 raise was put up from the east side of No. 620 cross-cut to be in position to mine the ore adjoining the old workings on the south side of the fault dike. In December, the single contract mining here had outlined the ore north of No. 620 raise and in several slices had proved the connection of the two ore areas. The total length of the ore body north and south on this sub level is approximately 450 ft.

-485' Sub Level - South Footwall - Mitchell Lease

During 1935 additional development of this intermediate sub level was done in two separate periods. In April a 65' connection drift was driven westerly from the 620 series of raises to the new No. 627 raise. Then in September, the drift which will ultimately connect all of the raises above No. 610 cross-cut was started from No. 612 raise. The north-south drift along this line was kept at a distance of 20 ft. west of the raises to prevent, at some future date, the transfer of weight to the backs of the raises from the crushing of this drift. In December, Nos. 611, 612 and 614 raises had been connected and the drift advanced far enough to the southeast so No. 615 raise will connect when it reaches this elevation in January 1936. Late in December, the contact of the paint rock and ore had been intersected indicating that in a vertical rise of 110 ft. above the 6th level, this contact had retreated a distance of 150 ft. to the south. The remainder of the drift to the southeast to connect with No. 616 raise may be in paint rock. The total drift footage in ore in this series of raises was 205 ft. and in rock 20 ft.

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7. UNDERGROUND: (Cont'd)

c. Stopings: (Cont'd)

(2) Detail of Stopings: (Cont'd)

-515' Sub Level -North Side of Dike

Mining was completed on this sub level early in 1935 with the removal of pillars adjacent to No. 640 raise and the contract mining here moved down to the next lower sub level in March.

-515' Sub Level - South Side of Dike

When the transfer of mining contracts from Block No. 2 above the 8th level started, one of the first moved to the 6th level started repairing No. 633 raise and the old connection to No. 634 raise at this elevation. Mining operations were started here in March and within a few months a second contract was transferred and started slicing southeast of No. 633 raise. Here it was found that the jasper had retreated so far to the west that it was necessary to establish a temporary mining limit until such time as mining adjacent to No. 628 raise reaches this elevation. In December, the west half of the area had been completely mined, connection had been established to No. 629 raise and slicing had started from No. 631 raise after repairs had been made to the ore compartment. Immediate repairs are planned for the ladder and ore compartment of No. 629 raise, after which mining will also start here.

To establish a connection between the 611 series of raises and the 620 series, No. 620 raise was cut out at the elevation of this sub level and a drift driven 145 ft. to the east. In order to protect No. 611 raise a single compartment traveling raise was put up a distance of 30 ft. from the east end of this drift to the -485' traveling road. The drift was driven at this lower elevation because of the proximity of mining operations to the -485' sub level at the 620 series of raises. It will be of value for ventilation for a longer period than if located at the -485' sub level elevation.

-530' Sub Level - North Side of Dike

Except for several slices driven late in 1934, from No. 642 and No. 643 raises in the west portion, this sub level was completely mined during the year. The outline of the ore area was approximately the same as that on the sub level above and good mining conditions prevailed here.

-530' Sub Level - South Side of Dike

The third contract to be transferred from the 8th level to this location on the south side of the fault dike cut out at No. 634 raise early in December and at the end of the month had nearly completed a connection to No. 633 raise. Slicing toward the old mining limit to the west will be started early in 1936.

-540' Sub Level - North Side of Dike

Development and mining of this sub level was almost exactly advanced as far, at the end of 1935, as on the 530' sub level one year ago. It is a good illustration of the mining of approximately one sub level for the year. As was the case on the -530' sub level at the beginning of 1934, the raise connections had been made and mining had been started northwest of Nos. 641 and 643 raises. Three contracts were mining here at the end of the year.

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7. UNDERGROUND: (Cont'd)

c. Stopings: (Cont'd)

(2) Detail of Stopings: (Cont'd)

-550' Sub Level - South Side of Dike

Development work necessary to replace No. 610 ventilation raise which had caved beyond repair was started in November. The development is planned to be in ore as an aid in returning at least a part of the cost and it is further believed that the use of treated cribbing will reduce the maintenance charges to a minimum. Since the ventilation drift at this elevation is to carry the exhaust air from the working places above the new No. 610 cross-cut, the raise was started upward from this elevation instead of from the 6th level. A 95' ore drift was advanced northeast of No. 609 raise and at the end of the year the new raise had reached a height of 13 ft.

6th Level

No. 610 cross-cut was started in March in order to develop an additional area of Mitchell ore on Lots Nos. 8 and 9. The proposed area was on the west half of Block No. 4 on the south footwall, so the new cross-cut was located 150 ft. east and parallel to No. 620 cross-cut. The drift started in ore and advanced 95 ft. around the curve in this material. At this point a mass of mixed paint rock, slate and ore was encountered and the remainder of the drift was in this material, except for the last 10' which was in the true slate footwall. The north-south dimension of this paint rock inclusion appears larger than on any section heretofore developed in the mine. Its vertical extension has now been proved from the 4th to 10th levels. Its presence at the 6th level elevation has been suspected for a number of years so that definite proof has not made necessary any large reduction in the ore reserve estimate. As the drift advanced, timbers were installed for the raises and as the scraper slide was moved ahead, the raises were started. The following table lists the information for each of the five double compartment raises to the end of 1935:

| <u>Raise No.</u> | <u>Total Height</u> | <u>Material</u> |
|------------------|---------------------|--|
| 611 | 118' | Ore 0' to 116'; jasper 116' to 118'. |
| 612 | 141' | Paint rock 0' to 60'; ore 60' to 141'. |
| 614 | 192' | Paint rock 0' to 100'; ore 100' to 189'; jasper 189' to 192'. |
| 615 | | Paint rock 0' to 66'. |
| 616 | | Paint rock 0' to 85'. |

During the year three new raises were put up from No. 620 cross-cut to mine the westward extension of the ore on sub levels above. All were double compartment raises and the following table records the height and material encountered:

| | | |
|-----|------|---|
| 620 | 135' | Ore 0' to 135'. |
| 627 | 160' | Ore 0' to 20'; dike 20' to 70'; ore 70' to 160'. |
| 628 | 138' | Ore 0' to 132'; jasper 132' to 138'. |

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7. UNDERGROUND: (Cont'd)

c. Stoppings: (Cont'd)

(2) Detail of Stoppings: (Cont'd)

6th Level (Cont'd)

In addition to the large amount of repair work done throughout the year in the raises in No. 620 cross-cut, there was an extraordinary amount of retimbering of the level drifts. A large portion of the drifts had been timbered eight to ten years ago with treated timber and replacements are now necessary. Mining operations above the drift along the north side of the fault dike, even though they are at a distance of 50 ft. above the level, have subjected the latter to pressure and this drift has been completely retimbered twice during the year. The same is true of the short cross-cuts leading to ventilation raises Nos. 811 and 814. Repairs have been started and will be continued in 1936 to the six raises on the south side of the fault dike, all of which will have to be completely recribbed as the old cribbing has rotted and the raises are crushing.

SUBS ABOVE THE 8TH LEVEL

-745' Sub Level - South Side of Dike

The ore body on this side of the fault dike is in the form of a gradually narrowing trough between the dike and the slate footwall. A large volume of water has thus been concentrated into a small area so that mining here is under extremely wet conditions. Some drainage drifts had been driven west of No. 839 and No. 840 raises in the latter part of 1934 so that one pillar west of these raises and the ore adjacent to the mining limit was recovered early in 1935 under nearly normal conditions. A small pillar of ore contaminated by dike stringers in the northeast corner of this ore area was left in place.

-760' Sub Level - North Side of Dike

During the first half of the year, several contracts mined pillars adjacent to and south of the 802 series of raises. The loss of No. 851 cross-cut and a concentrated water inflow prohibited mining several pillars in the southwest corner of the area and these will be recovered by way of the 9th level at some future date. It was from this sub level that most of the contracts were transferred to Blocks Nos. 3 and 4 above the 6th level.

-760' Sub Level - South Side of Dike

Mining started here in June by cutting out No. 835 raise and drifting to the southwest after establishing a connection to No. 839 raise. Three efforts were made to penetrate the narrow v-shaped pillar of ore at the west end of the trough but each was unsuccessful because of the inrush of mud and water. The east portion was then mined and at the end of the year the single contract working at this elevation was again drifting to the west in contact with the fault dike removing one of the two small pillars left on this sub level.

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7. UNDERGROUND: (Cont'd)

e. Stoping: (Cont'd)

(2) Detail of Stoping: (Cont'd)

-770' Sub Level - North Side of Dike

The contract mining south of No. 812 raise proved a sizeable deposit to exist between the jasper and slate footwall in this area. A 30' single compartment raise on the west side of the drift disclosed the upward continuation of the ore so operations were suspended here in February so that complete recovery could later be effected by way of the 9th level. Two contracts mined from the No. 805 series of raises during the greater part of the year. A block of ore adjacent to and extending 100 ft. south of the main dike was mined here before these contracts were transferred to the 6th level. The single contract remaining here at the end of 1935 had mined a large area south and west of No. 831 raise. An effort will be made to mine as much ore as possible from this raise because being at the east end of the mining block, it is the least expensive to maintain. This elevation marks the last sub level mineable above the 8th level. The distance from floor to floor is only approximately 25 ft.

8th Level

No mining was done at this elevation during 1935 but extensive re-timbering was necessary early in the year to maintain drift and raise openings in order to mine the pillars on the -760' sub level. When this sub level had been mined, the main level drift was double propped in order to maintain No. 909 ventilation raise as long as possible. At the end of the year only a small amount of re-timbering was necessary within the limits of Block No. 2 to keep the single contract at work in No. 831 raise on the -770' sub level. Replacement of treated timber which has been in place eight to 10 years was necessary in the full length of No. 811 cross-cut and nearly the full length of No. 811 ventilation raise was recribbed.

9th Level

There was no mining at this elevation and only the ordinary amount of re-timbering was done in the level drifts. However, extensive replacement of rotted timbers can no longer be delayed if serious breakdowns are to be avoided.

10th Level

At least two raises between levels are necessary for proper ventilation. One of the raises from the 10th to 9th levels, No. 1023, is in ore and is expensive to maintain. A raise in rock, in addition to No. 1010, will be useful over the remaining life of the mine without maintenance charges for the replacement of cribbing, etc., so No. 1009 raise was started upward toward the 9th level at a distance of 50 ft. east of No. 1010 raise. At a height of 30 ft. the raise entered a caving seam on the contact between the slate and diorite and was abandoned since timbering would have been necessary to carry it higher. A second raise was then started in the slate 200 ft. nearer the shaft and at the end of the year had reached a height of 25 ft. in this material. The raise is circular in section and on completion to the 9th level will be stripped to 8' x 8' in size and gunited to prevent slabbing of the rock.

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7. UNDERGROUND: (Cont'd)

c. Stoping: (Cont'd)

(2) Detail of Stoping: (Cont'd)

10th Level (Cont'd)

A study having shown the saving that could be effected in the Athens pumping charges by cleaning out and enlarging the sump, and the necessary authorization having been secured, the clean-out drift was started in August. After the scraper slide was installed good progress was made in the hard slate formation, 100 ft. of advance being secured in October. The sump was reached in November and the connection to the old sump widened to permit the scraping of the mud. A longer time than was expected was consumed in removing this 15 year old deposit of mud from the Athens sump. The total length of the clean-out drift was 242 ft. including the enlargement. A small ditch was blasted in the new entry to the sump to carry the water to it. The capacity of the old sump when cleaned is approximately 140,000 gallons. The total combined capacity is now in excess of 250,000 gallons which, with an inflow of 250 gallons per minute, gives an 18 hour capacity.

d. Timbering:

The Cost per ton for timber was slightly lower than in 1934. The feet of timber used per ton of ore increased 3.2% while the poles and lagging used per ton of ore decreased. The amount of poles used decreased due to opening less territory under new hanging and under old rotted covering, less lagging was used due to less blocking up of caved areas and less side lagging required in the mining areas. The increase in feet of timber per ton of ore was due to more timber used in new raises and for repair of old raises. There was actually less large (12" to 14") timber and more medium size (10" to 12") timber used in mining operations. As an experiment several drifts connecting raises on sub levels were timbered with large caps 6 ft. in length over all to determine if they would stand up longer under heavy pressure than the regular 8' and 9' caps. In most areas the short caps lasted longer than the 8' and 9' ones. The long caps, however, have one advantage in that they can be propped with either one or two props while the short caps make too small a drift to install props. Where the required life of the drift is short the short caps are satisfactory and reduce repair cost but in a drift that must be kept open for some time the longer caps give more room for propping and retimbering. The timber purchased the last few years has been of high quality, all the stulls have been green, sound, straight hardwood. Green tamarack cribbing timber has again become available - new growth since the beetle practically destroyed all stands of tamarack timber over 20 years ago.

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7. UNDERGROUND: (Cont'd)d. Timbering: (Cont'd)Statement of Timber Used:

| | <u>Linear Feet</u> | <u>Avg. Price Per Foot</u> | <u>Amount 1935</u> | <u>Amount 1934</u> |
|---|------------------------|--------------------------------|------------------------|------------------------|
| 6" to 8" Cribbing | 113,501 | .0338 | 3,835.64 | 1,533.29 |
| 8" to 10" Stulls | 15,418 | .0607 | 935.82 | 536.83 |
| 10" to 12" " | 49,076 | .0803 | 3,943.16 | 3,344.63 |
| 12" to 14" " | 23,277 | .1044 | 2,431.10 | 3,616.93 |
| 14" to 16" " | 1,232 | .1257 | 154.81 | 479.56 |
| Treated Timber | 6,559 | .2032 | 1,332.53 | 795.10 |
| Total 1935 | 209,063 | .0604 | 12,633.06 | |
| Total 1934 | 133,888 | .0769 | | 10,306.34 |
| Lagging - 7 ft. | 579,522 | .7010 | 4,062.49 | 3,653.39 |
| Poles - 9½ ft. | 505,734 | 1.1645 | 5,889.56 | 5,586.33 |
| Total 1935 | 1,085,256 | .9170 | 9,952.05 | |
| Total 1934 | 989,367 | .9339 | | 9,239.72 |
| Grand Total - 1935 | | | 22,585.11 | |
| Grand Total - 1934 | | | | 19,546.06 |
| Product | | | 192,534 | 162,706 |
| Feet of Timber Per Ton of Ore | | | .1086 | .823 |
| " " Lagging " " " " | | | 3.010 | 3.208 |
| " " Poles " " " " | | | 2.627 | 2.866 |
| " " Lagging Per Foot of Timber | | | 2.772 | 3.991 |
| Cost Per Ton for Timber | | | .0656 | .0634 |
| " " " " Lagging | | | .0211 | .0224 |
| " " " " Poles | | | .0306 | .0343 |
| " " " " Wire Fencing | | | - | - |
| Total Cost Per Ton | | | .1173 | .1201 |
| Equivalent of Stull Timber to Board Measure | | | 427,137 | 344,313 |
| Feet of Board Measure Per Ton of Ore | | | 2.218 | 2.116 |

Total Cost for Timber, Lagging, Poles, etc., and Cost Per Ton:

| <u>Year</u> | <u>Amount</u> | <u>Cost Per Ton</u> |
|-------------|---------------|---------------------|
| 1935 | 22,585.11 | .1173 |
| 1934 | 19,546.06 | .1201 |
| 1933 | 11,372.50 | .2401 |
| 1932 | 11,794.89 | .1541 |
| 1931 | 28,704.68 | .1141 |
| 1930 | 38,001.66 | .0985 |
| 1929 | 35,086.43 | .1015 |
| 1928 | 29,160.74 | .1207 |

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7. UNDERGROUND: (Cont'd)

e. Drifting and Raising:

The following statement gives comparative figures of footage of raising and drifting for the years 1935 and 1934:

| <u>Year</u> | <u>Drifting</u> | | | <u>Raising</u> | | | <u>Grand Total</u> |
|-------------|-----------------|-------------|--------------|----------------|-------------|--------------|--------------------|
| | <u>Ore</u> | <u>Rock</u> | <u>Total</u> | <u>Ore</u> | <u>Rock</u> | <u>Total</u> | |
| 1935 | 605' | 288' | 893' | 713' | 442' | 1155' | 2048' |
| 1934 | 135' | 0 | 135' | 215' | 75' | 290' | 425' |
| Increase | 470' | 288' | 758' | 498' | 367' | 865' | 1623' |

Drifting increased 560% in 1935 and raising 300%. Development work was above normal due to opening a new area (west half of Block No. 4) for mining on the 6th level. The footage - approximately equal to 100 ft. of 8' x 8' raise in rock - represented by stripping the two transfer raises at the shaft from the 6th to 8th levels is not included in the above figures nor is the 242 ft. of drifting in rock on the 10th level to provide a clean-out drift and enlarge the sump at the main pumping plant. The cost of stripping the two transfer raises was charged to "Development in Rock" and the cost of work on the sump to "Maintenance-Pumping Machinery".

f. Explosives, Drilling and Blasting:

The pounds of powder used per ton of ore increased approximately 6% in 1935 and the cost per pound of powder increased approximately 3½%. The net increase in cost per ton for all explosives was 7.3%. Two factors accounted for this increase in cost, first, the use of more powder to break ore and the increase in cost of the powder. Ore on the 8th level is quite soft as compared to the 6th level. Transfer of mining operations from the 8th to 6th level from soft to harder ground, naturally increased the amount of powder used and the cost per ton of ore. Even with the increase the total cost is lower than in any year with the exception of 1934, since the mine opened.

Tamping was in general use throughout the mine and this together with close supervision of the amount of powder used has made the lower cost possible.

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7. UNDERGROUND: (Cont'd)f. Explosives, Drilling and Blasting: (Cont'd)Statement of Explosives Used: (Ore Development and Stoping)

| | <u>Quantity</u> | <u>Average Price</u> | <u>Amount 1935</u> | <u>Amount 1934</u> |
|----------------------------------|-----------------|----------------------|--------------------|--------------------|
| 50% Gelatin | 69,650 | 11.71 | 8,154.15 | 6,277.63 |
| Total Powder - 1935 | 69,650 | 11.71 | 8,154.15 | |
| Total Powder - 1934 | 55,500 | 11.30 | | 6,277.63 |
| Fuse - feet | 247,200 | 5.71 | 1,412.04 | 1,190.55 |
| Caps - No. 6 | 42,150 | 11.21 | 472.38 | 367.91 |
| Fuse Lighters | 5,000 | 6.75 | 33.75 | 23.63 |
| Connecting Wire, Exploders, etc. | | | 19.30 | 83.76 |
| Total Fuse, Etc. - 1935 | | | 1,937.47 | |
| Total Fuse, Etc. - 1934 | | | | 1,665.85 |
| Total All Explosives - 1935 | | | 10,091.62 | |
| Total All Explosives - 1934 | | | | 7,943.48 |
| Product | | | 192,534 | 162,706 |
| Pounds of Powder Per Ton of Ore | | | .3618 | .3414 |
| Tons of Ore Per Pound of Powder | | | 2.764 | 2.929 |
| Cost Per Ton - Powder | | | .0423 | .0386 |
| Cost Per Ton - Fuse, Caps, Etc. | | | .0101 | .0102 |
| Cost Per Ton - All Explosives | | | .0524 | .0488 |

(Sinking, Rock Development, Etc.)

| | | | | |
|----------------------------------|-------|-------|-----------|----------|
| Total Powder - 1935 | 9,950 | 12.36 | 1,229.62 | |
| Total Powder - 1934 | 200 | 11.50 | | 23.00 |
| Total Fuse, Caps, Etc. - 1935 | | | 260.92 | |
| Total Fuse, Caps, Etc. - 1934 | | | | 8.52 |
| Total All Explosives - 1935 | | | 1,490.54 | |
| Total All Explosives - 1934 | | | | 31.52 |
| Total Explosives Used in Mine | | | 11,582.16 | 7,975.00 |
| Average Price per lb. for Powder | | | .1179 | .1130 |

90% of Powder used in 1935 was 50% - 10% was 60% used in Rock Development
 100% " " " " 1934 " 50%
 100% " " " " 1933 " 50%
 100% " " " " 1932 " 50%
 58% " " " " 1931 " 60%

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7. UNDERGROUND: (Cont'd)

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

The following statement shows the cost per ton for explosives exclusive of rock development for the period 1929 - 1935 inclusive:

| <u>Year</u> | <u>Cost Per Ton</u> | <u>Product</u> |
|-------------|---------------------|----------------|
| 1935 | .0524 | 192,534 |
| 1934 | .0488 | 162,706 |
| 1933 | .0551 | 47,368 |
| 1932 | .0553 | 76,525 |
| 1931 | .0548 | 251,580 |
| 1930 | .0536 | 385,461 |
| 1929 | .0588 | 343,147 |

g. Mining and Loadings:

There was no change or modification in the method of mining in 1935. Due to lack of areas developed for mining at this property which condition will be gradually overcome with the development of the west half of Block No. 4 above the 6th level, it was not possible to adopt the plan now followed at the Negaunee Mine. This plan consists of wider separation of mining contracts, greater distances between raises and longer slices. It is more nearly radial slicing from raises than straight slicing, also slicing against a solid pillar rather than a pillar cut up by drifts and slices from adjoining raises. It may not work out so well in the Athens ore body due to heavy pressures but at least it is worthy of trial. If successful it will decrease repair costs, increase tons per man per day stoping and lower the cost of production. Proper ventilation is a great factor in efficiency of labor in the mine and this problem is now receiving attention. Rock ventilation raises are being put up to replace raises in ore which are crushing and some of which are beyond repair.

9 ft. timber is used exclusively in mining - the 9 ft. cap increases the width of the slice and the output per foot of advance. There was less trouble from water in 1935 due to finishing work early in the year in several wet areas just above the 8th level and the transfer of the gangs to dry territory above the 6th level. The decrease in Athens Mine water account of pumping at the Breitung shaft did not effect mining to any extent on the 8th level as it had been nearly completed in the wet areas prior to the large reduction in water in the latter months of the year. One area still being mined on the south side of the 8th level between the footwall and the dike has shown no reduction in water during the year but conditions in the main ore body north of the dike have improved materially.

Mining in new areas under the hanging involve difficulties that are not fully overcome until mining has progressed three or four sub levels below the hanging. Irregularities in the enrichment adjacent to the hanging results in small isolated ore areas that have to be mined. Short slices, extra care in covering down the floors and blasting of hanging rock to form a mat all increase the cost of production. Also the ore in these areas is usually harder - more steel ore - and drilling is slower and more holes are required, hence breaking cost is higher. Often the ore has to be transferred on a lower sub level. During 1935 only a few areas of this character were mined above the 6th level but in 1936 a larger number will doubtless be found.

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7. UNDERGROUND: (Cont'd)

g. Mining and Loading: (Cont'd)

Electric scraper hoists were used by all contracts during 1934 and 1935. The 15 H.P. hoist has been demonstrated to be the most economical unit and new purchases will be of this size unit. An increase in production with no change in working time would make it necessary to buy additional hoists. The present product with one crew of men instead of two would double the number of scraper units required and make it necessary to purchase nearly twenty (20) new ones.

h. Ventilation:

Forced ventilation at the Athens is provided by a 40,000 cu. ft. fan located on the bottom or 10th level which uses the cage compartment of the shaft for a suction. The air is forced upward from the 10th level to the 4th where it returns to the shaft and thence to surface via the skip compartments. The cage compartment is sealed off from the skip roads by a gunite seal. The 10th to 9th level airways consists of one raise in ore close to mined out Block No. 1 and one concreted raise in rock near to the shaft. The 9th to 8th, 8th to 6th and 6th to 4th airways are all raises in ore. Nearly all of the ore raises have been recribbed many times, several are partly crushed and some are in the areas soon to be mined. It was decided to put up new airway raises in rock from the 10th to 6th levels and one in ore from the 6th to 4th levels. Where rock conditions permit it was planned to make the raises 8' x 8' in size and to gunite them to prevent slabbing. A start on this important work was made late in the year after the enlargement of the sump was completed. At the end of the year a rock raise was being put up from the 10th to 9th levels and an ore raise from the 6th to 4th levels. Area of the airway raises between these levels are restricted more than the others and will be given attention first. On completion of these two raises, permanent airway raises in rock, from the 9th to 8th levels and the 8th to 6th levels, will be completed. After these raises are finished it is expected that no great expense for maintenance of airways will be necessary for many years.

i. Pumping:

A pump was installed in the Breitung shaft of the Jones & Laughlin Steel Company in January together with suction and an 800' 6" discharge line on surface, also a transmission line from the Athens engine house to the Breitung shaft. Pumping started in February at the water level, 50 ft. below the collar of the shaft. During the month the pump was lowered three times and on March 1st, it was located 76 ft. below the collar of the shaft with the suction extending 20 ft. below or 96 ft. below the collar. The pump was operated two shifts from February 1st to 26th, after which it was run eight hours per day. This schedule was maintained for the next several months, the water being held stationary during this period 12 $\frac{1}{2}$ ft. below the pump or approximately 88 ft. below the collar of the shaft. With respect to elevation of the ledge in the shaft, the water was held 20 ft. below it. In May an E. & A. was approved for purchase of a 440 V., 600 gal., 125 ft. head, automatic centrifugal pump to replace the large 2200 V., 1000 gal. pump that was in use. Pumping was continued during May, June and

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7. UNDERGROUND: (Cont'd)

i. Pumping: (Cont'd)

until late in July when the new pump was installed 8 ft. lower in the shaft or 84 ft. below the collar. It required nearly two months to get the automatic pump operating satisfactorily. It was lowered once more and is now located approximately 100 ft. below the collar with 20 ft. suction. It holds the water about 110 ft. below the collar or approximately 42 ft. below ledge. The last three months of the year the pump only required an occasional oiling and inspection. The current used by the new pump is materially less than was used by the larger pump, this is now the main item of cost for pumping the shaft. Including supplies, oil, grease and waste and inspection expense it is now only costing approximately \$50.00 per month to keep the water down 110 ft. below the collar of the Breitung shaft.

The results of pumping at this shaft and at the Athens is clearly shown by the following statement:

| <u>Period</u> | <u>Avg. K.W.Per Day - Athens</u> | <u>K.W.Per Month Breitung Pump</u> | <u>Avg.Gals.Per Min. -Athens</u> | 1935 | | 1934 |
|--------------------|----------------------------------|------------------------------------|----------------------------------|------------------------------|--------------------|------|
| | | | | <u>Total Cost Both Mines</u> | <u>Athens Cost</u> | |
| Jan. | | | 369 | (1) 2913.88 | 2414.63 | |
| Feb. | 4067 | 8700 | 361 | 3128.27 | 2288.26 | |
| Mar. | 3466 | 9000 | 313 | 2684.68 | 2327.63 | |
| April | 3316 | 10900 | 292 | 2525.24 | 2375.84 | |
| May | 3332 | 12500 | 290 | 2506.92 | 2660.07 | |
| June | 3350 | 10400 | 293 | 2499.14 | 2833.26 | |
| July | 3305 | 9100 | 288 | 2326.39 | 2804.94 | |
| Aug. | 3238 | 4500 | 278 | 2390.55 | 2704.71 | |
| Sept. | 3112 | 4100 | 263 | 2207.37 | 2639.26 | |
| Oct. | 3037 | 3100 | 261 | 2061.41 | 2845.03 | |
| Nov. | 2997 | 2700 | 253 | 1967.75 | 2704.84 | |
| Dec. | <u>2932</u> | <u>2700</u> | <u>249</u> | (a) <u>1529.29</u> | <u>2742.20</u> | |
| Avg. 11 | | | | | | |
| Mos.-1935 | 3286 | 5518 | 285½ | 2329.72 | | |
| Avg. 12 | | | | | | |
| Mos.-1934 | | | | | 2611.79 | |
| Avg. last 6 Months | | | 265 | 2087.93 | | |

(1) Athens Mine only.

(a) Cost of current in December decreased approximately 30% account of credit for Michigan sales tax for period May 1st, 1934 to June 1st, 1935.

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7. UNDERGROUND: (Cont'd)

i. Pumping: (Cont'd)

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

| <u>Month</u> | <u>1935</u> | <u>1934</u> | <u>1933</u> | <u>1932</u> | <u>1931</u> | <u>1930</u> |
|--------------|-------------|-------------|-------------|-------------|-------------|-------------|
| January | 369 | 318 | 373 | 278 | 243 | 230 |
| February | 355 | 317 | 358 | 286 | 244 | 230 |
| March | 313 | 313 | 340 | 296 | 250 | 233 |
| April | 292 | 307 | 326 | 307 | 253 | 231 |
| May | 290 | 329 | 365 | 312 | 255 | 228 |
| June | 293 | 361 | 416 | 326 | 282 | 228 |
| July | 288 | 373 | 422 | 597 | 262 | 222 |
| August | 278 | 360 | 411 | 542 | 263 | 234 |
| September | 263 | 356 | 399 | 486 | 262 | 239 |
| October | 261 | 354 | 356 | 431 | 263 | 233 |
| November | 253 | 355 | 342 | 402 | 268 | 239 |
| December | <u>249</u> | <u>355</u> | <u>326</u> | <u>391</u> | <u>274</u> | <u>242</u> |
| Average | 292 | 341½ | 369½ | 396 | 260 | 232 |

The average water pumped per minute at the Athens in the last four months was approximately the same as in 1931 prior to the cave to surface. It is hoped that there will be a further decrease at least during the winter months to about the old average of 225 gallons per minute.

The enlargement and cleaning of the 10th level sump was not completed until the last week of the year so that the saving in labor expense due to elimination of one 8-hour pumping shift did not effect the costs for the year.

j. Shaft:

Maintenance of the concrete shaft was normal for the year but about \$190.00 more than in 1934. Repairs consisted of a few new steel members, resetting of some brackets, bolts to replace loose rivets and loose or broken bolts, new strips on skip guides and replacement of a few guides that were badly worn. A few sections of the casing between the cage and skip compartments were gunited to close cracks and spaces from which the old gunite had been knocked off. Under account "Shaft" was also charged the expense of enclosing the transfer raises at the shaft, from 6th to 8th levels, at the point where they reverse direction on the 7th level. This involved making two concrete boxes 8' x 10' x 12' high across the opening on the 7th level, providing necessary reinforcement, doors, etc. The cost was approximately \$800.00. They guide the ore across the 7th level and prevent the level filling with ore which heretofore cut off access to the raises when they blocked.

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8. COST OF OPERATING:

a. Comparative Mining Costs:

| | <u>1935</u> | <u>1934</u> | <u>Increase</u> | <u>Decrease</u> |
|-----------------------|--------------|--------------|-----------------|-----------------|
| PRODUCT: | 192,534 | 162,706 | 29,828 | |
| Underground Costs | 1.345 | 1.266 | .079 | |
| Surface Costs | .215 | .248 | | .033 |
| General Mine Expenses | .205 | .264 | | .059 |
| Cost of Production | 1.765 | 1.778 | | .013 |
| Taxes | .308 | .341 | | .033 |
| TOTAL COST | 2.073 | 2.119 | | .046 |

COST OF PRODUCTION:

| | <u>1935</u> | <u>%</u> | <u>1934</u> | <u>%</u> | <u>Increase</u> | <u>Decrease</u> |
|--------------|--------------|--------------|--------------|--------------|-----------------|-----------------|
| Labor | .976 | 55.3 | .917 | 51.5 | .059 | 3.8% |
| Supplies | .789 | 44.7 | .861 | 48.5 | | .072 3.8% |
| Total | 1.765 | 100.0 | 1.778 | 100.0 | | .013 |

b. Detailed Cost Comparison:

| (1) <u>Days and Shifts:</u> | | | <u>Shifts &</u> | | <u>Total</u> |
|-----------------------------|-------------------------|--------------|---------------------|--------------------------------------|--------------|
| <u>Year</u> | <u>Days Mine Worked</u> | <u>Hours</u> | <u>Men Employed</u> | <u>Shifts Worked</u> | |
| 1935 | 303 | 1-8 | 213 | 38,909 $\frac{1}{2}$ | |
| 1934 | 273 | 1-8 | 193 | 31,380 $\frac{1}{2}$ | |
| Increase | 30 | | 20 | 7,529$\frac{1}{2}$ | |

(2) Wages:

There was a 10% increase in wages effective April 1st, 1934.

(3) Comparison of Production:

| | |
|-------------------|---------------|
| Production - 1935 | 192,534 |
| Production - 1934 | 162,706 |
| Increase | 29,828 |

(4) Comparison of Number of Men and Wages:

| | <u>No. Men</u> | <u>No. Days</u> | <u>Amount</u> | <u>Rate Per Day</u> |
|-----------------|----------------|--------------------------------------|------------------|---------------------|
| 1935 | 213 | 38,909 $\frac{1}{2}$ | 182,736.91 | 4.70 |
| 1934 | 193 | 31,380 $\frac{1}{2}$ | 143,657.64 | 4.58 |
| Increase | 20 | 7,529$\frac{1}{2}$ | 39,079.27 | .12 |

(5) Tons Per Man Per Day:

| | <u>1935</u> | <u>1934</u> | <u>Increase</u> | <u>Decrease</u> |
|--------------|-------------|-------------|-----------------|-----------------|
| Surface | 20.12 | 20.27 | | .15 |
| Underground | 6.56 | 6.97 | | .41 |
| Total | 4.95 | 5.18 | | .23 |

(6) Cost of Production:

| | | | |
|-----------------|------------------|-----------------|-------------|
| 1935 | 339,949.82 | Cost Per Ton | 1.765 |
| 1934 | 289,236.51 | Cost Per Ton | 1.778 |
| Increase | 50,713.31 | Decrease | .013 |

| | <u>Labor</u> | <u>%</u> | <u>Supplies</u> | <u>%</u> |
|-----------------|------------------|----------|------------------|----------|
| 1935 | 187,999.48 | 55.3 | 151,950.34 | 44.7 |
| 1934 | 149,229.71 | 51.5 | 140,006.80 | 48.5 |
| Increase | 38,769.77 | | 11,943.54 | |

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

| | 1935 | | 1934 | | <u>Increase</u> | | <u>Decrease</u> | |
|--------------------------------|-----------|-------|-----------|-------|-----------------|------|-----------------|------|
| | 4 & 6 | 1-8 | 4 & 6 | 1-8 | | | | |
| | 192,534 | 635 | 162,706 | 596 | 29,828 | 39 | | |
| | 303 | | 273 | | 30 | | | |
| | Per | Per | Per | Per | Per | Per | Per | Per |
| | Amount | Ton | Amount | Ton | Amount | Ton | Amount | Ton |
| <u>Underground Costs:</u> | | | | | | | | |
| 1. Exploring in Mine | 82.07 | .000 | 61.50 | .000 | | | | |
| 2. Sinking in Shaft | | | | | | | | |
| 3. Development in Rock | 7130.27 | .037 | 454.76 | .003 | 6675.51 | .034 | | |
| 4. Development in Ore | 7488.12 | .039 | 575.62 | .003 | 6912.50 | .036 | | |
| 5. Stoping | 61445.27 | .319 | 53387.10 | .328 | 8058.17 | | .009 | |
| 6. Timbering | 75871.53 | .394 | 64267.99 | .395 | 11603.54 | | .001 | |
| 7. Trammig | 19733.45 | .102 | 16525.49 | .102 | 3207.96 | | | |
| 8. Ventilation | 4904.16 | .026 | 5722.45 | .035 | | | 818.29 | .009 |
| 9. Pumping | 28740.89 | .149 | 31341.47 | .193 | | | 2600.58 | .044 |
| 10. Comp. & Air Pipes | 24641.51 | .128 | 18094.60 | .111 | 6546.91 | .017 | | |
| 11. Back Filling | | | | | | | | |
| 12. Undg. Superintendence | 7093.27 | .037 | 6504.47 | .040 | 588.80 | | | .003 |
| 13. Cave-in | | | | | | | | |
| 14. Maint:Comp.& P.Drills | 1932.69 | .010 | 215.68 | .001 | 1717.01 | .009 | | |
| 15. Scraper Equipment | 7553.25 | .039 | 4648.36 | .029 | 2904.89 | .010 | | |
| 16. Elec.Tram Equip. | 6843.87 | .036 | 3237.85 | .020 | 3606.02 | .016 | | |
| 17. Pumping Machy. | 5571.08 | .029 | 944.39 | .006 | 4626.69 | .023 | | |
| Total Undg. Costs | 259031.43 | 1.345 | 205981.73 | 1.266 | 53049.70 | .079 | | |
| <u>Surface Costs:</u> | | | | | | | | |
| 18. Hoisting | 19052.12 | .099 | 17561.67 | .108 | 1490.45 | | | .009 |
| 19. Stocking Ore | 2939.84 | .015 | 2873.60 | .018 | 66.24 | | | .003 |
| 20. Screening-Crushing at Mine | | | | | | | | |
| 21. Dry House | 4378.91 | .023 | 3875.47 | .024 | 503.44 | | | .001 |
| 22. Gen.Surface Expense | 4692.91 | .024 | 4699.51 | .029 | | | 6.60 | .005 |
| 23. Maint: Hoisting Equipment | 5620.20 | .029 | 5768.52 | .035 | | | 148.32 | .006 |
| 24. Shaft | 2023.59 | .010 | 1002.75 | .006 | 1020.84 | .004 | | |
| 25. Top Tram Equipment | 1103.51 | .006 | 1272.86 | .008 | | | 169.35 | .002 |
| 26. Docks,Trestles,&Pkts | 925.85 | .005 | 2623.16 | .016 | | | 1697.31 | .011 |
| 27. Mine Buildings | 751.72 | .004 | 606.05 | .004 | 145.67 | | | |
| Total Surface Costs | 41488.65 | .215 | 40283.59 | .248 | 1205.06 | | | .033 |
| <u>General Mine Expenses:</u> | | | | | | | | |
| 28. Insurance | 441.40 | .002 | 250.16 | .002 | 191.24 | | | |
| 29. Mining Engineering | 997.68 | .005 | 1252.38 | .008 | | | 254.70 | .003 |
| 30. Mech. & Elec. Engr. | 1487.97 | .008 | 1285.76 | .008 | 202.21 | | | |
| 31. Analysis and Grading | 5387.47 | .028 | 4164.34 | .026 | 1223.13 | .002 | | |
| 32. Personal Injury | 8321.55 | .043 | 11621.74 | .071 | | | 3300.19 | .028 |
| 33. Safety Department | 563.34 | .003 | 493.95 | .003 | 69.39 | | | |
| 34. Tel.& Safety Devices | 1707.20 | .009 | 1419.91 | .009 | 287.29 | | | |
| 35. Local & Gen. Welfare | | | | | | | | |
| 36. Spec.Exp.,Pen. & Allow. | 4771.59 | .025 | 5384.38 | .033 | | | 612.79 | .008 |
| 37. Ishpeming Office | 4273.27 | .022 | 4536.24 | .028 | | | 262.97 | .006 |
| 38. Saranac Investigation | 1407.10 | .007 | 2561.55 | .016 | | | 1154.45 | .009 |
| 39. Mine Office | 10071.17 | .053 | 10000.78 | .060 | 70.39 | | | .007 |
| Total Gen.Mine Expenses | 39429.74 | .205 | 42971.19 | .264 | | | 3541.45 | .059 |
| COST OF PRODUCTION | 339949.82 | 1.765 | 289236.51 | 1.778 | 50713.31 | | | .013 |
| 40. Taxes | 59335.80 | .308 | 55518.55 | .341 | 3817.25 | | | .033 |
| TOTAL COST | 399285.62 | 2.073 | 344755.06 | 2.119 | 54530.56 | | | .046 |

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8. COST OF OPERATING: (Cont'd)

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

UNDERGROUND COSTS:

1. Exploring in Mine:

Covers a Proportion of Expense of Geological Dept. based on actual time spent at property. The Expense of this Department increased in 1935, resulting in Athens standing a slightly higher charge.

3. Development in Rock:

Increase of 655 ft. drifting and raising in 1935 account of development of new mining area (west half of Block No. 4) above the 6th level. Stripping of the two transfer raises at the shaft from the 6th to 8th levels (footage equivalent to 100 ft. of 8' x 8' raise) was also charged to this account.

4. Development in Ore:

Increase of 968 ft. drifting and raising in 1935 account of development of new mining area (west half of Block No. 4) above the 6th level.

5. Stoping:

Labor cost increased \$6,394.72 and supply cost \$1,663.45 due to 30 more working days in 1935. Cost per ton decreased \$.009 in spite of an increase in explosive cost per ton of \$.0036. Tons per man per day stoping in 1935 were 22.38 as compared with 22.20 tons in 1934 or .18 tons higher. Cost per ton stoping has decreased from \$.424 in 1929 to \$.319 in 1935 or \$.105 per ton.

6. Timbering:

Cost per ton timbering for the two years was practically equal. The cost is above normal in both years due to shut downs in 1932 and 1933 and low operating schedule and production since. Recribbing of raises and replacement of rotted timber sets on the main levels was the main item that caused the increase. Timbering cost per ton averaged \$.3055 per ton in 1929 and 1930, increased to \$.3495 in 1931 and 1932 and in 1934 and 1935 averaged \$.3945. Cost per ton for timber, lagging and poles was \$.1173 in 1935 as compared to \$.1201 in 1934 or \$.0028 per ton lower. The heavy raising program in 1935 increased the amount of cribbing timber used and the new cross-cut on 6th level, the amount of treated timber used.

7. Tramming:

Same cost per ton in 1935 and 1934. Increase in expenditures due to mine operating 30 more days.

8. Ventilation:

Decrease in cost for electric current was \$589.73 in 1935. The cost per K.W. was lower and the fan was idle part of the time while the sump on 10th level was enlarged and cleaned. There was a charge of \$304.00 in 1934 for a 40,000 cu. ft. fan purchased from the Armour No. 2 equipment. This fan replaced the main fan on the 10th level which was worn out.

9. Pumping:

Expense decreased \$2600.58 in 1935 and cost per ton \$.044. Gallons of water pumped at Athens decreased 23,342,892. Pumping at the Breitung shaft started in February - see paragraph under heading "7-i. Pumping", for more detail.

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8. COST OF OPERATING: (Cont'd)

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

UNDERGROUND COSTS: (Cont'd)

10. Compressors and Air Pipes:

Expenditures increased \$6,546.91 and cost per ton \$.017.

| | |
|-------------------------------|--------------------|
| Cu. ft. air compressed - 1935 | 527,355,000 |
| Cu. ft. air compressed - 1934 | <u>334,485,000</u> |
| Increase | 192,870,000 |

The increase in cubic feet of air compressed was 57%. The compressor operated night shift during the time the raises at the shaft were being stripped from the 6th to 8th levels and during the time the sump was being enlarged and cleaned. Both of these jobs were in hard rock which increased the drilling time and consumption of air. The mine also operated 30 more days in 1935. Cost for electric current for operating the compressor in 1935 was \$17,661.48, in 1934 in was \$12,290.56 - the increase was \$5,370.92 in cost per ton it was \$.016.

12. Underground Superintendence:

Increase due to mine operating 30 more days and more extra time account of night shift work.

14. Maintenance - Compressors and Power Drills:

Increase of \$1717.01 accounted for as follows:

| | |
|--|---------------|
| New drill machines purchased | \$ 1460.00 |
| Rebuilding intercooler on Ingersoll-Rand compressor | <u>320.00</u> |
| Total | \$ 1780.00 |

15. Maintenance - Scrapers and Mechanical Loaders:

Increase of \$2904.89 due mainly to payment of \$2000.00 in 1935 for four (4) second-hand 15 H.P. Sullivan electric scraper hoists received from Wade Mine equipment in 1933. There was also more expense for scraper rope and general repairs to scraper equipment account of mine operating 30 more days in 1935.

16. Maintenance - Electric Tram Equipment:

Increase in expense for main line tracks due to replacing 30-lb. rail on 8th level haulage track to shaft with 40-lb. rail and tie plates (old rail was worn and had to be replaced), also track in new cross-cut on 6th level. A regular trackman was employed in 1935, none in 1934. Increase in expense for main line cars due to overhauling 18 cars in the mine shop. These two items account for \$3289.18 of the increase of \$3606.02 for the year. Generator and locomotive repairs were slightly higher in 1935 and the balance of increase was in sub-account "wiring" due to installation of trolley in new cross-cut on the 6th level.

17. Maintenance - Pumping Machinery:

Driving a drift for cleaning and enlarging the capacity of the 10th level sump, also expense of cleaning the sump accounts for most of the increase. There was also expense account of installation of pump at the Breitung shaft.

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8. COST OF OPERATING: (Cont'd)

b. Detailed Cost Comparison: (Cont'd)

(7) Detail of Accounts:

SURFACE COSTS:

18. Hoisting:

Increase in tons of ore and rock hoisted of 39,403 accounts for the increase. Due to lower cost per K.W. for current and more ore and rock hoisted the cost per ton decreased from \$.108 to \$.099 or \$.009.

19. Stocking Ore:

102,368 tons stocked in 1935.
101,018 tons stocked in 1934.
1,350 tons increase

Mine operated 30 more days in 1935.

21. Dry House:

Increase in labor cost and fuel account of mine operating 30 more days in 1935.

22. General Surface Expense:

Expense for the two years was practically the same. More accurate distribution of surface foreman's time in 1935 decreased charge to "General Surface Expense".

23. Maintenance - Hoisting Equipment:

Slight decrease in 1935 due to less expense for hoisting ropes. In 1935 - one 1-3/8" skip rope, costing \$1456.34, was charged out. In 1934 one 1-3/8" skip rope costing \$1448.01 and \$745.11 balance on new 1-1/4" cage rope was charged. Total decrease in charge for ropes in 1935 - \$736.78. Expense for repair of electric hoists was \$46.50 higher, skips and skip roads \$599.58 higher and sheaves \$57.62 lower. Net decrease in 1935 - \$148.32.

24. Maintenance - Shafts:

Steel sets repairs were \$188.36 higher and underground pocket repairs \$832.48 higher. The main part of the expense charged to underground pockets was for enclosing the two transfer raises 6th to 8th levels at the shaft across the opening on the 7th level. The 10th level pocket was also repaired and altered for dumping the rocker dump cars.

25. Maintenance - Top Tram Equipment:

Repairs to motors, sheaves and rollers showed slight decreases in 1935. The main decrease was due to no top tram wire rope purchased during 1935 while in 1934 expense for wire rope was \$400.89. Expense for tracks and cars increased due to overhauling three of the five top tram cars and more expense for maintenance of tracks on the rock dump.

26. Maintenance - Docks, Trestles and Pockets:

Decrease due to unusual expense in 1934 for replacing decking timber on southwest permanent steel trestle.

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8. COST OF OPERATING: (Cont'd)

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

SURFACE COSTS: (Cont'd)

27. Mine Buildings:

Detail for 1935 and 1934 follows:

| | <u>1935</u> | <u>1934</u> |
|---------------|---------------------------|---|
| Office | - | \$ 181.88 - redecorating and new lights |
| Warehouse | - | 84.48 - " " " " |
| Shops | \$ 195.95 - Roof repairs | 12.61 |
| Shaft House | - | 14.04 |
| Engine House | 173.01 " " | 86.29 - Roof repairs |
| Boiler House | 7.02 | - |
| Dry House | 182.41 - " " | 226.75 - (Making hospital room into |
| Storage Bldg. | 157.88 - (Making one room | - |
| | | (change room for Capt., |
| | | (Engineers & Superintendent |
| | | (into garage for |
| | | (mine truck. New |
| | | (door, etc. |
| Timber Tunnel | 35.89 - (Repair doors in | - |
| | \$ 751.72 (timber yard. | \$ 606.05 |

28. Insurance:

Covers cost of Fire and Boiler and Auto Insurance. Increase in 1935 over 1934 is due to increase in valuation due to coverage being "blanketed" instead of "specific".

29. Mining Engineering:

Covers time and expense of engineers actually spent at property. The decrease over 1934 is due to the engineers spending less time underground in 1935.

30. Mechanical and Electrical Engineering:

Covers a proportion of Mechanical Electric Engineering Department based on actual time spent at property. Increase due to installation and repairs of pumps in connection with pumping at Breitung Hematite Shaft to hold surface water below break in Ledge at Athens Mine.

31. Analysis and Grading:

More determinations account of more ore shipped and longer operating period.

32. Personal Injury:

This represents 2% of Payroll Labor for compensation and .08¢ per \$100.00 labor for catastrophe plus compensation payments made for accidents occurring prior to May 1933. From May 15th, 1933 to May 15th, 1934 Compensation Insurance was carried with outside parties and the increase in 1934 is due to premium paid as well as compensation paid on cases prior to May 15th, 1933.

33. Safety Department:

Proportion of expenses of our Safety Department and charge is based on labor. The small increase is due to increase in expense of department in 1935 over 1934.

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8. COST OF OPERATING: (Cont'd)

b. Detail Cost Comparison: (Cont'd)

(7) Detail of Accounts:

34. Telephones and Safety Devices:

More expense for lighting levels account new cross-cut on 6th level and work on shaft raises and sump. Fire equipment expense includes the purchase of five acid fire extinguishers.

36. Special Expense, Pensions and Allowances:

Covers special donations, dues and assessments in Lake Superior Iron Ore Association and Donated House Rents. The decrease in 1935 over 1934 is due largely to men being able to pay their rent in 1935 on account of working additional time.

37. Ishpeming Office Expense:

Proportion of Ishpeming Office Expense prorated to various mines on basis of labor.

GENERAL MINE EXPENSES:

38. Saranac Investigation:

Represents examination of men at \$4.00 per man of men actually employed at this mine, also a proportion of cost of Saranac Laboratory contract which is prorated on a labor basis. The expense in 1933 was carried over to 1934 when it was charged off resulting in the large expense in 1934.

39. Mine Office:

Practically no change in expense.

40. Taxes:

Taxes paid in 1935 and 1934 were as follows:

| | <u>1935</u> | <u>1934</u> |
|--------------------|-----------------|-----------------|
| City Tax | \$ 59,335.80 | \$ 55,518.55 |
| Capital Stock Tax | 146.00 | 200.00 |
| Ohio Franchise Tax | <u>1,564.05</u> | <u>1,690.77</u> |
| Total | \$ 61,045.85 | \$ 57,409.32 |

The city tax rate increased \$4.018 per \$1000.00 valuation.

9. EXPLORATIONS AND FUTURE EXPLORATIONS:

There was no diamond drilling on the Athens property in 1935 and none is contemplated at this time.

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10. TAXES:

A comparison of assessed valuations and taxes for 1935 and 1934 follows:

| <u>Description</u> | <u>1 9 3 5</u> | | <u>1 9 3 4</u> | |
|--------------------------------------|------------------|--------------|------------------|--------------|
| | <u>Valuation</u> | <u>Taxes</u> | <u>Valuation</u> | <u>Taxes</u> |
| Realty (Tax Commission) | 1,490,000 | 45,942.66 | 1,675,000 | 44,893.85 |
| Ore in Stock, Equip. Etc. | 410,000 | 12,641.94 | 370,000 | 9,916.85 |
| Total by Tax Commission | 1,900,000 | 58,584.60 | 2,045,000 | 54,810.70 |
| Sterling Addition | 4,140 | 127.66 | 4,600 | 123.30 |
| Harvey Plat | 1,170 | 36.03 | 1,300 | 34.86 |
| Total | 1,905,310 | 58,748.29 | 2,050,900 | 54,968.86 |
| Collection Fees | | 587.51 | | 549.69 |
| Total Optg. Athens Mine | 1,905,310 | 59,335.80 | 2,050,900 | 55,518.56 |
| <u>Rented Buildings:</u> | | | | |
| Harvey Plat | 3,780 | 116.57 | 4,200 | 112.59 |
| Sterling Addition | 20,430 | 629.99 | 22,700 | 608.49 |
| Total | 24,210 | 746.56 | 26,900 | 721.08 |
| Collection Fees | | 7.47 | | 7.21 |
| Total Athens Rented Bldgs. | 24,210 | 754.01 | 26,900 | 728.29 |
| Total Athens Iron Mining Co. | 1,929,520 | 60,089.81 | 2,077,800 | 56,246.84 |
| Tax Rate | | 3.082 | | 2.6802 |
| Total Tax - City of Negaunee | | 366,574.10 | | 339,407.51 |
| Athens Iron Mining Co. % of City Tax | | 16.39% | | 16.57% |

The assessed valuation of the Athens Mine was reduced \$185,000 in 1935 and the personal property increased \$40,000 making net decrease \$145,000. The valuation of the other lands and rented buildings was reduced 10% by the Board of Review of the City of Negaunee which blanket decrease also applied to all real and personal property in the city. The total city tax increased \$27,166.59 with a tax rate \$4.018 higher per \$1000 valuation. The Athens Mine tax in 1935 was \$3,842.97 higher than in 1934 but the percentage of city tax paid by the Athens was .18% lower.

11. ACCIDENTS
AND
PERSONAL
INJURY:

The following statement shows accidents for the years 1931 to 1935 inclusive. There were three lost time accidents in 1935. Fortunately only one of the accidents caused a loss of time of over four months. Two of the accidents occurred to men putting up raises and one in the new cross-cut on the 6th level.

| | <u>1935</u> | <u>1934</u> | <u>1933</u> | <u>1932</u> | <u>1931</u> |
|---------------------------|-------------|-------------|-------------|-------------|-------------|
| Fatal | 0 | 0 | 0 | 0 | 0 |
| Time lost - Over 4 Months | 1 | 1 | 0 | 2 | 1 |
| " " - 1 to 4 " | 2 | 0 | 1 | 0 | 1 |
| " " - Less than 1 Month | 0 | 0 | 0 | 0 | 0 |
| Total Accidents | 3 | 1 | 1 | 2 | 2 |

| | | | | | |
|--|---|---|----|----|----|
| Number of cases paid compensation for accidents prior to Jan. 1st of each year | 7 | 7 | 14 | 14 | 12 |
|--|---|---|----|----|----|

| | | | | | |
|--|---|---|---|---|---|
| Number of cases paid difference in wages (included in above total) | 4 | 4 | 4 | 4 | 5 |
|--|---|---|---|---|---|

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12. NEW
CONSTRUCTION
AND
PROPOSED NEW
CONSTRUCTION:

E. & A. No. 670 was authorized on June 3rd, 1935 for purchase of a 600 gal. 125 ft. head centrifugal pump equipped with automatic starting and stopping device, for pumping the Breitung Shaft. The pump was received in July and after removal of the 1000 gal. 1000 ft. head pump from the shaft it was installed. Considerable trouble was experienced in getting it to start automatically although it would stop without trouble. This difficulty was finally overcome and for the last three months of the year the pump operated satisfactorily and was inspected and oiled twice a week.

Installation of unit heaters in the dry house to replace the steam pipes is contemplated when economic conditions warrant the expenditure. To get the maximum saving in heating cost, the change rooms should be ceiled at the height of the side walls.

An E. & A. covering building of a double deck cage to replace the present cages (one in service, one in reserve) is contemplated when conditions warrant. The double deck cage will be no heavier than the present single deck cage due to use of aluminum instead of steel. The double deck cage will reduce time required to hoist and lower men and will speed up delivery of supplies underground. Trips made by the cage will be decreased with a consequent saving in electric current consumption. Most mines over 2000 ft. in depth are equipped with double deck cages.

13. EQUIPMENT
AND
PROPOSED
EQUIPMENT:

a. Steam Shovels:

The 171,674 tons shipped from stockpiles in 1935 were loaded by No. 42 shovel. This steam shovel was rented to the Athens Iron Mining Company by The Cleveland-Cliffs Iron Company. It is in good condition and no special repairs are contemplated this winter.

b. Stockpile Trestles:

The wood trestle at the end of the southeast steel trestle was dismantled in the summer as it was in bad condition due to rotting of legs.

Considerable expense was incurred on the rock trestle on account of hoisting an unusual amount of rock. It consisted mainly of maintenance of tracks which were moved off the wood trestle onto the rock pile. Extensive blocking was necessary to keep the tracks in alignment.

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13. EQUIPMENT
AND
PROPOSED
EQUIPMENT: (Cont'd)

c. Scraper Hoists:

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

| | On Hand <u>1-1-1935</u> | Purchased <u>1935</u> | Total on Hand <u>12-31-35</u> |
|---------------------------------|----------------------------|--------------------------|----------------------------------|
| Sullivan 15 H.P. Electric | 15 | 0 (a) | 15 |
| Sullivan 20 H.P. Electric | 2 | 0 | 2 |
| Ingersoll-Rand 10 H.P. Electric | <u>2</u> | <u>0</u> | <u>2</u> |
| Total | <u>19</u> | <u>0</u> | <u>19</u> |

(a) Four of the 15 H.P. Sullivan hoists were received in 1933 as second-hand equipment from the Wade Mine but they were not billed and paid for until in 1935. They have been shown as on hand since 1933.

An E. & A. covering purchase of one 15 H.P. Sullivan hoist was authorized in December 1935 for delivery early in 1936.

The old 6½ H.P. Sullivan electric hoist was converted into a single-drum hoist to use with a belt drive to run a grindstone in the mine. This was the second unit converted to this use. A large number of the Ingersoll-Rand air scraper hoists have been made over into single-drum timber hoists and are now in use in the mine. Repair costs of the electric scraper hoists in service are increasing due to long service and it is now necessary to keep several spare hoists on hand to avoid serious interruptions to production.

d. Drill Machines:

Practically no drill machines have been purchased at this mine for several years. This year the rock work on 6th and 10th levels made it necessary to purchase modern rock drill machines for both drifting and raising. The old auger drill machines bought between 1920 and 1930 are wearing out and a few late model machines were purchased. Additional auger drill machines will be required in 1936.

The following new drill equipment was purchased in 1935:

| | |
|--|---------------|
| 1 - N-72 Ingersoll-Rand drill - used for rock drifting | \$ 375.00 |
| 1 - S-49 Jack stoper (Raising drill) used in rock raises | 300.00 |
| 1 - S-49 Jack hammer drill (Sinker) used in stripping raises | 215.00 |
| 3 - RB-12 Jack Hammer drills - used in mining | <u>570.00</u> |
| Total new drill machines purchased in 1935 | \$ 1460.00 |

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13. EQUIPMENT
AND
PROPOSED
EQUIPMENT: (Cont'd)

d. Drill Machines: (Cont'd)

Comment is made under this heading of the adoption for hard rock of 1-1/4" jack rods and jack bits to replace ordinary drill steel. There was no hollow drill steel on hand at the mine as no development work in hard rock had been done since the mine opened in 1917. The ground in the raises at the shaft was very hard and several tons of drill steel would have had to be purchased and made up into drills to have provided the required amount of steel. The same is true of the drift driven on the 10th level to enlarge the sump. Only about 40 jack rods were required instead of 300 to 400 pieces of drill steel so that there was a material saving in both labor for making drills, in sharpening and in expenditure for purchase of new drill steel.

Jack rods and bits are also in use in the rock ventilation raise being put up from the 10th to 9th levels. The steel used here is 7/8" hollow hexagon with 1-1/8" jack bits. The ground is quite hard and difficult to break and a large amount of regular drill steel would have been required.

14. MAINTENANCE
AND REPAIRS:

Expenditures in 1935 for maintenance and repairs increased materially in all the accounts on the cost sheet under the heading "Underground Costs".

Account "Compressors and Power Drills" increased \$1717.00 due to purchase of six drill machines costing \$1460.00 and rebuilding of the inter-cooler on the Ingersoll-Rand compressor at a cost of \$320.00.

Account "Scrapers and Mechanical Loaders" increased \$2905.00 due to payment of \$2000.00 in 1935 for four second-hand 15 H.P. Sullivan scraper hoists received at the mine in 1933 from the Wade Mine equipment. Repairs to scraper hoists were much more extensive than in prior years, also more expense for rebuilding scrapers, head and snatch blocks, etc.

Account "Electric Tram Equipment" was \$3600.00 higher in 1935. This was largely due to labor and material for repair of haulage tracks. No expense had been incurred for this work in several years and it could no longer be delayed. Considerable worn rail was replaced with new rail together with new ties and tie plates. The track in the new cross-cut on the 6th level was charged to this account. During the last five months of the year 18 tram cars were brought to surface and overhauled in the mine shop.

Account "Pumping Machinery" carries the expense for clean-out drift and enlarging of sump on the 10th level, also the cost of cleaning the old sump. This work cost approximately \$4500.00

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14. MAINTENANCE
AND REPAIRS: (Cont'd)

After the reduction in working time several years ago and employment of two crews of men, there was an excess of equipment available as only half as many working places were required. During the following three years this excess equipment was used up and purchases held to a minimum. However, in 1935 it became necessary to make larger purchases of many items among which were drill steel, pipe, air hose, vent tube, drill machines, rail, etc. Repairs to equipment in constant use, such as drill machines, scraper hoists, etc., were also much heavier in 1935.

The total increase in maintenance accounts under "Underground Costs" amounted to \$12,864.61.

Surface maintenance expense in 1935 was slightly lower than in 1934.

Shaft maintenance expense increased due to enclosing the two transfer raises from 6th to 8th levels, across the opening on the 7th level. The transfer raises reverse direction at the 7th level elevation and heretofore the whole level would fill with ore and prevent access to the raises when they blocked. In addition to enlarging the sections from the 7th to 8th levels from 4' x 4' to 8' x 8' in size, concrete enclosures were built to confine the ore on the 7th level and divert it into the raises from the 8th level. These enclosures were roughly 8' x 10' in size and about 12' to 14' in height. Doors were provided to give access to the raises and hitches were made to hold rail to support a platform in case it ever became necessary to clear the raises. The cost of these concrete enclosures account for the greater part of the increase in shaft maintenance expense. The cost for repair of steel sets increased \$188.00 in 1935 mainly due to rebolting a considerable number of the sets.

The main decrease in surface maintenance expense was in account "Docks, Trestles and Pockets". In 1934 most of the decking timbers on the permanent steel trestles southwest of the shaft were replaced. A small section that was not replaced was renewed in 1935. The decrease in expense in 1935 in this account was approximately \$1500.00.

Expense for repairs to buildings was slightly higher in 1935. This year the main expense was for repair of the dry house roof. The sheeting plank under the asbestos roofing had rotted in one section on the south side of the dry house. The roofing had to be removed, the rotted plank replaced, then the roofing put on again. Several gutters had to be replaced. After all repairs were completed the roof was given an application of primer and sealcote compound. These materials give new life to the asbestos roofing and also stop leaks.

The roofs of the shop building and engine house were also given an application of the roof dressing compound which stopped several leaks and added to the life of the roofing.

Total surface maintenance expense in 1935 was \$10,424.87 as compared to \$11,273.34 in 1934.

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15. POWER:

Detail of electric current purchased compared with 1934:

| | <u>1935 - 12 Mos. Optg.</u> | | <u>1934 - 12 Mos. Optg.</u> | |
|-------------------------|-----------------------------|----------------|-----------------------------|----------------|
| | <u>Cost</u> | <u>Per Ton</u> | <u>Cost</u> | <u>Per Ton</u> |
| Stopping | 510.00 | .003 | 363.60 | .002 |
| Ventilation | 3,587.69 | .018 | 4,157.42 | .026 |
| Pumping | 20,255.30 | .105 | 23,828.94 | .146 |
| Hoisting | 14,806.36 | .077 | 13,549.10 | .083 |
| Stocking Ore | 300.48 | .002 | 296.87 | .002 |
| Dry House | 61.13 | .000 | 46.33 | .000 |
| Lights at Levels | 1,116.31 | .006 | 1,000.49 | .006 |
| Compressor | 17,661.48 | .092 | 12,290.56 | .076 |
| Electric Haulage | 1,272.48 | .007 | 1,108.11 | .007 |
| Shops | 78.44 | .000 | 87.46 | .001 |
| Heating Plant | 12.27 | .000 | 12.33 | .000 |
| Office | 14.17 | .000 | 36.74 | .000 |
| Total | 59,656.11 | .310 | 56,777.95 | .349 |
| Main Line Meter | 3,986,097 K.W. | | 3,528,094 K.W. | |
| Separate Meter Readings | <u>3,968,234 K.W.</u> | | (1) <u>3,487,917 K.W.</u> | |
| Line Loss | 17,863 K.W. | | 40,177 K.W. | |

(1) May 1934 to Dec. 1934, Inc.

| | | |
|-------------------------------|-----------|---------------|
| Product | 192,534 | 162,706 |
| K.W. Per Ton (Inc. Line Loss) | 20.61 | 21.44 |
| Cost Per K.W. (Avg.) | .01503 | .01609 |
| 15 Min. Demand (Avg.) | 1127 K.W. | (1) 1150 K.W. |
| Load Factor (Avg.) | 39.4% | (1) 35.5% |

The cost per K.W. decreased .00106 in 1935 due to a lower 15 minute demand and a better load factor. A credit of \$1,867.64 was taken up in December power accounts. It represented a refund, by the State of Michigan, of the 3% sales tax collected from May 1st, 1934 to June 1st, 1935. Collection of this tax was stopped in June 1935.

16. WATER SUPPLY:

Water used at the mine is supplied by the City of Negaunee. There were no interruptions in service during the year. It is planned to pipe city water into the mine in 1936 to furnish water for drilling in rock as the underground supply of clear water has decreased since pumping started at the Breitung Shaft. The present supply is caught on the 4th level and carried in pipes to the lower levels. City water in the mine will also provide water for drinking.

17. CONDITION
OF
PREMISES:a. Mine Grounds:

More expense was incurred in 1935 for upkeep of the grounds around the mine buildings. This work had been curtailed for several years. This year the shrubbery plantations were pruned to remove dead wood and in some cases the shrubs were entirely cut back to make a new growth from the ground. The lawn was kept mowed and borders trimmed. Fertilization of lawns and shrubbery beds is badly needed as this has been postponed for several years.

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17. CONDITION
OF
PREMISES: (Cont'd)

b. Athens Mine Houses:

The houses owned by the Athens Iron Mining Company are all adjacent to the mine. Of the 30 houses, 17 are one family houses, 12 are two family and one a three family. The 30 houses are occupied by 44 families. During the past several years toilets have been installed in all the houses that have sewer and water connections. New roofs have also been put on nearly every house during the past eight years - in all cases composition shingles replaced wood shingles.

Cost of repairs in 1935 were higher than in the last few years due to all expenditures being curtailed from 1931 to 1934. In 1934 more general repairs became absolutely necessary and this was also the case in 1935. Repairs costs were 6½ times higher in 1935 than in 1932. Among the repairs made in 1935 were four new roofs, six toilets installed, siding repairs on two houses, foundation repairs on three and the balance were miscellaneous repairs to chimneys, doors, windows, plastering, etc., also interior decorating.

The following statement gives the total cost of repairs and the average cost per house for the past five years:

| <u>Year</u> | <u>Amount</u> | <u>Cost Per House</u> |
|-------------|---------------|-----------------------|
| 1935 | 2,654.73 | 88.49 |
| 1934 | 2,088.70 | 69.32 |
| 1933 | 852.41 | 28.41 |
| 1932 | 419.20 | 13.97 |
| 1931 | 391.37 | 13.04 |

All the Athens houses need paint and the longer this work is postponed the more expensive it will be. It is planned to submit estimates of the cost of exterior painting 15 houses in 1936 and the balance in 1937.

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18. NATIONALITY
OF
EMPLOYEES:

The following statements show; first, the nationality of employees as to parentage, secondly, a separation of nationalities into American and foreign born:

| <u>As to Parentage</u> | <u>1935</u> | <u>%</u> | <u>1934</u> | <u>%</u> |
|------------------------|-------------|----------|-------------|----------|
| English | 43 | 20.2 | 42 | 21.8 |
| Finnish | 87 | 40.8 | 78 | 40.4 |
| Italian | 36 | 16.9 | 28 | 14.5 |
| Swedish | 16 | 7.5 | 18 | 9.3 |
| French (Canadian) | 18 | 8.5 | 16 | 8.3 |
| Scotch | 1 | .5 | 1 | .5 |
| German | 5 | 2.3 | 5 | 2.6 |
| Austrian | 1 | .5 | 1 | .5 |
| Norwegian | 3 | 1.4 | 3 | 1.6 |
| Irish | 2 | .9 | 1 | .5 |
| Danish | 1 | .5 | - | - |
| Total | 213 | 100.0 | 193 | 100.0 |

| <u>As to Birth</u> | <u>American Born</u> | | <u>Foreign Born</u> | |
|--------------------|----------------------|-------------|---------------------|-------------|
| | <u>1935</u> | <u>1934</u> | <u>1935</u> | <u>1934</u> |
| English | 28 | 26 | 15 | 16 |
| Finnish | 42 | 36 | 45 | 42 |
| Italian | 12 | 6 | 24 | 22 |
| Swedish | 13 | 14 | 3 | 4 |
| French (Canadian) | 18 | 16 | | |
| Scotch | 1 | 1 | | |
| German | 5 | 5 | | |
| Austrian | 1 | 1 | | |
| Norwegian | 3 | 3 | | |
| Irish | 2 | 1 | | |
| Danish | 1 | 0 | | |
| Total | 126 | 109 | 87 | 84 |
| | 59.2% | 56.5% | 40.8% | 43.5% |

SOUTH JACKSON MINE
ANNUAL REPORT
YEAR 1935

1. GENERAL:

This property has now been idle for many years and it is not expected that it will ever be operated again as an open pit mine.

4. ESTIMATE
OF ORE
RESERVES:a. Available Ore:

Above present pit available by present system of mining:

| | |
|---------------------------------|----------------|
| On Southwest side | 35,000 tons |
| North of Lucy Pit | 5,000 " |
| South and Southwest of Lucy Pit | <u>3,000 "</u> |
| Total | 43,000 " |

Below present pit and above drainage tunnel available by milling:

| | |
|---|------------------|
| West of Crusher | 186,000 tons |
| Area below bottom of present pit shown by churn drilling | <u>105,226 "</u> |
| Total | 291,226 " |

Grand Total 334,226 "

c. Estimated Analysis:

| | <u>Iron</u> | <u>Phos.</u> | <u>Silica</u> | <u>Alum</u> | <u>Mang</u> | <u>Lime</u> | <u>Mag.</u> | <u>Sul.</u> | <u>Igni.</u> | <u>Moist.</u> |
|---------|-------------|--------------|---------------|-------------|-------------|-------------|-------------|-------------|--------------|---------------|
| Natural | 34.55 | .066 | 36.00 | 1.42 | 2.00 | .435 | .175 | .010 | 2.00 | 7.00 |

6. SURFACE:

There has been no watchman at this property since 1931.

10. TAXES:

| | <u>1 9 3 5</u> | | <u>1 9 3 4</u> | |
|---|------------------|----------------|------------------|----------------|
| | <u>Valuation</u> | <u>Taxes</u> | <u>Valuation</u> | <u>Taxes</u> |
| 53% of realty as described, Sec. 1-47-27 | 225,250 | 6945.36 | 225,250 | 6097.59 (a) |
| Collection Fees | | 69.45 | | |
| Total Taxes | | <u>7014.81</u> | | <u>6097.59</u> |
| City of Negaunee Tax Rate Per \$100.00 | | 3.09 | | 2.683 |

(a) Includes collection fee.

The valuation was increased \$10,600 in 1934 by the State Tax Commission.

NORTH JACKSON MINE
ANNUAL REPORT
YEAR 1935

1. GENERAL:

This property has been idle for 27 years or since 1908.

6. SURFACE:

The fences around the open pits were repaired in the early summer.

10. TAXES:

| | <u>1 9 3 5</u> | | <u>1 9 3 4</u> | |
|---|------------------|----------------|------------------|----------------|
| | <u>Valuation</u> | <u>Taxes</u> | <u>Valuation</u> | <u>Taxes</u> |
| 47% of Jackson Realty Sec. 1-47-27 | 199,750 | 6159.09 | 199,750 | 5407.30 (a) |
| Collection Fees | | 61.59 | | |
| Total Taxes | | <u>6220.68</u> | | <u>5407.30</u> |
| <u>Rented Buildings</u> | | | | |
| Old Jackson Office | <u>630</u> | 19.62 | <u>700</u> | 18.96 |
| Grand Total Taxes | | <u>6240.30</u> | | <u>5426.26</u> |
| City of Negaunee Tax Rate Per \$100.00 | | 3.09 | | 2.683 |
| (a) Includes collection fee. | | | | |

LUCY MINE
ANNUAL REPORT
YEAR 1935

1. GENERAL:

The fences around the open pits were inspected and repaired in the spring.

10. TAXES:

| | <u>1 9 3 5</u> | | <u>1 9 3 4</u> | |
|---------------------------|------------------|----------------|------------------|----------------|
| | <u>Valuation</u> | <u>Taxes</u> | <u>Valuation</u> | <u>Taxes</u> |
| Various Parcels | 38,250 | 1179.53 | 48,600 | 1302.99 |
| Collection Fees | | 11.80 | | 13.02 |
| Total Taxes | | <u>1191.33</u> | | <u>1316.01</u> |
| City of Negaunee Tax Rate | | | | |
| Per \$100.00 | | 3.09 | | 2.683 |

Valuation decreased by reduction of 10% in assessed valuation of all property in City of Negaunee and by sale of lots in Iron Plat.

GARDNER MACKINAW MINE
ANNUAL REPORT
YEAR 1935

1. GENERAL

The year 1935 was one of increased production from lower level areas which had been developed, and in which mining had been started in 1934. This increase in production was reflected in better operating conditions and a consequent reduction in costs. Although much the larger share of production came from regular stoping operations, development was carried on which placed 62,250 tons of additional available ore in sight so that the net reduction in ore reserves for the year was 76,211 tons. It should be remembered that in developing 1 ton of ore at this property, only 1/2 ton is available for mining because of the necessity of leaving pillars of the semi-hard ore which support the large swamp overlaying the mine.

The most important disclosure during the year was the continuation of the thick, low phosphorus section at the northwest end of the ore body, downward on levels from the 8th to 9th. In this area a large tonnage of low phosphorus, medium sulphur ore is available which is suitable for mixing with the higher phosphorus ores in other sections of the lower levels. The phosphorus content of ore reserves this year was limited to .300 and this also effected a reduction in reserves which last year averaged .400. The fact that this wide section of ore at the northwest end dips to the west of the present boundary of the Mackinaw Lease at the 9th, or bottom level elevation, made necessary the start of negotiations which will permit the extension of present mining rights. The present fee owners, the C. & N. W. Ry. Co. and the D.M. & M. Land Co., are also the owners of these westerly adjoining forties so that favorable action upon the matter is expected early in 1936.

Although there is the considerable amount of low phosphorus ore available at the northwest end of the ore body on lower levels, the central and southeast portions are rapidly becoming depleted. There is the possibility of three or four additional stopes in the last named territory and before these are exhausted, it is believed necessary to have development of the next lower, or 10th level, underway. Accordingly, in order to maintain balanced production, plans have been made to start sinking the incline shaft at the beginning of 1936. The mine schedule which was six days and four nights per week (labor rotated) during most of 1935, will be increased to four days of three shifts each. This leaves two days or six shifts in each week available for shaft sinking. The incline shaft is the limiting factor in mine production so that the separation of working time will eliminate interference with regular hoisting operations.

GARDNER MACKINAW MINE
ANNUAL REPORT
YEAR 1935

1. GENERAL (Cont.)

The end of the year finds the mine in excellent physical shape to furnish the increased production as provided by the additional two mining shifts per week. With continued development, the mining plant, both surface and underground, is in shape for steady production over a number of years without major additions or alterations. Pumping charges have been decreasing for the past four years, the quantity dropping from an average of 327 gallons per minute in 1931 to 138 in 1935.

The remarkable safety record held by the mine was terminated June 14th after reaching a total time of five years and one month without a lost time accident. On that date two injuries occurred which were almost identical in cause and results. The remainder of the year witnessed another extended period free of accidents.

2. PRODUCTION
SHIPMENTS &
INVENTORIES

a. Production by Grades

| <u>Grade</u> | <u>1935</u> | <u>1934</u> | <u>Increase</u> |
|--------------|-------------|-------------|-----------------|
| Gardner Ore | 0 | 0 | 0 |
| Mackinaw Ore | 138,471 | 78,353 | 60,118 |
| Total | 138,471 | 78,353 | 60,118 |

The increased production was due to the increased working schedule and to the higher proportion of mining over development contracts.

b. Shipments

| <u>Grade of Ore</u> | <u>Pocket</u> <u>Tons</u> | <u>Stockpile</u> <u>Tons</u> | <u>Total</u> <u>Tons</u> | <u>Total</u> <u>Last Year</u> |
|---------------------|------------------------------|---------------------------------|-----------------------------|----------------------------------|
| Gardner | 0 | 0 | 0 | 30,502 |
| Mackinaw | 69,932 | 74,535 | 144,467 | 79,762 |
| Total | 69,932 | 74,535 | 144,467 | 110,264 |

Increase 1935

34,203

c. Stockpile Inventories

| <u>Grade of Ore</u> | <u>Dec. 31, 1935</u> | <u>Dec. 31, 1934</u> | <u>Decrease</u> |
|---------------------|----------------------|----------------------|-----------------|
| Gardner | 247 | 247 | 0 |
| Mackinaw | 32,903 | 38,899 | 5,996 |
| Total | 33,150 | 39,146 | 5,996 |

GARDNER MACKINAW MINE
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2. PRODUCTION
SHIPMENTS &
INVENTORIES

d. Division of Product by Levels

| | <u>1935</u> | <u>%</u> | <u>1934</u> | <u>%</u> |
|-----------|----------------|----------|---------------|----------|
| 6th Level | 15,737 | 11 | 745 | 1 |
| 7th Level | 19,993 | 14 | 26,082 | 33 |
| 8th Level | 51,611 | 38 | 25,030 | 32 |
| 9th Level | 51,130 | 37 | 26,496 | 34 |
| Total | <u>138,471</u> | 100 | <u>78,353</u> | 100 |

The product in 1934 was mainly from development of the 8th and 9th Levels and in 1935 from mining above these levels.

e. Production by Months

| | <u>Mackinaw Ore</u> <u>Tons</u> | <u>Rock</u> <u>Tons</u> |
|-----------|------------------------------------|----------------------------|
| January | 8,575 | |
| February | 8,882 | |
| March | 12,177 | 71 |
| April | 11,096 | 24 |
| May | 11,577 | 12 |
| June | 12,221 | |
| July | 12,893 | |
| August | 14,047 | |
| September | 11,860 | |
| October | 13,616 | |
| November | 10,572 | |
| December | 10,955 | |
| Total | <u>138,471</u> | <u>107</u> |

f. Ore Statement

| | <u>Gardner</u> | <u>Mackinaw</u> | <u>Total</u> | <u>Total</u> <u>Last Year</u> |
|-------------------------|----------------|-----------------|----------------|----------------------------------|
| On hand Jan.1,1935 | 247 | 38,899 | 39,146 | 71,057 |
| Product for year | 0 | 138,471 | 138,471 | 78,353 |
| Total | <u>247</u> | <u>177,370</u> | <u>177,617</u> | <u>118,661</u> |
| Shipments | 0 | 144,467 | 144,467 | 79,762 |
| Balance on hand | <u>247</u> | <u>32,903</u> | <u>33,150</u> | <u>38,899</u> |
| Increase in Output | | | 60,118 | |
| Decrease in ore on hand | | | 5,996 | |

1935 - 1-8 hr. shift four days per week, labor rotated, each man receiving 2 days per week Jan. 1 to Feb. 10.
1-8 hr. shift 6 days per week, labor rotated, each man receiving 3 days per week Feb. 11 to Dec. 31.

GARDNER MACKINAW MINE
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2. PRODUCTION
SHIPMENTS &
INVENTORIES (Cont.)

f. Ore Statement (cont.)

1934 - January 1 to February 19 - 4 crews sinking shaft and cutting 8th and 9th Level Plats. Mine 6 days and nights per week, men 3 days each per week on a rotated basis. February 19 to May 1st - mine operated single shift three days per week. Average number of men about 60. May 1st to Sept. 1st - mine operated single shift six days per week, labor rotated with three days per week each. Average total number of men about 110. Sept. 1 to December 31 - mine operated single shift 4 days per week, labor receiving 2 days per week. Average total number of men about 115.

g. Delays

There were no extended non-electrical delays during the year and it is interesting to note that the same tonnage was lost in 1935 as in 1934. The most serious delay occurred May 22nd when broken wires necessitated the immediate changing of the cage rope. The detail of delays follows:

| | | | | | | | | |
|---------|---|---------------------------------|-------|---|----------------------------|---|-----------------|----------|
| Jan. 4 | - | 3 Hr. | delay | - | Skip off track | - | loss in tonnage | 0 |
| May 22 | - | 4 " | " | - | Changing rope on cage | - | " | 125 |
| 24 | - | 4 " | " | - | Broken Trolley Wire | - | " | 100 |
| Oct. 29 | - | 3 ³ / ₄ " | " | - | Repair loose wheel on skip | - | " | 100 |
| Nov. 26 | - | 4 " | " | - | " | " | " | 100 |
| 27 | - | 1 ¹ / ₂ " | " | - | Repair top tram trestle | - | " | 100 |
| Total | | 23 ¹ / ₄ | hrs. | | | | | 425 tons |

h. Delays from Lack of Current

The single non-serious delay from power failure was January 17, three hour delay, no current underground hoist - loss in tonnage 0.

3. ANALYSIS

a. Average Mine Analysis on Output

| | | | | | |
|--------------|-------------|-------------|--------------|-------------|-------------|
| <u>Grade</u> | <u>Tons</u> | <u>Iron</u> | <u>Phos.</u> | <u>Sil.</u> | <u>Sul.</u> |
| Mackinaw | 138,471 | 61.09 | .214 | 2.94 | .850 |

These figures represent an increase in the iron content and a decrease in the phosphorus content as compared to 1934. The sulphur content increased, due to higher proportion of ore from stopes at the north-west end of the 6th and 7th Levels.

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3. ANALYSIS (Cont.)

b. Average Analysis on Straight Cargoes

| <u>Grade</u> | <u>Mine</u> | | | <u>Lake Erie</u> | |
|-----------------|-------------|--------------|-------------|------------------|---------------|
| | <u>Iron</u> | <u>Phos.</u> | <u>Sil.</u> | <u>Iron</u> | <u>Moist.</u> |
| <u>Mackinaw</u> | 60.84 | .188 | 3.02 | 61.20 | 10.88 |

The above represents only a small proportion of the shipments, most of the Mackinaw ore being mixed with other ores.

c. High Sulphur Ore

Additional development at the northwest end of the 6th and 7th Levels confirmed the belief that the larger portion of the reserves in this territory would analyze approximately 1.5% sulphur. Northwest end development of the 8th and 9th Levels lowered this content slightly to between 1 and 1.5%. The central portion of the ore body which analyzes approximately 0.5% is becoming depleted and it is mainly for this reason that preparations have been made to sink the incline shaft to the 10th Level in expectation of finding ore analyzing below 0.5% which will form a suitable mixture for the 6th and 7th Level ore.

d. High Phosphorus Ore

Development of the 8th and 9th Levels in 1934 disclosed greater lengths of high phosphorus ore than on any levels heretofore opened. Development at the northwest end in 1935 gave proof to the belief that this wide section of the ore body was of a lower average phosphorus content than the north central portion, which on the 9th Level returned an analysis in 1934 of .780 for a length in excess of 500'. This development increased ore reserves and allowed a decrease in the phosphorus content of the total reserve from .400 to .300. Stopes near the hanging wall at the northwest end above the 8th Level have consistently returned a low phosphorus analysis in the latter part of the year and it is hoped that the greater portion of this wide ore body may be stoped with the same results.

The theory has been advanced that at the lower level elevations the sulphur content of the ore is being replaced by phosphorus. With shaft sinking planned for 1936, it will be interesting to note whether this condition continues with depth and what proportion of the ore body is affected.

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ANNUAL REPORT
YEAR 1935

4. ESTIMATE
OF ORE
RESERVES

a. Developed Ore

Assumption: 12 cu. ft. equals one ton
10% deducted for rock
10% deducted for loss in mining
Estimate is of available ore only

| <u>Non-Bessemer</u> | <u>Tons</u> |
|--|---------------|
| 5th to 6th Level | 31,380 |
| 6th to 7th Level | 84,656 |
| 7th to 8th Level | 91,489 |
| 8th to 9th Level | 80,829 |
| Below 9th Level | <u>17,782</u> |
| Total available developed ore December 31, 1935 | 306,116 |

Statement showing ore reserves and new ore development for the following years:

| | <u>1931</u> | <u>1932</u> | <u>1933</u> | <u>1934</u> | <u>1935</u> |
|---------------------|----------------|---------------|----------------|----------------|----------------|
| Ore in Mine Jan.1st | 139,349 | 135,992 | 71,312 | 164,858 | 382,337 |
| Production | <u>79,439</u> | <u>24,769</u> | <u>3,405</u> | <u>78,353</u> | <u>138,471</u> |
| Balance | 59,910 | 111,223 | 67,907 | 86,505 | 243,866 |
| Ore in Mine Dec.31 | <u>135,992</u> | <u>71,312</u> | <u>164,858</u> | <u>382,337</u> | <u>306,116</u> |
| New Ore Developed | 76,082A | -39,911B | 96,951C | 295,832D | 62,250E |

- A. Increase due to ore proved up on and below the 7th Level.
- B. Decrease due to elimination of high sulphur ore areas.
- C. Increase due to sinking of incline shaft.
- D. Large increase due to development of 8th and 9th Levels.
- E. Increase due to northwest end development of 8th and 9th Levels.

c. Estimated Analysis

Ore Reserves: Approximate Expected Natural Analysis
Developed Ore

| | <u>Iron</u> | <u>Phos.</u> | <u>Sil.</u> | <u>Mang.</u> | <u>Alum.</u> | <u>Lime</u> | <u>Mag.</u> | <u>Sul.</u> | <u>Ign.</u> | <u>Moist.</u> |
|----------|-------------|--------------|-------------|--------------|--------------|-------------|-------------|-------------|-------------|---------------|
| Mackinaw | 52.90 | .300 | 3.10 | .22 | 1.64 | 1.88 | 1.20 | .900 | 2.45 | 12.50 |

Ore in Stock: Average Natural Analysis

| | <u>Iron</u> | <u>Phos.</u> | <u>Sil.</u> | <u>Mang.</u> | <u>Alum.</u> | <u>Lime</u> | <u>Mag.</u> | <u>Sul.</u> | <u>Ign.</u> | <u>Moist.</u> |
|----------|-------------|--------------|-------------|--------------|--------------|-------------|-------------|-------------|-------------|---------------|
| Gardner | 52.00 | .098 | 2.89 | .29 | 1.69 | 3.12 | 2.25 | .582 | 4.28 | 10.80 |
| Mackinaw | 54.32 | .161 | 2.87 | .22 | 1.67 | 1.92 | 1.10 | .800 | 2.50 | 10.59 |

There are two changes in the expected analysis of ore reserves. The Phosphorus is reduced from .400 to .300 and the sulphur increased from .800 to .900 in order to utilize a larger portion of the higher sulphur ore at the northwest end of the 6th and 7th Levels.

The higher iron content of the ore from lower levels is reflected by the increase over that reported last year for the ore in stock.

GARDNER MACKINAW MINE
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5. LABOR
AND
WAGES

a. Comments

1. Labor

There was an over-supply of all labor except good miners, throughout the year because of general unemployment in the district.

2. New Construction

There was no new construction in 1935.

b. Comparative Statement of Wages & Product

| | <u>1935</u> | <u>1934</u> | <u>Increase</u> | <u>Decrease</u> |
|-------------------------------------|--------------------|--------------------|-------------------|-----------------|
| <u>PRODUCT</u> | 138,471 | 78,353 | 60,118 | |
| Number Shifts & Hours | 1-8 hr. | 1-8 hr. | | |
| <u>AVERAGE NO. MEN WORKING</u> | | | | |
| Surface | 26 | 23 | 3 | |
| Underground | <u>97</u> | <u>80</u> | <u>17</u> | |
| Total | 123 | 103 | 20 | |
| <u>AVERAGE WAGES PER DAY</u> | | | | |
| Surface | 4.31 | 4.37 | | .06 |
| Underground | <u>4.70</u> | <u>4.66</u> | <u>.04</u> | |
| Total | 4.61 | 4.55 | .06 | |
| <u>AVERAGE WAGES PER MONTH</u> | | | | |
| Surface | (13 days) 56.03 | (10 days) 43.70 | (3 days) 12.33 | |
| Underground | <u>61.10</u> | <u>44.66</u> | <u>14.44</u> | |
| Total | 59.93 | 45.50 | 14.43 | |
| <u>PRODUCT PER MAN PER DAY</u> | | | | |
| Surface | 26.67 | 20.38 | 6.29 | |
| Underground | <u>7.80</u> | <u>6.64</u> | <u>1.16</u> | |
| Total | 6.04 | 5.01 | 1.03 | |
| <u>LABOR COST PER TON</u> | | | | |
| Surface | .162 | .208 | | .046 |
| Underground | <u>.603</u> | <u>.701</u> | <u>.098</u> | |
| Total | .765 | .909 | .144 | |
| <u>AVERAGE PRODUCT MINING</u> | | | | |
| Stoping | 101,271 | 34,918 | 66,353 | |
| Ore Development | <u>37,200</u> | <u>43,435</u> | <u>6,235</u> | 6,235 |
| Total | 138,471 | 78,353 | 60,118 | |
| <u>AVERAGE WAGES CONTRACT LABOR</u> | | | | |
| | 4.906 | 4.823 | .083 | |

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5. LABOR
AND
WAGES

b. Comparative Statements of Wages and Product (Cont.)

| | <u>1935</u> | <u>1934</u> | <u>Increase</u> | <u>Decrease</u> |
|--|----------------------|----------------------|---------------------|-----------------|
| <u>TOTAL NUMBER OF DAYS</u> | | | | |
| Surface | 5,191 $\frac{1}{2}$ | 3,844 $\frac{1}{2}$ | 1,347 | |
| Underground | 17,743 $\frac{3}{4}$ | 11,800 | 5,943 $\frac{3}{4}$ | |
| Total | 22,935 $\frac{1}{4}$ | 15,644 $\frac{1}{2}$ | 7,290 $\frac{3}{4}$ | |
| <u>AMOUNT FOR LABOR</u> | | | | |
| Surface | \$ 22,365.72 | 16,275.33 | 6,090.39 | |
| Underground | 83,457.97 | 54,929.97 | 28,528.00 | |
| Total | 105,823.69 | 71,205.30 | 34,618.39 | |
| <u>AVG. WAGES PER MONTH BASED ON MEN CARRIED ON MINE PAYROLL</u> | | | | |
| Surface | 56.03 | 43.70 | 12.33 | |
| Underground | 61.10 | 46.60 | 14.44 | |
| Total | 59.93 | 45.50 | 14.43 | |

Proportion of Surface to Underground Man

1935 - 1 to 3.42 - One 8 hr. shift - 2 Days per week Jan.1 to Feb.10, 1935
 3 " " Feb.11, to Dec.31, "

1934 - 1 to 3.48 - One 8 hr. shift - Sinking auxiliary shaft, etc. Jan.1 to Feb.18
 1934.
 2 days per week Feb.19 to Apr.15
 3 " " Apr.15 to Aug.31,
 2 " " Sept.1 to Dec.31

1933 - 1 to .90 - One 8 hr. shift - 2 days per week Jan.1 to Apr. 8, 1933
 3 " " Nov.10 to Dec.31
 Mine idle from April 8 to Nov. 10
 Re-opening mine bailing water Nov.10 to
 Nov. 24
 Sinking auxiliary shaft Nov.24 to Dec.31

1932 - 1 to 2.00 - One 8 hr. shift - 2 days per week Jan.1 to June 1, 1932
 2 " " Nov. 1 to Dec. 31
 Mine idle June 1 to Nov. 1

6. SURFACE

a. Buildings, Repairs

The cage sheave in the headframe was replaced early in March by a duplicate from the Athens Mine. The old sheave had formerly been in use at the Stephenson Mine and developed a cracked rim.

Repairs to the boiler plant and heating system were made in the fall in readiness for the winter months and new doors were installed at the Mackinaw tunnel entrance to prevent freezing in the shaft.

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6. SURFACE

b. Stockpiles

Three additional bents were erected at the Mackinaw stockpile ground in March to provide for the additional ore hoisted because of the increased working schedule. Shipments from pocket and stockpile started in May, and in August the steam shovel loading from stockpile made necessary the dismantling of the wooden trestle. All portions which could be salvaged were drawn out of the way, and used again in the fall. Notification to cease shipments was received October 28th so four bents were immediately erected and stocking started October 31st. Seventeen additional bents were erected in November to take care of the winter's stocking program.

7. UNDERGROUND

a. Shaft Sinking

There was no shaft sinking in 1935 but preparations were being made to start sinking the incline shaft early in January, 1936. This shaft had reached an incline depth of 48' below the 9th Level in January, 1934. The jasper footwall had entered the shaft at a depth of 11' below the 9th Level, due to a local roll or squeeze which is believed to be southerly pitching. If this theory is correct, the shaft or its southwest course, should re-enter the ore body and continue in ore for possibly one half the incline distance of 170' necessary to open the 10th Level 125' vertically below the 9th.

By means of the changed working schedule described under general remarks, it is planned to sink the shaft without the use of a pentice. The regular skip has been altered so that the back plate is easily removed for hand shovelling and is then replaceable for regular hoisting operations. There will be no interference of one operation with the other with the exception of the small amount of time necessary to remove from the hoist drum or replace the north skip rope, and lengthen or shorten the south, or sinking skip rope. No E&A has been prepared for this work, the cost of which will be carried on the monthly cost sheet under the heading of "Sinking".

b. Development

Development of the three lower levels was continued throughout the year. The larger proportion was raising, of which there was a total of 2660'. Practically all of this was preparatory to regular stopping operations, the detail of which appears later in the report. The total amount of drifting was 1755', most of which was in the northwest portion of the ore body on levels from the 6th to the 9th. As already noted, the disclosure of the downward continuation of

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7. UNDERGROUND (Cont.)

b. Development (Cont.)

this thick low phosphorus section of the ore body was the most important feature of the year.

Additional development to the north on the sub drift under the hanging wall above the 6th Level, was discontinued in ore whose sulphur analysis had increased to 3% before reaching the suspected fault zone at the end of the ore body. The advance here was 70'. It is planned to develop the ore to the south of the high sulphur area by means of a footwall drift at the 6th Level elevation early in 1936.

Two drifts were advanced in the great thickness of ore near the northwest end of the 7th Level. One of these, in the central portion, furnished a traveling road to the top of the stope raises put up from the 8th Level. The other was a drift near the footwall from which stope raises had started upward to the 6th Level in December. The footwall drift was partly in high phosphorus ore and had not reached the north contact at the end of the year. The total advance in these drifts was 385', all of which was in ore.

The No. 2 or northwest heading at the 8th Level elevation, had been stopped in high phosphorus ore in September, 1934. The extension of this drift was resumed in February, after completion of the similar 9th Level heading. During February, March and April, the drift was held to approximately a 9' x 9' cross-section in advancing a distance of 210' through the narrow high phosphorus section of the ore body. At the end of April low phosphorus ore was encountered and this persisted for the remainder of the 270' advance to the northwest in contact with the hanging wall. The hanging dipped at a very steep angle in the vicinity of #23 stope, 7th Level, and this carried downward forcing the 8th Level drift to the north so that it is only 50' west of the 7th Level although it is 125' below. A 55' cross cut and a 35' footwall turnout drift in this vicinity both disclosed the high phosphorus ore extending farther north nearer the footwall, and additional development is planned here in 1936. Upon completion of the northwest hanging wall drift in July, raise development was started and stoping in the low phosphorus ore subsequently disclosed, was well underway at the end of the year.

The No. 2 or northwest 9th Level development drift was completed early in February with an advance of 115'. The drift was north along the west boundary of the present lease and encountered the footwall close to the fault contact terminating the ore body on the north. This was evident from the inclusion of brecciated material in the breast of the drift and its nearness to the westerly projected line of the fault as located on the 7th and 8th Levels. The

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7. UNDERGROUND (Cont.)

b. Development (Cont.)

total advance of this drift northwest of the incline shaft amounted to 985' in a development period of exactly one year. A length of 200' of ore was disclosed east of the C. & N. W. forty boundary line and a double raise development to the 8th Level elevation proved the downward continuation of the low phosphorus ore in this territory.

c. Stoping

Stoping operations were confined to levels below the 5th. Development furnished the larger share of the product in 1934, and stoping operations the larger share in 1935. The product by levels shows 25% from the 6th and 7th, and 75% divided nearly equally between the 8th and 9th Levels. Ore from various sections in the mine was mixed daily to provide a balanced analysis throughout the year. The detail description of stoping operations follows:

6th Level

Southeast of Shaft

Considerable ore was produced from a timber breakdown in the vicinity of No. 8 chute. The drift caved in March for a distance of about 50' due to rotted timber and several months were necessary to effect complete repairs.

The chute opening at No. 3 stope was repaired in November and a small amount of ore drawn from the footwall of the stope.

Northwest of Shaft

No. 11 chute was repaired in December and approximately 700 tons of previously blasted ore drawn off. This stope will furnish some additional production of an excellent grade of ore early in 1936.

A new chute was constructed in August at the bottom of No. 14 stope. The old traveling road by way of No. 13 raise was cleaned and repaired in order to stope an additional 15' of ore along the south side of No. 14. The widening of the stope by this amount was done to utilize the low phosphorus ore made available on this side of the large pillar between Nos. 12 and 14 stopes when No. 13 raise was halted in jasper. Mining operations were started just

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7. UNDERGROUND (Cont.)

6th Level (Cont.)

Northwest of Shaft (Cont.)

below the 5th Level and carried downward instead of in the usual manner to insure safe working conditions. The mining of an additional 10' was completed late in October and the broken ore cleaned down to the chute in November.

Stoping operations started in the previously incompleted No. 18 stope in January. Mining under the hanging wall was carried to a point above the 5th Level floor elevation in February. Scraping of the ore on the footwall in this thick stope was continued for several months.

The development of the northwest end of the ore body at the sub level elevation was started in July. The driving of a 60' crosscut on the line of No. 22 raise was followed by the disclosure of the high sulphur ore to the north. Stopping operations started in September. An incline stope was advanced in an easterly direction along the south side of the high sulphur ore, the ore being scraped along the sub level drift to No. 22 stope. This stope reached an inclined height of 55' curving slightly to the south. A second stope was then started 60' north of No. 22 raise and connected to the first. The average width of the two stopes was about 18', leaving a 30' pillar between. A third stope was started in November from the back of the footwall crosscut on the line of No. 22 raise. This stope was extended from a point 25' northeast of the raise to a breast 65' distant. The stope width is 20' and at the end of the year mining had reached a height of 30' above the sub level floor. To improve ventilation, a sub level drift was driven 30' to the southeast to connect with the upper portion of No. 21 raise.

The old scraper slide that had been used in No. 2 heading, was repaired early in April and a new drift started to connect the top of the 7th level, No. 23 raise. The drift intersected the jasper contact at the northwest end of the ore body almost immediately and was curved to the west along this contact for a distance of 65' where it intersected the top of the raise.

7th Level

Southeast of Shaft

A small stope was started in December at the southeast end of the level drift. At the end of the year it had reached a height of 15' above the level floor without contacting the hanging wall. The stope length was 30'

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7. UNDERGROUND (Cont.)

7th Level (Cont.)

Southeast of Shaft (Cont)

southeast of No. 1 chute. The ore is scraped into cars at the old scraper slide which had been used in driving this drift.

No. 2 stope was advanced 30' to the 6th Level floor in August. The stope width was reduced 25' by jasper on the southeast side and the ore thickness to 15'. In September, the stope was completed at a height of 15' above the 6th Level floor or 180' above the 7th Level.

A timber breakdown occurred in September at No. 6 chute and considerable ore from the level drift and footwall of No. 6 stope was recovered as the level timbering was repaired.

No. 8 chute was repaired in December and a small additional amount of ore recovered from the footwall.

Northwest of Shaft

Stoping operations were conducted above the 7th Level floor in September and October by an extension of the 8th Level No. 14 stope. The breast of this lower stope was advanced until intersection was made with the floor of No. 15 stope above the 7th Level. The inclined distance above the 7th Level was 35' under the jasper hanging wall.

No. 23 stope was started in January by the driving of a 20' sub level drift and a 50' raise connection. Stopping operations were then started under the hanging wall, the ore passing through the open chute to the level drift, where it was scraped directly into cars. A 110' raise connection to the 6th Level was provided in April after which stoping was resumed and in July reached a total inclined height of 120'. The maximum stoping thickness was 35' and the width 33'. The low angle of the hanging wall and the high sulphur content necessitated temporary abandonment of this stope.

Preparations to develop the ore nearer the footwall were started in May. A 60' drift was driven in the high phosphorus-high sulphur ore, the first 40' being in contact with the footwall. In October the traveling road connection to the tops of the 8th Level raises was turned off and advanced through the central portion of the ore body. Connections to Nos. 22 and 23 raises were provided, after which the advance in the footwall drift was resumed. The ore encountered in the latter drift was mixed in character, some sections of high phosphorus and high sulphur ore being disclosed. The first of the raises

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7. UNDERGROUND (Cont.)

7th Level

Northwest of Shaft (Cont.)

planned for this drift started in December and at the end of the year the man-way raise had reached a height of 45' and No. 22 raise a height of 15'. Present plans for this territory call for theming of the ore near the hanging wall first by means of Nos. 22 and 23 stopes from the 8th Level. A later stope will necessitate the extension of a small drift along the footwall on the 8th Level in order to mine the lower portion of the ore body from the 8th to 6th Levels. Portions of these lower stopes will probably be in high phosphorus ore but it is believed a suitable mixture can be made without sacrificing much of the ore on the footwall.

8th Level

Southeast of Shaft

No. 6 stope was advanced 20' in a narrowing seam of ore. When the ore thickness decreased to less than 5', a raise connection was completed to the 7th Level elevation, or a total inclined height of 160'. This open raise and stope provided a ventilation circulation for the two lower levels. Operations will probably be resumed here early in 1936 by extending the sub level drift to the southeast in order to reach the downward extension of the 20' thickness of ore which had been mined in No. 3 stope on the 7th Level.

No. 7 raise was started in October and completed in November at the 7th Level elevation, the total inclined height being 155'. The stope was started early in December and at the end of the year had reached an inclined height of 70' in ore 12' thick. The stope width is 35'. No. 8 raise was completed at the 7th Level elevation in June. The stope was started in July and reached the 7th Level floor in September, the advance being 150' in ore 15' thick. The stope width was 30'. No. 9 stope had reached a height of 70' at the end of 1934. It was completed at the 7th Level floor in March at a total inclined height of 150' in ore which declined in thickness from 25' to 20'. The stope width was 30'.

Northwest of Shaft

No. 11 stope was 120' high at the end of 1934. It was completed at the 7th Level elevation in February at a total height of 160'. The stope width was 30' and the ore thickness also 30'.

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7. UNDERGROUND (Cont.)

8th Level

Northwest of Shaft (Cont.)

No. 12 stope was advanced from a height of 90' to completion at the 7th Level elevation in April, at a total height of 145'. The ore thickness declined from 45' to 37' and the stope width was carried at 26'.

No. 13 stope had reached a height of 95' at the end of 1934 in a maximum ore thickness of 55'. It was completed at the 7th Level elevation in April at a total height of 160'. The ore thickness in this stope also reduced to 20' at the 7th Level elevation, the stope width being carried at 25'. In May a stope was started on the line of the winze in order to include in mining operations the great thickness of ore developed in this section. The timber was first removed from the lower part of the winze and a chute was then constructed on the northwest side to deliver ore into cars on the 8th Level. From this point stoping was started which included the old winze and an additional distance of 10 to 12' to the northwest. The width of this stope and No. 14 to the northwest, was held to 25' to maintain a pillar of the same width between. The footwall contact had not been intersected in stoping to an inclined height of 85' so a small sub drift was driven to the northeast which disclosed an ore thickness, normal to the dip, of about 90'. On the northwest side of the stope, however, a sudden turn in the footwall reduced the ore thickness to about 60' at this elevation. In order to mine the ore on the footwall, a raise was put through to the northeast side of the 7th Level drift. The raise height was 85' and because of its proximity to the footwall, most of it was in high phosphorus ore. At the end of the year, the stope had reached an inclined height of 135', and because of the great thickness, it has been necessary to scrape most of the ore to a chute on the 8th Level.

The raise and sub level drift connections necessary to open No. 14 stope, were provided in March. No. 14 raise was connected to the 7th Level elevation at a total height of 170' in April. Stoping started in May, reached the 7th Level in August and as previously noted, was continued under the hanging wall to the floor of No. 15 stope above the 7th Level. The average ore thickness was 33' and the stope width 25'.

No. 15 raise was started in a narrow high phosphorus section of the ore body in July. It reached a total height of 50' in August in an extremely hard formation which averaged .600 in phosphorus. The sub level drift was extended 20' to the northwest in the same formation

240 240

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7. UNDERGROUND (Cont.)

8th Level

Northwest of Shaft (Cont.)

but operations were then suspended here in order to speed up development in the lower phosphorus ore at the northwest end of the 8th Level.

The development of No. 2 drift was completed in August and since that time three stopes have been started in this northwest low phosphorus section of the ore body.

No. 21 raise was started in November and connected to the 7th Level foot-wall drift in December at a total inclined height of 175'. Stopping had started under the hanging wall at the end of the year.

Traveling raise and sub level drift connections were first provided northwest of No. 22 raise, and in October the raise was completed at the 7th Level elevation at a total inclined height of 175'. Stopping was started under the hanging wall the same month and at the end of the year had reached a height of 110'. The stope thickness is being carried at 30' by scraping the ore to the chute in the hanging wall drift and the stope width is 30'.

No. 23 raise was also started in September, and advanced to the 7th Level elevation upon completion of traveling road connections. The total inclined height of the raise was 170'. Stopping then started and was carried to a height of 80' in a 30' thickness of ore under the hanging wall. This stope borders the northwest end of the ore body at this elevation. The width was increased to the northwest until the contact was reached. Stopping along this fault line was in progress at the end of the year, having reached the total height of 110'. Early in 1936 stopping will be in an easterly direction along the contact and this will reduce the stope width to former proportions.

Mining in these three stopes (21,22,23), has had an extremely beneficial effect on the analysis of the product. The phosphorus and sulphur have consistently been low and in the case of the former, has helped in reducing the analysis of the product below that of a year ago.

9th Level

Southeast of Shaft

No. 8 raise was started in April and advanced to the 8th Level elevation after completion of the sub level drift 20' to the northwest. The first 100' of this raise was in ore averaging approximately .100 in phosphorus while the remainder was in material averaging .900 phosphorus. Stopping

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7. UNDERGROUND (Cont.)

9th Level

Southeast of Shaft (Cont.)

started in August and was completed in November at a total inclined height of 165'. The ore thickness declined from 20' to 15' in this advance and the stoping width was maintained at 30'.

No. 9 stope was at a height of 55' at the beginning of the year. It was completed at the 8th Level elevation at a total height of 150'. The ore thickness here also reduced from 35' to 27'. The ore was drawn from the footwall of the stope as late as July.

Northwest of Shaft

No. 11 raise was connected to the upper sub level drift in January with an advance of 50'. In July it was completed at the 8th Level elevation at a total height of 180', and in December stoping operations were started and at the end of the year the stope had reached a height of 30' in high phosphorus ore 15' thick.

No. 12 stope had reached a height of 95' at the end of 1934. It was advanced to the upper sub level elevation in February, after which the raise was connected to the 8th Level at an additional height of 40'. The low inclination of the footwall made necessary the scraping of all the ore from the upper portion of this stope. The maximum thickness was 45'. Mining operations were completed in June, and the scraping of the ore from the footwall continued for an additional several months.

No. 13 stope had been advanced in 1934 to an inclined height of 75' under the ^{weak} hanging wall. Early in 1935 the lower portion of the stope was supported with stulls and cribbing on the south side of the lower sub level drift. This blocked the chute but put an end to the slabbing of the weak jasper and slate hanging wall seams. During the remainder of the advance in this stope, the ore was scraped to a chute constructed at the bottom of the ventilation raise and in June the stope was completed at the 8th Level at a total height of 185'. The maximum thickness of ore in the upper portion of the stope was 35' and the analysis of ore from this stope and No. 12 was the exceptional quality, averaging nearly 64.00 Iron, .080 Phos. and .590 sulphur.

No. 14 stope was 70' high at the end of 1934 and this stope also gave trouble because of the slabbing of the weak hanging wall. At a height of 70' a protective seam of ore was left in the back and the remainder of the advance completed without dilution of the ore.

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7. UNDERGROUND (Cont.)

9th Level

Northwest of Shaft (Cont.)

The stope reached the 8th Level elevation in May, the total height being 180' in ore approximately 23' thick. The stope width was 30'.

No. 15 raise was started in March, after completion of a 50' traveling raise and 20' sub level drift. The raise was completed at the 8th Level elevation in June, the total advance being 175'. A stope was started the same month and reached completion in September. Most of the ore from this stope was high in phosphorus, the maximum thickness being 25' and the stope width 30'.

No. 16 raise was started in August and a 30' sub level connection driven to the southeast. The raise reached the 8th Level elevation in October and the stope was completed in December at a total inclined height of 160'. The phosphorus analysis in this stope at times was in excess of 1% and the thin upper portion was abandoned in this material.

Mining operations were suspended at the northwest end of the 9th Level after completing the drift at the fault contact in February. It was not until September that operations were resumed here by stripping the east side of the drift for a length of 70' near the northwest end so that track could be laid and ballasted. Chutes were constructed on the lines of #24 and #25 and a 50' traveling raise and sub level connection driven.

#24 raise reached the 8th Level elevation in November, the total advance being 180'. With the exception of the last 50', the average phos. content was in excess of .500 and this was due to the hanging wall contact which cut the raise at a low angle during the whole of this advance. A ten foot connection at the 8th Level elevation completed work here and the raise will be maintained as a ventilation connection to exhaust air from the 9th Level workings.

#25 raise was also completed at the 8th Level in November at a total height of 165'. A 25' drift connection was provided to the northeast side of the 8th Level drift and stoping operations in the ore which averaged 62.00 Iron, .100 Phos. and .900 Sulphur, were started early in December. The stope had reached an inclined height of 75' at the end of the year in ore 25' thick under the hanging wall. The Phosphorus content was somewhat higher than that of the raise because of the inclusion of seams of graphitic slate within the ore nearer the hanging wall.

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7. UNDERGROUND (Cont.)

d. Timbering

The total cost of timber and the cost per ton declined from that of the year previous because of the smaller amount of development.

Statement of Timber Used

| | <u>Lineal</u> <u>Feet</u> | <u>Amount</u> <u>1935</u> | <u>Amount</u> <u>1934</u> |
|---|------------------------------|------------------------------|------------------------------|
| 8" to 10" Timber | 486 | 31.28 | 41.63 |
| 10" to 12" " | 1,568 | 95.34 | 126.35 |
| 12" to 14" " | 3,765 | 210.76 | 238.08 |
| Total Timber | 5,819 | 337.38 | 406.06 |
| 5' Lagging | 31,725 | 176.25 | 254.00 |
| 9' - 6" Poles | 48,221 $\frac{1}{2}$ | 589.96 | 524.81 |
| Total Lagging & Poles | 79,946 $\frac{1}{2}$ | 766.21 | 778.81 |
| Product | | 138,471 | 78,353 |
| Feet of Timber per ton of ore | | .0042745 | .0075032 |
| Feet of lagging per ton of ore | | .0229111 | .0562840 |
| Feet of lagging per foot of timber | | 5.4519670 | 1.0924120 |
| Feet of poles per ton of ore | | .3482730 | .0061330 |
| Cost per ton for timber | | .0024380 | .0051820 |
| Cost per ton for lagging | | .0012720 | .0032170 |
| Cost per ton for Poles | | .0042600 | .0066980 |
| Total cost per ton - All timber | | .0079700 | .0211970 |
| Equivalent of stull timber to board measure | | 20.9443000 | 21.1603000 |
| Feet of Board Measure per ton of ore | | | .0027000 |
| Total cost for timber, lagging & Poles | | \$1,103.59 | \$ 1,184.87 |

| <u>Year</u> | <u>Amount</u> | <u>Cost per ton</u> |
|-------------|---------------|---------------------|
| 1935 | \$1,103.59 | .0080 |
| 1934 | 1,184.87 | .0212 |
| 1933 | 174.68 | .0513 |
| 1932 | 238.81 | .0097 |
| 1931 | 876.67 | .0110 |
| 1930 | 2,300.66 | .0184 |
| 1929 | 1,722.04 | .0147 |

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7. UNDERGROUND (Cont.)

e. Drifting and Raising

The comparative table showing the divisions of the large amount of development work done during the past two years follows:

| | <u>Drifting</u> | | | <u>Raising</u> | | | <u>Combined Total</u> |
|------|-----------------|-------------|--------------|----------------|-------------|--------------|-----------------------|
| | <u>Ore</u> | <u>Rock</u> | <u>Total</u> | <u>Ore</u> | <u>Rock</u> | <u>Total</u> | |
| 1934 | 2,105 | 65 | 2,170 | 2,108 | 0 | 2,108 | 4,278 |
| 1935 | 1,730 | 25 | 1,755 | 2,660 | 0 | 2,660 | 4,415 |

As mentioned before, the large amount of raising was preparatory to regular stoping operations. Each stope requires a pilot raise which is then used as a traveling and ventilation outlet. The very small proportion of rock work in each year is notable.

f. Explosives, Drilling and Blasting

| <u>Statement of Explosives Used</u> | <u>Quantity</u> | <u>Average Price</u> | <u>Amount 1935</u> | <u>Amount 1934</u> |
|--------------------------------------|-----------------|----------------------|--------------------|--------------------|
| 50% Gelatine Special | 93,612½ | .1202 | 11,253.36 | 759.38 |
| 60% Gelex A | 4,750 | .1271 | 593.75 | 7,148.00 |
| Total Powder | 98,362½ | .1204 | 11,847.11 | 7,907.38 |
| Fuse | 197,375 | .5656 | 1,116.30 | 1,079.99 |
| Caps | 30,260 | 1.1217 | 339.43 | 282.04 |
| Connecting Wire | 18 | .4000 | 7.20 | |
| Tamping Bags | 3,500 | .2180 | 7.63 | 22.45 |
| Fuse Igniters | 2,600 | .8100 | 23.40 | 13.52 |
| Total Fuse, etc. | | | 1,493.96 | 1,398.00 |
| Total All Explosives | | | 13,341.07 | 9,305.38 |
| Average price per hundred for Powder | | | .1204 | .1188 |
| Product | | | 138,471 | 78,353 |
| Pounds of Powder per ton of ore | | | .7104 | .9572 |
| Tons of ore per pound of powder | | | 1.4078 | 1.0447 |
| Cost per ton - Powder | | | .0855 | .1009 |
| Cost per ton - Fuse, Caps, etc. | | | .0108 | .0179 |
| Cost per ton - All Explosives | | | .0963 | .1188 |

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7. UNDERGROUND

f. Explosives, Drilling & Blasting (Cont.)

| | | |
|--------|--------------------------------|-----|
| 95.1% | of all powder used in 1935 was | 50% |
| 4.9% | " " " " 1935 " | 60% |
| 11.2% | " " " " 1934 " | 50% |
| 88.8% | " " " " 1934 " | 60% |
| 100.0% | " " " " 1933 " | 60% |
| 26.5% | " " " " 1932 " | 40% |
| 4.3% | " " " " 1932 " | 45% |
| 56.5% | " " " " 1932 " | 50% |
| 12.7% | " " " " 1932 " | 60% |
| 97.8% | " " " " 1931 " | 50% |

The following statement shows the cost per ton for explosives for the past five years, exclusive of rock development:

| <u>Year</u> | <u>Cost per Ton</u> | <u>Product</u> |
|-------------|---------------------|----------------|
| 1935 | .0963 | 138,471 |
| 1934 | .1188 | 78,353 |
| 1933 | .1688 | 3,405 |
| 1932 | .0841 | 24,769 |
| 1931 | .1959 | 79,439 |

i. Ventilation

The natural ventilaton system functioned perfectly throughout the year . Approximately 7,000 cu. ft. per minute entered the workings by way of the Mackinaw shaft, of which 3,000 reached the 9th Level. At a depth of nearly 1500' below surface, the temperature would be prohibitive of proper working conditions were it not for the controlled natural ventilating system.

j. Faults

The brecciated fault contact marking the northwest limit of the ore body on the 6th Level, was reached on the 7th Level in 1934, and on the 8th and 9th Levels in 1935. The greatest known thickness of ore in the Mackinaw vein is adjacent to this fault, reaching a distance of 140' horizontally across the vein at the 7th Level. Two drifts which penetrated the fault during 1934 are later described under the heading of "Explorations".

k. Pumping

The average number of gallons pumped per minute for the past seven years is as follows:

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7. UNDERGROUND

k. Pumping (Cont.)

| <u>Month</u> | <u>1935</u> | <u>1934</u> | <u>1933</u> | <u>1932</u> | <u>1931</u> | <u>1930</u> | <u>1929</u> |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| January | 143 | 174 | 210 | 241 | 463 | 100 | 116 |
| February | 142 | 169 | 205 | 223 | 419 | 101 | 113 |
| March | 138 | 170 | 205 | 236 | 470 | 100 | 111 |
| April | 138 | 166 | 203 | 244 | 327 | 126 | 115 |
| May | 140 | 158 | 181 | 231 | 332 | 102 | 101 |
| June | 140 | 156 | 184 | 223 | 314 | 114 | 104 |
| July | 137 | 147 | 181 | 225 | 302 | 104 | 109 |
| August | 134 | 155 | 180 | 222 | 273 | 111 | 106 |
| September | 135 | 149 | 172 | 218 | 192 | 128 | 109 |
| October | 135 | 143 | 189 | 218 | 263 | 180 | 99 |
| November | 134 | 149 | 224 | 215 | 260 | 236 | 99 |
| December | 133 | 146 | 221 | 211 | 253 | 350 | 99 |
| Total average | 138 | 157 | 196 | 225 | 327 | 142 | 107 |

The sealing underground in 1931 and 1932 of the diamond drill holes from surface, has resulted in a steady decrease in the amount of water pumped during the last four years.

8. COST OF OPERATING

a. Comparative Mining Costs

| | <u>1935</u> | <u>1934</u> | <u>Increase</u> | <u>Decrease</u> |
|--------------------------|-------------|-------------|-----------------|-----------------|
| <u>Product - Tons</u> | 138,471 | 78,353 | 60,118 | |
| Undergound Costs | .951 | 1.158 | | .207 |
| Surface Costs | .198 | .233 | | .035 |
| General Mine Accounts | .163 | .250 | | .087 |
| Cost of Production | 1.312 | 1.641 | | .329 |
| Depreciation-Plant Acct. | .065 | .333 | | .268 |
| " Develop. " | .065 | .451 | | .386 |
| Taxes | .024 | .042 | | .018 |
| Cost on Stockpile | 1.466 | 2.467 | | 1.001 |
| Loading and Shipping | .078 | .113 | | .035 |
| Re-opening Mine | | .057 | | .057 |
| Total cost on cars | 1.544 | 2.637 | | 1.093 |
| Number of days operating | 293 | 218 | 75 | |
| No. of shifts and hours | 1-8 hr. | 1-8 hr. | | |
| Average daily product | 473 | 359 | 114 | |

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8. COST OF OPERATING

a. Comparative Mining Costs (Cont.)

| <u>Cost of Production</u> | <u>1935</u> | <u>1934</u> | <u>Increase</u> | <u>Decrease</u> |
|---------------------------|-------------|-------------|-----------------|-----------------|
| Labor | .809 | .990 | | .181 |
| Supplies | .735 | 1.647 | | .912 |
| Total | 1.544 | 2.637 | | 1.093 |

b. Detailed Cost Comparison

| | <u>1935</u> | <u>1934</u> | <u>Increase</u> | <u>Decrease</u> |
|--------------------------------|-------------|-------------|-----------------|-----------------|
| Days per week | 2 and 3 | 2 and 3 | | |
| Shifts & Hours | 1-8 | 1-8 | | |
| Production, Tons | 138,471 | 78,353 | 60,118 | |
| Average Daily production, tons | 473 | 359 | 114 | |
| Number of Days worked | 293 | 218 | 75 | |

| <u>Underground Costs</u> | <u>Amount</u> | <u>Per Ton</u> | <u>Amount</u> | <u>Per Ton</u> | <u>Amount</u> | <u>Per Ton</u> | <u>Amount</u> | <u>Per Ton</u> |
|--------------------------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|
| 1. Exploring in Mine | 67.92 | .000 | 101.26 | .001 | | | 33.34 | .001 |
| 2. Sinking in Shaft | 834.63 | .006 | | | 834.63 | .006 | | |
| 4. Development in Ore | 22,604.78 | .162 | 27,052.10 | .345 | | | 4,447.32 | .183 |
| 5. Stopping | 57,168.15 | .413 | 26,997.12 | .344 | 30,171.03 | .069 | | |
| 6. Timbering | 7,280.73 | .053 | 5,437.74 | .069 | 1,842.99 | | | .016 |
| 7. Trimming | 19,961.44 | .144 | 12,522.30 | .160 | 7,439.14 | | | .016 |
| 9. Pumping | 9,412.55 | .068 | 7,819.03 | .099 | 1,593.52 | | | .031 |
| 10. Compressors & Air Pipes | 2,466.98 | .018 | 1,933.40 | .025 | 533.58 | | | .007 |
| 11. Reopening Expense | | | 4,510.66 | .057 | | | 4,510.66 | .057 |
| 12. Underground Supts. | 5,101.90 | .037 | 3,962.27 | .051 | 1,139.63 | | | .014 |
| 14. Compressors & Power Drills | 963.74 | .007 | | | 963.74 | .007 | | |
| 15. Scrapers | 1,593.93 | .012 | 530.10 | .007 | 1,063.83 | .005 | | |
| 16. Electric Tram Equipt. | 3,471.13 | .025 | 3,741.19 | .049 | | | 270.06 | .024 |
| 17. Pumping Machinery | 714.52 | .005 | 605.91 | .008 | 108.61 | | | .003 |
| Total Undg. Costs | 131,642.40 | .950 | 95,213.08 | 1.215 | 36,429.32 | | | .265 |

Surface Costs

| | | | | | | | | |
|------------------------------|-----------|------|-----------|------|----------|------|--------|------|
| 18. Hoisting | 14,678.18 | .107 | 10,144.85 | .129 | 4,534.32 | | | .022 |
| 19. Stocking Ore | 3,033.91 | .022 | 1,943.42 | .025 | 1,090.49 | | | .003 |
| 21. Dry House | 3,030.61 | .022 | 2,286.05 | .029 | 744.56 | | | .007 |
| 22. General Surface Expense | 861.53 | .006 | 519.35 | .006 | 342.18 | | | |
| 23. Hoisting Equipment | 4,163.47 | .030 | 2,053.95 | .026 | 2,109.52 | .004 | | |
| 24. Shaft | 342.52 | .002 | 252.05 | .003 | 90.47 | | | .001 |
| 25. Top Tram Equipment | 620.07 | .004 | 153.48 | .002 | 466.59 | .002 | | |
| 26. Docks, Trestles, Pockets | 412.44 | .003 | 642.62 | .008 | | | 230.18 | .005 |
| 27. Mine Buildings | 235.87 | .002 | 278.49 | .005 | | | 42.62 | .003 |
| Total Surface Costs | 27,379.60 | .198 | 18,274.27 | .233 | 9,105.33 | | | .035 |

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8. COST OF OPERATING

B. Detailed Cost Comparison (Cont)

| | <u>1935</u> | | <u>1934</u> | | <u>Increase</u> | | <u>Decrease</u> | |
|------------------------------|-------------------|----------------|-------------------|----------------|------------------|----------------|-----------------|----------------|
| | <u>Amount</u> | <u>Per Ton</u> | <u>Amount</u> | <u>Per Ton</u> | <u>Amount</u> | <u>Per Ton</u> | <u>Amount</u> | <u>Per Ton</u> |
| 28. Insurance | 483.03 | .003 | 575.82 | .007 | | | 92.79 | .004 |
| 29. Mining Engineering | 1,011.00 | .007 | 1,009.39 | .013 | 1.61 | . | | .006 |
| 30. Mechanical & Elec. Engr. | 176.70 | .001 | 184.90 | .002 | | | 8.20 | .001 |
| 31. Analysis & Grading | 3,253.63 | .024 | 1,766.20 | .023 | 1,487.43 | .001 | | |
| 32. Personal Injury | 2,657.96 | .019 | 1,918.87 | .024 | 739.09 | | | .005 |
| 33. Safety Department | 269.32 | .002 | 285.90 | .004 | | | 16.58 | .002 |
| 34. Telephones & Safety Dev. | 326.00 | .003 | 233.84 | .003 | 92.16 | .000 | | |
| 35. Local & General Welfare | 1,692.00 | .012 | 1,190.86 | .015 | 501.14 | | | .003 |
| 36. Special Exp..Pensions | 2,732.00 | .020 | 2,820.76 | .036 | | | 88.76 | .006 |
| 37. Ishpeming Office | 5,278.00 | .038 | 5,065.08 | .065 | 212.92 | | | .027 |
| 38. Saranac Invest. Exp. | 756.86 | .006 | 1,323.24 | .017 | | | 566.38 | .011 |
| 39. Mine Office | 3,631.20 | .026 | 3,209.06 | .041 | 422.14 | | | .015 |
| Total General Mine Exp. | 22,267.70 | .161 | 19,583.92 | .250 | 2,683.78 | | | .089 |
| COST OF PRODUCTION | 181,289.70 | 1.309 | 133,071.27 | 1.698 | 48,218.43 | | | .389 |
| 40. Taxes | 3,271.88 | .024 | 3,255.27 | .042 | 16.61 | | | .018 |
| Total Cost | 184,561.58 | 1.333 | 136,326.54 | 1.740 | 48,235.04 | | | .407 |
| Less Supply Inventories | 23.55 | .000 | 21.22 | .000 | 2.33 | | | |
| GRAND TOTAL COST | 184,538.03 | 1.333 | 136,305.32 | 1.740 | 48,232.71 | | | .407 |

1. Exploring in Mine
Proportion of Geological Department.
2. Sinking in Shaft
Preliminary charges preparatory to sinking the auxiliary shaft another lift or for the 10th Level.
3. Development in Rock
There was practically no rock development in 1935
4. Development in Ore
Less development of ore was done in 1935 compared with 1934.
5. Stoping
There was extensive stoping during 1934; 101,271 tons compared with 34,918 for 1934.
6. Timbering
More timbering of Raises, Drifts, etc. was done during 1935.
7. Tramming
Tramming 138,471 tons during 1935 as compared with 78,353 in 1934.

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8. COST OF OPERATING

b. Detailed Cost Comparison (Cont.)

9. Pumping

72,964,993 gallons of water were pumped during 1935 and the cost increased accordingly.

10. Compressors & Air Pipes

More extensions to air lines underground.

11. Reopening Expense

No expense for this item during 1935.

12. Underground Superintendence

More time worked by shift bosses during 1935 than 1934.

14. Compressors & Power Drills

Re-built drilling machines from Spies-Virgil Mine charged out during 1935.

15. Scrapers

More repairs to Scrapers and electric loaders made in 1935.

16. Electric Tram Equipment

Less repairs to this equipment during 1935.

17. Pumping Machinery

Less repairs to electric pumps.

18. Hoisting

More electric current consumed account of increased hoist.

19. Stocking Ore

More ore stocked during 1935; 69,034 tons compared with 48,559 tons stocked during 1934.

21. Dry House Expense

More fuel used and mine operating more time during 1935 which required more time by dry men.

22. General Surface Expense

More time spent improving mine premises, etc.

23. Hoisting Equipment

Extensive repairs to hoisting equipment made during 1935.

24. Shaft

General repairs to Mackinaw shaft, both main and auxiliary.

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8. COST OF OPERATING

b. Detailed Cost Comparison

25. Top Tram Equipment

More repairs to this equipment during 1935.

26. Docks, trestles & pockets

Less repairs to trestles during 1935.

27. Mine Buildings

Less general repairs to mine buildings in 1935.

28. Insurance

Distributive charge.

29. Mining Engineering

Practically the same charge for 1935 and 1934.

30. Mechanical & Electrical Engineering

Distributive charge.

31. Analysis and Grading

Increase due to larger hoist and more determinations made from the different raises, drifts, stopes, etc.

32. Personal Injury

Increased charge due to accidents in 1935.

33. Safety Department

Less Safety Department expense during 1935.

34. Telephones & Safety Devices

More extensions to underground lighting system.

35. Local and General Welfare

36. Special Expense - Pensions

37. Ishpeming Office

38. Sarana Investigation Expense

Distributive charges from the Ishpeming Office.

39. Mine Office

Increase due to more overhead charges from General Storehouse and increased traveling expense during 1935.

40. Taxes

Although there was an increase in valuation of \$20,000 for the Gardner Mackinaw over the 1934 valuation on account of the increase in ore reserves, the taxes paid were practically the same. This was due to a decrease in the tax rate, in 1935.

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8. COST OF OPERATING

b. Detailed Cost Comparison (Cont.)

Comparative Supply Balance

| | <u>Jan. 1st</u> <u>1936</u> | <u>Jan. 1st</u> <u>1935</u> | <u>Increase</u> | <u>Decrease</u> |
|-----------------------|--------------------------------|--------------------------------|-----------------|-----------------|
| 1. General Supplies | 1,216.11 | 1,620.28 | | 404.17 |
| 2. Iron and Steel | 154.37 | 161.60 | | 7.23 |
| 3. Oil and Grease | 62.76 | 43.48 | 19.28 | |
| 4. Machinery Supplies | 2,782.57 | 2,470.36 | 312.21 | |
| 5. Explosives | 56.00 | 120.00 | | 64.00 |
| 6. Lumber & Timber | 1,366.59 | 1,036.62 | 329.97 | |
| 7. Fuel | 1,279.15 | 1,170.00 | 109.15 | |
| Total | 6,917.55 | 6,622.34 | 295.21 | |

Comparison of Supplies Used & Cost per Ton

| | <u>1935</u> | | <u>1934</u> | | <u>Increase</u> | | <u>Decrease</u> | |
|--------------------------|---------------|----------------|---------------|----------------|-----------------|----------------|-----------------|----------------|
| | <u>Amount</u> | <u>Per Ton</u> | <u>Amount</u> | <u>Per Ton</u> | <u>Amount</u> | <u>Per Ton</u> | <u>Amount</u> | <u>Per Ton</u> |
| 1. General Supplies | 3,705.18 | .027 | 4,253.28 | .054 | | | 548.10 | .027 |
| 2. Iron & Steel | 1,384.29 | .010 | 1,565.25 | .020 | | | 180.96 | .010 |
| 3. Oil & Grease | 838.64 | .006 | 700.24 | .009 | 138.40 | | | .003 |
| 4. Machinery Supplies | 5,781.32 | .042 | 2,837.81 | .036 | 2,943.51 | .006 | | |
| 5. Explosives | 13,279.47 | .096 | 9,305.38 | .119 | 3,974.09 | | | .023 |
| 6. Lumber & Timber | 2,597.93 | .019 | 2,495.42 | .032 | 102.51 | | | .013 |
| 7. Fuel | 1,747.17 | .013 | 1,193.75 | .015 | 553.42 | | | .002 |
| 8. Electric Power | 27,100.30 | .196 | 19,771.09 | .253 | 7,329.21 | | | .057 |
| 9. Sundries | 1,705.10 | .012 | 951.41 | .012 | 753.69 | | | |
| 10. Other Mines & Accts. | 345.36 | .003 | 454.56 | .006 | | | 109.20 | .003 |
| Total | 57,794.04 | .418 | 42,619.07 | .544 | 15,174.97 | | | .126 |

9. EXPLORATIONS
AND FUTURE
EXPLORATIONS

The north fault was penetrated in February by a drift from the top of #24 stope above the 7th Level. The small drift was driven 15' to the north, and the fault zone was found to be of the same thickness. The displacement appears to have been to the east on the south side and to the west on the north side. A steeply dipping cherty jasper formation revealed to the north, so in order to reach a relatively more westerly section of the formation, a second exploratory drift was extended from the north end of the 7th Level hanging wall drift, but this too disclosed the cherty jasper formation. There remains the possibility however, of ore formation to the south and west of this fault zone at lower level elevations, and future exploratory work by means of diamond drill may be advisable.

Exploration and development of lower horizons by means of the incline shaft and 10th level drifts will be under way in 1936.

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10. TAXES

| | <u>1935</u> | | <u>1934</u> | |
|--|------------------|--------------|------------------|--------------|
| | <u>Valuation</u> | <u>Taxes</u> | <u>Valuation</u> | <u>Taxes</u> |
| <u>GARDNER MINE, C. & N. W. LEASE</u> | | | | |
| SE $\frac{1}{4}$ of SE $\frac{1}{4}$ of Sec. 35, 45-25.... | \$ 5,000 | 92.57 | 5,000 | 110.30 |
| NW $\frac{1}{4}$ of NE $\frac{1}{4}$ of Sec. 2, 44-25.... | 80 | 1.48 | 80 | 1.76 |
| Personal Property..... | 95,000 | 1,757.75 | 100,000 | 2,206.00 |
| Total..... | \$ 100,080 | 1,851.80 | 105,080 | 2,318.06 |
| Collection Fees..... | | 18.52 | | 23.18 |
| Total Taxes..... | | \$ 1,870.32 | | 2,341.24 |
| <u>MACKINAW MINE, D. M. & M. LEASE</u> | | | | |
| N $\frac{1}{2}$ of SE $\frac{1}{4}$ & SW $\frac{1}{4}$ of SE $\frac{1}{4}$ of Sec. 35, 45025..... | \$ 75,000 | 1,387.68 | 50,000 | 1,103.00 |
| Collection Fee..... | | 13.88 | | % 11.03 |
| Total Taxes..... | | \$ 1,401.56 | | 1,114.03 |

11. ACCIDENTS
AND
PERSONAL
INJURY

In 1934 the Gardner Mackinaw stood at the head of the list of Company mines in its accident record. The record was extended to June 14th, or a total of 1851 days without a lost time accident. On that date, two accidents occurred which are described below. The remainder of the year witnessed another period free of accidents and it is hoped that it may be as extensive as the last period.

Accident Report #68, occurred on June 14, 1935 in No. 14 stope on the 8th Level, back seven to ten feet from the floor of the stope. The Captain and shift boss inspected this place at 9:30 A.M. and told the miners to trim the back and make it safe. The miners claimed they trimmed the back but when they finished and started to work under it, a piece of ore fell. The injured man had jumped to the side but the piece struck him on the ankle. His partner said they had sounded the back and thought it was safe. The man suffered a compound comminuted fracture of the right fibula. He returned to work on December 20, 1935 operating the underground hoist.

Accident Report #69, occurred on June 14, 1935 in No. 12 stope, 9th Level, back about 6 $\frac{1}{2}$ feet high. The miner was running the scraper hoist and went into the stope to change the block. A piece of ore fell hitting him on the side and pushing him over. His right leg was caught under it, breaking the leg above the ankle. His partner said that they tried to take it down in the morning but it would not release. The chunk of ore was only 6 $\frac{1}{2}$ feet above the floor of the stope. He suffered a simple fracture of left tibia and fibula. Bruises of right thigh and bruises of chest. He returned to work as powderman on Dec. 5, 1935.

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12. NEW CONSTRUCTION
AND
PROPOSED NEW
CONSTRUCTION

There was no new construction during 1935, and that planned for 1936 is in connection with sinking the incline shaft, such as construction of a new skip pit, pump house, shaft plat and pocket at the 10th Level elevation. The cost of this work will appear under the heading of shaft sinking.

13. EQUIPMENT
AND
PROPOSED
EQUIPMENT

a. Steam Shovels

Necessary repairs to the steam shovels were made in the spring before the opening of the shipping season.

b. Stockpile Grestles

Top landing planking was repaired and three additional bents were erected in the spring to provide for the increased product. In the fall 21 bents were erected for stocking the winter's product.

c. Pumping Equipment

The three lowest levels, i.e., the 7th, 8th and 9th, are now equipped with air pumps, which can be operated only when the compressor works. Early in 1936 an electric pump will be added on the 9th Level which will lift the water direct to the 5th Level. The air pumps will be repaired and left in place in case of accident to the new electric pump installation.

d. Haulage Equipment

One electric six ton trolley locomotive and nine rocker dump cars were received from the Spies Virgil Mine in the fall. This equipment is being completely repaired and will be available for use in 1936 on the new 10th Level.

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15. POWER

Electric Power was furnished by the Cliffs Power & Light Company at varying rates throughout the year. On December 16, 1935, credit was rendered for Sales Tax charged on power during the period from May 1, 1934 to May 31, 1935, in the amount of \$980.31.

The detail of power used in 1935 and 1934 follows:

| | <u>KWH USED</u> | | <u>Increase</u> | <u>Decrease</u> | <u>Remarks</u> |
|------------------------|-----------------|--------------|-----------------|-----------------|----------------|
| | <u>1935</u> | <u>Y1934</u> | | | |
| Gardner Hoist | 0 | 0 | | | Idle |
| Mack. Hoist & Lighting | 303,429 | 182,914 | 120,515 | | Mine opt. |
| Compressors | 1,002,137 | 659,850 | 342,287 | | more ex- |
| Electric Haulage | 101,200 | 73,300 | 27,900 | | tensively |
| Shops | 2,752 | 2,122 | 630 | | " |
| Top Tram-Mackinaw | 1,248 | 632 | 616 | | " |
| Underground Hoist | 109,220 | 66,680 | 42,540 | | " |
| Pumping & Lighting | 329,496 | 286,999 | 42,497 | | " |
| Analysis (Crusher) | 129 | 85 | 44 | | " |
| " (Drier) | 11,313 | 4,032 | 7,281 | | " |
| Flood Lights-Mackinaw | 2,175 | 1,015 | 1,160 | | " |
| Heating Plant | 1,932 | 1,485 | 447 | | " |
| Dry House | 4,508 | 3,460 | 1,048 | | " |
| Office | 644 | 485 | 159 | | " |
| Timbering | 1,942 | 1,000 | 942 | | " |
| Total | 1,872,125 | 1,284,059 | 588,066 | | |
| In Cash | \$ 27,100.30 | 20,933.22 | 6,167.08 | | |
| Cost per KWH | .0145 | .0163 | | | |

17. CONDITION
OF
PREMISES

Improvements in the appearance of the grounds near the mine buildings were made during the summer. Small trees, flowers, and shrubbery were planted adjacent to the general office and captain's office. The parking area was extended, dressed with cinders and a new fence erected. The general improvement was well worth the small cost of labor which was applied on house rent arrears.

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18. NATIONALITY
OF
EMPLOYEES

| <u>As to Parentage</u> | <u>1935</u> | <u>%</u> | <u>1934</u> | <u>%</u> |
|------------------------|-------------|----------|-------------|----------|
| English | 11 | 8.2 | 9 | 6.1 |
| Finnish | 45 | 34.1 | 42 | 32.3 |
| Italian | 32 | 24.1 | 32 | 24.6 |
| Swedish | 20 | 15.1 | 20 | 15.4 |
| French-Canadian | 15 | 11.3 | 19 | 14.6 |
| Germans | 1 | .8 | 3 | 2.3 |
| Norwegians | 5 | 4.0 | 4 | 3.1 |
| Irish | 1 | .8 | 0 | 0 |
| Belgian | 1 | .8 | 1 | .8 |
| Hungarian | 1 | .8 | 1 | .8 |
| Total | 132 | 100.0% | 130 | 100.0% |

| <u>As to Birth</u> | <u>Total</u> | | <u>American Born</u> | | <u>Foreign Born</u> | |
|--------------------|--------------|-------------|----------------------|-------------|---------------------|-------------|
| | <u>1935</u> | <u>1934</u> | <u>1935</u> | <u>1934</u> | <u>1935</u> | <u>1934</u> |
| English | 11 | 8 | 7 | 4 | 4 | 4 |
| Finnish | 45 | 42 | 16 | 12 | 29 | 30 |
| Italian | 32 | 32 | 12 | 7 | 20 | 25 |
| Swedish | 20 | 20 | 7 | 12 | 13 | 8 |
| French-Canadian | 15 | 19 | 10 | 14 | 5 | 5 |
| Germans | 1 | 3 | 1 | 3 | 0 | 0 |
| Norwegians | 5 | 4 | 3 | 2 | 2 | 2 |
| Irish | 1 | 0 | 1 | 0 | 0 | 0 |
| Hungarian | 1 | 1 | 0 | 0 | 1 | 1 |
| Belgian | 1 | 1 | 0 | 0 | 1 | 1 |
| Total | 132 | 130 | 57 | 54 | 75 | 76 |

| | | | | |
|-------------|-----|-----|-----|-----|
| Percentages | 43% | 41% | 57% | 59% |
|-------------|-----|-----|-----|-----|

STEPHENSON MINE
ANNUAL REPORT
YEAR 1935

1. GENERAL

This mine was abandoned in 1927 but the Company is still paying the taxes on the original description, the $S\frac{1}{2}$ of the $SW\frac{1}{4}$ of Section 20,45-25, as well as the adjoining 80 acres to the south, i.e., the $N\frac{1}{2}$ of the $NW\frac{1}{4}$ of Section 29,45-25, on account of the ore in stock. The latter description is owned by the Chicago & North Western Railway Company.

Considerable steel was salvaged from the head frame blasted down in 1934. The remaining scrap material from the head frame was sold during the summer.

A small tonnage was shipped from stockpile, whereas no ore was shipped in 1934 (see 2.b)

2. PRODUCTION
SHIPMENTS &
INVENTORIES

b. Shipments

| <u>Grade</u> | <u>1935</u> | <u>1934</u> |
|--------------|-------------|-------------|
| Stephenson | 0 | 0 |
| Stephenwood | 14,458 | 0 |
| Northdale | 0 | 0 |
| Northwood | 0 | 0 |
| Total | 14,458 | 0 |

c. Stockpile Inventories

| | <u>1935</u> | <u>1934</u> |
|--|--------------|--------------|
| Stephenson Lease | | |
| $S\frac{1}{2}$ of $SW\frac{1}{4}$ of Sec. 20,45-25 | 101,097 | 115,555 |
| $N\frac{1}{2}$ of $NW\frac{1}{4}$ of " 29,45-25 | 18,976 | 18,976 |
| Grand Total | 120,073 tons | 134,531 tons |

| <u>Ore Statement</u> | <u>Stephen- son</u> | <u>Stephen- wood</u> | <u>North- dale</u> | <u>North- wood</u> | <u>Total</u> |
|-----------------------|-------------------------|--------------------------|------------------------|------------------------|--------------|
| On Hand Dec. 31, 1934 | 3,647 | 111,908 | 227 | 18,749 | 134,531 |
| Total Dec. 31, 1935 | 3,647 | 97,450 | 227 | 18,749 | 120,073 |

3. ANALYSISb. Average Analysis on Straight Cargoes

| <u>Grade</u> | <u>Tons</u> | <u>Mine</u> | | | <u>Lake Erie</u> | |
|--------------|-------------|-------------|--------------|-------------|------------------|-----------------|
| | | <u>Iron</u> | <u>Phos.</u> | <u>Sil.</u> | <u>Iron</u> | <u>Moisture</u> |
| Stephenwood | 14,458 | 60.33 | .753 | 3.71 | No analysis | |

8. COST OF OPERATINGa. Comparative Mining Costs

| | <u>1935</u> | <u>1934</u> | <u>Increase</u> | <u>Decrease</u> | <u>Cost per ton 1935</u> |
|---------------------------|-------------|-------------|-----------------|-----------------|--------------------------|
| Underground Costs | 0 | 0 | | | |
| Surface Costs | 1,096.88 | 865.32 | 231.56 | | |
| General Mine Expense | 81.72 | 16.26 | 65.46 | | |
| Total | 1,178.60 | 881.58 | | | |
| Loading & Shipping | 805.76 | 7.52 | 798.24 | | .055 |
| Taxes | 2,654.76 | 3,165.19 | | 510.43 | |
| Track Agreement E.L.S.Ry. | 0 | 0 | | | |
| Total Cost | 4,639.12 | 4,054.29 | 584.83 | | |

The increase in surface costs due to extra cost for police.

The increase in general mine expense was due to shipments in 1935. There were no shipments in 1934.

The assessed valuations were the same for 1935 and 1934.

With the same valuation, the taxes for 1935 showed a reduction of \$510.43 over 1934, due to a lower rate.

10. TAXES

| | <u>1935</u> | | <u>1934</u> | |
|---|------------------|--------------|------------------|--------------|
| | <u>Valuation</u> | <u>Taxes</u> | <u>Valuation</u> | <u>Taxes</u> |
| 80 acres - S $\frac{1}{2}$ of SW $\frac{1}{4}$, Sec. 20445-25..... | 1,000 | 18.50 | 1,000 | 22.06 |
| 80 acres, N $\frac{1}{2}$ of NW $\frac{1}{4}$, Sec. 29-45-25..... | 160 | 2.97 | 160 | 3.54 |
| Personal property, ore in stock | 140,000 | 2,590.36 | 140,000 | 3,088.40 |
| " " in warehse. | 900 | 16.65 | 900 | 19.85 |
| Total..... | 142,060 | 2,628.48 | 142,060 | 3,133.85 |
| Collection Fees..... | | 26.28 | | 31.34 |
| Total Taxes..... | | 2,654.76 | 142,060 | 3,165.19 |
| Rate per \$100.00 | | 1.860 | | 2.206 |

PRINCETON MINE
ANNUAL REPORT
YEAR 1935

1. GENERAL

This mine has been idle since 1921.

During the year, 101 tons of Cambridge Ore were loaded by hand and shipped to the Ricketson Color Works, Milwaukee, Wis.

The wooden headframe at No. 2 shaft was blasted down on July 11. This was badly rotted and was unfit for further use. Some of the timber was salvaged, the rest removed.

2. PRODUCTION
SHIPMENTS &
INVENTORIES

| b. <u>Shipments</u> | <u>1935</u> | <u>1934</u> | <u>Increase</u> | <u>Decrease</u> |
|---------------------------------|--------------|--------------|-----------------|-----------------|
| Cambridge | 101 | 134 | | 33 |
| c. <u>Stockpile Inventories</u> | | | | |
| | <u>1935</u> | <u>1934</u> | | |
| Cambridge | 106,364 | 106,454 | | |
| Princeport | 9,160 | 9,160 | | |
| Sec. 19 Cambridge | 13,815 | 13,826 | | |
| " 19 Princeport | <u>1,513</u> | <u>1,513</u> | | |
| Total | 150,652 | 150,753 | | |

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.
Percentage of Bessemer equals 0.

| | <u>Prince-</u> <u>port</u> | <u>Cambridge</u> | <u>Sec. 19</u> <u>Princeport</u> | <u>Sec. 19</u> <u>Cambridge</u> | <u>Total</u> |
|---------------------|-------------------------------|------------------|-------------------------------------|------------------------------------|--------------|
| Ore above 2nd Level | 2,552 | | | | 2,552 |
| Ore above 4th Level | | 78,325 | | | 78,325 |
| Ore above 5th Level | 20,000 | 58,778 | | | 78,778 |
| Ore above 6th Level | 60,318 | 445,694 | 9,000 | 57,128 | 572,140 |
| Total | 82,870 | 524,797 | 9,000 | 57,128 | 731,795 |

4. ESTIMATE
OF ORE
RESERVES

| | Prince- port | Cambridge | Sec.19 Princeport | Sec. 19 Cambridge | Total |
|---------------------------|-----------------|-----------|----------------------|----------------------|-----------|
| b. <u>Prospective Ore</u> | | | | | |
| Ore below 6th Level | 20,000 | 418,815 | 5,000 | 46,921 | 490,736 |
| Total Ore | | | | | 1,222,531 |

c. Estimated Analysis

| Grade | Iron | Phos. | Sil. | Mang. | Alum. | Lime | Mag. | Sul. | Ign. | Moist. |
|-------------------|-------|-------|------|-------|-------|-------|-------|------|-------|--------|
| <u>Princeport</u> | | | | | | | | | | |
| Dried 212° | 59.50 | .300 | 7.73 | .505 | 1.214 | 1.605 | 1.037 | .023 | 2.235 | |
| Natural | 50.60 | .256 | 6.57 | .429 | 1.032 | 1.365 | .882 | .020 | 1.900 | 15.00 |
| <u>Cambridge</u> | | | | | | | | | | |
| Dried 212° | 59.75 | .853 | 4.42 | 1.193 | .937 | 3.676 | .840 | .023 | 1.447 | |
| Natural | 50.80 | .725 | 3.76 | 1.014 | .797 | 3.125 | .714 | .020 | 1.230 | 15.00 |

d. Estimated Tonnage as required by State Tax Commission
Non-Bessemer Ore

| | | | |
|-------------|-----------------|-------------|----------------|
| Developed | 1. Princeport | 91,870 tons | |
| | 2. Cambridge | 639,925 " | |
| | Total Developed | | 731,795 tons |
| Prospective | 1. Princeport | 25,000 tons | |
| | 2. Cambridge | 465,736 " | |
| | | | 490,736 " |
| Grand Total | | | 1,222,531 tons |

The above estimates of ore in the mine were made in December, 1921.

8. COST OF
OPERATING

a. Comparative Costs

| | 1935 | 1934 | Increase | Decrease |
|------------------------------|----------|----------|----------|----------|
| Underground Costs | 0 | 62.16 | | 62.16 |
| Surface Costs | 1,542.61 | 869.52 | 673.09 | |
| General Mine Expense | 36.18 | 21.95 | 14.23 | |
| Total | 1,578.79 | 953.63 | | |
| Loading & Shipping | 57.72 | 65.91 | | 8.19 |
| Taxes | 4,424.21 | 5,254.67 | | 830.46 |
| C. & N.W. charges for tracks | 11.30 | | 11.30 | |
| Total | 6,072.02 | 6,274.21 | | 202.19 |

8. COST OF OPERATING

a. Comparative Costs

Underground Cost. The cost for 1934 was filling and fencing at the collar of No. 1 shaft, where timber had settled on account of rotting shaft timbers.

Surface Costs. During 1935 the cost under this caption increased \$673.09. Included in this item is \$221.76, which is not a cash expenditure but performed by men owing rent which they could not pay. The rest of the increased expense was from dismantling headframe and more cost for police protection.

General Mine Expense. The small increase in this account is due to increased cost allocated by Ishpeming Office for Personal Injury Expense and Analysis and Sampling.

Loading and Shipping. This cost decreased somewhat in that there was a little more ore shipped in 1934 than in 1935. Included in the above cost for 1935 is an item of \$23.12, which is not a cash expenditure but for labor performed by men owing rent, as explained under "Surface Costs".

Taxes. The decrease in taxes is from the fact that the tax rate decreased from \$2.206 in 1934 to \$1.850 in 1935. The 1935 valuation was slightly higher.

10. TAXES

| <u>Description</u> | <u>1935</u> | | <u>1934</u> | |
|---|------------------|--------------|------------------|--------------|
| | <u>Valuation</u> | <u>Taxes</u> | <u>Valuation</u> | <u>Taxes</u> |
| NE $\frac{1}{4}$ of NE $\frac{1}{4}$ of Sec.19,45-25 (C&NW) | 10,000 | 185.01 | 10,000 | 220.60 |
| 158.27 acres in Sec.18,45-25 | 10,000 | 185.01 | 10,000 | 220.60 |
| 160.00 acres in NW $\frac{1}{4}$ Sec.20,45-25 | 100,000 | 1,850.24 | 100,000 | 2,206.00 |
| NW $\frac{1}{4}$ of NE $\frac{1}{4}$, Sec.19,45-25 (Loc.) | 420 | 7.69 | 420 | 9.27 |
| S $\frac{1}{2}$ of NE $\frac{1}{4}$ of Sec.19,45-25 " | 840 | 15.38 | 420 | 9.27 |
| Personal Property | 115,000 | 2,127.80 | 115,000 | 2,536.90 |
| Total | 236,260 | 4,371.33 | 235,840 | 5,202.64 |
| Collection Fees | | 43.71 | | 52.03 |
| Total Taxes | | 4,415.04 | | 5,254.67 |
| Tax rate per \$100.00 | | 1.860 | | 2.206 |

The Forsyth Township tax levy in 1935 was 10% less than in 1934. This explains the rate decrease.

FRANCIS MINE
ANNUAL REPORT
YEAR 1935

1. GENERAL

This mine was abandoned in 1924. The steel headframe is the only structure remaining on the property. The ore remaining in stock is on an adjoining forty, the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 28,45-25.

2. PRODUCTION
SHIPMENTS &
INVENTORIES

| b. <u>Shipments</u> | <u>1935</u> | <u>1934</u> | <u>Increase</u> |
|---------------------------------|-------------|-------------|-----------------|
| Franport | 44,917 | 13,883 | 31,034 |
| c. <u>Stockpile Inventories</u> | <u>1935</u> | <u>1934</u> | |
| Franport | 109,679 | 154,596 | |

The difference in tonnage is due to seasons shipments.

3. ANALYSIS

b. Complete Analysis of Ore Shipped (Dried at 212° F.)

| <u>Franport</u> <u>Grade</u> | <u>Tons</u> | <u>Iron</u> | <u>Phos.</u> | <u>Sil.</u> | <u>Ma.</u> | <u>Al.</u> | <u>Lime</u> | <u>Mg.</u> | <u>Sul.</u> | <u>Loss</u> |
|---------------------------------|-------------|-------------|--------------|-------------|------------|------------|-------------|------------|-------------|-------------|
| Mine Analysis | 44,917 | 58.25 | .126 | 6.63 | .58 | 4.50 | .97 | 1.30 | .060 | 2.08 |
| Lake Erie | 44,917 | 58.10 | .118 | 6.76 | .58 | 4.60 | .90 | 1.40 | .055 | 2.10 |

4. COST OF
OPERATING

| | <u>1935</u> | <u>1934</u> | <u>Increase</u> | <u>Decrease</u> |
|----------------------|-------------|-------------|-----------------|-----------------|
| General Mine Expense | 293.24 | 128.65 | 164.59 | |
| Loading & Shipping | 2,373.03 | 666.63 | 1,706.40 | |
| Taxes | 2,535.73 | 2,135.46 | | 599.73 |
| Total Cost at Mine | 5,202.00 | 3,930.74 | 1,271.26 | |

The cost per ton for loading and shipping in 1935 was \$.053 as compared with \$.048 for 1934.

FRANCIS MINE
ANNUAL REPORT
YEAR 1935

10. TAXES

| | <u>1935</u> | | <u>1934</u> | |
|--|------------------|--------------|------------------|--------------|
| | <u>Valuation</u> | <u>Taxes</u> | <u>Valuation</u> | <u>Taxes</u> |
| SW $\frac{1}{4}$ of NW $\frac{1}{4}$ of Sec.27,45-25 | - | 3.56 | | 5.03 |
| SW $\frac{1}{4}$ of " 27, " | 500 | 9.25 | 500 | 11.03 |
| Personal Property | 135,000 | 2,497.85 | 140,000 | 3,088.40 |
| Total | 135,600 | 2,510.66 | 140,500 | 3,104.46 |
| Collection Fees | | 25.07 | | 31.00 |
| Total Taxes | | 2,525.73 | | 3,135.46 |
| Tax rate per \$100 | | 1.86 | | 2.206 |

The reduction in the amount paid in taxes in 1935 is due to lower valuation and lower tax rate.

GWINN DISTRICT GENERAL
ANNUAL REPORT
YEAR 1935

1. GENERAL

Conditions in the district were considerably better than a year ago. The Gardner Mackinaw Mine operated throughout the year, the men receiving approximately four days per week. As the schedule was on a staggered basis, the number of men employed was more than on a normal schedule. The extra time allowance here was granted to help compensate the men for the bus fare to and from the mine. The Employees Committee had been approached by the men to ask the Company to provide transportation.

A number of Gwinn district men received work at the Ishpeming and Negaunee mines.

State and Federal projects employed a number of men; those not obtaining work were given direct relief. The County sponsored a wood cutting project which granted all registrants the opportunity of securing wood without cost to themselves, delivered at their homes. The only requirement being that they were obliged to cut one cord for the County for every two they cut for themselves. The County wood was delivered to indigents.

There were a number of timber jobbing operations in the district, some of which were quite extensive and employed a considerable number of men. In addition, there were also many small operations getting out pulpwood.

C.C.C. Camp #1620, located 18 miles west of Gwinn, is still in operation. The town is full of CCC boys at the week ends as Gwinn is the nearest town to this camp.

Deposits in the Gwinn State Savings Bank December 31, 1935, showed an increase of \$24,000 over a year ago, whereas 1934 showed an increase of \$15,000 over 1933. The deposits now are only \$5,000 less than they were on December 31, 1931.

The Gwinn School continued on full time schedule throughout the year. the enrollment on December 31st was 629, or an increase of 8 over 1934.

During the 1933-1934 school year salary reductions averaging 30% were made affecting the whole teaching staff. In the fall of 1934 a 10% increase was made and another in the fall of 1935, so that at the present time, the salaries are 10% below normal.

The County Road Commission completed its stone garage early in the year, and it is now being used as the Road Commission headquarters in this district. It is located on Flint Street, just to the west of the Town hall. It is a good looking structure.

GWINN DISTRICT GENERAL
ANNUAL REPORT
YEAR 1935

1. GENERAL (Cont.)

A new brick and cinder block garage is being erected on Pine Street just north of the Bank. This building has a 75' front and will add to the appearance of this street.

The Horrigan Oil Company has built a filling station, also one on the east side of Pine Street, in the business section of the town. It is a very neat structure and located in the pine trees, makes it rather attractive.

a. Statement Showing Total Ore Produced in District by C.C.I.Co. 1903 to 1935 inclusive.

| <u>Year</u> | <u>Austin</u> | <u>Princeton</u> | <u>Stephenson</u> | <u>Gwinn</u> | <u>Francis</u> | <u>Gardner Mackinaw</u> | <u>Total</u> |
|---------------|---------------|------------------|-------------------|--------------|----------------|-------------------------|--------------|
| Total to 1935 | 1,582,616 | 1,584,353 | 3,798,890 | 988,665 | 522,602 | 720,303 | 9,197,479 |
| 1935 | 0 | 0 | 0 | 0 | 0 | 138,471 | 138,471 |
| | 1,582,616 | 1,584,353 | 3,798,890 | 988,665 | 522,602 | 858,774 | 9,335,950 |

b. Statement Showing Total Ore Shipments by C.C.I.Co. from 1905 to 1935 Inclusive

| <u>Year</u> | <u>Austin</u> | <u>Princeton</u> | <u>Stephenson</u> | <u>Gwinn</u> | <u>Francis</u> | <u>Gardner Mackinaw</u> | <u>Total</u> |
|---------------|---------------|------------------|-------------------|--------------|----------------|-------------------------|--------------|
| Total to 1935 | 1,589,018 | 1,453,580 | 3,693,986 | 988,325 | 350,071 | 703,898 | 8,778,878 |
| 1935 | | 101 | 14,458 | | 44,917 | 144,467 | 203,943 |
| | 1,589,018 | 1,453,681 | 3,708,444 | 988,325 | 394,988 | 848,365 | 8,982,821 |

c. Ore in Stock at Mines Dec.31,1935

| <u>Princeton</u> | <u>Stephenson</u> | <u>Francis</u> | <u>Gardner Mackinaw</u> | <u>Total</u> |
|------------------|-------------------|----------------|-------------------------|--------------|
| 130,652 | 120,073 | 109,679 | 33,150 | 393,554 |

5. LABOR AND WAGES

The number of shifts worked by employees in the district in 1935 was 22,935½ as compared with 18,969½ in 1934.

There was no change in the wage schedule in 1935.

GWINN DISTRICT GENERAL
ANNUAL REPORT
YEAR 1935

10. TAXES

The following statement gives the taxes in detail for 1935 and 1934 from all company properties in the district. The mine taxes, in the summary, show totals only, as the detail for each mine is included in the mine report.

The summary also includes the taxes paid by The Cliffs Power & Light Company in order to show the total taxes paid in Forsyth Township by the Company, exclusive of that paid by the Land Department.

| <u>Forsyth Township</u> <u>Mineral Lands, Gwinn Fee</u> | <u>1935</u> | | <u>1934</u> | |
|---|------------------|--------------|------------------|--------------|
| | <u>Valuation</u> | <u>Taxes</u> | <u>Valuation</u> | <u>Taxes</u> |
| SW $\frac{1}{4}$ of SW $\frac{1}{4}$, Sec.26,45-25, 45 acres | 80 | 1.48 | 80 | 1.76 |
| S $\frac{1}{2}$ of SE $\frac{1}{4}$, " 27, " 80 " | 160 | 2.97 | 160 | 3.54 |
| NW $\frac{1}{4}$ of SE $\frac{1}{4}$, " 27, " 40 " | 80 | 1.48 | 80 | 1.76 |
| NE $\frac{1}{4}$ of SE $\frac{1}{4}$, " 28, " 40 " | 80 | 1.48 | 80 | 1.76 |
| N $\frac{1}{2}$ of NE $\frac{1}{4}$, " 34, " 80 " | 160 | 2.97 | 160 | 3.54 |
| SE $\frac{1}{4}$ of NE $\frac{1}{4}$, " 34, " 40 " | 80 | 1.48 | 80 | 1.76 |
| NE $\frac{1}{4}$ of NW $\frac{1}{4}$ of " 34, " 40 " | 80 | 1.48 | 80 | 1.76 |
| NE $\frac{1}{4}$ of SE $\frac{1}{4}$ of " 34, " 40 " | 80 | 1.48 | 80 | 1.76 |
| NW $\frac{1}{4}$ of " 35, " 160 " | 320 | 5.92 | 320 | 7.06 |
| Lots 1,2,& 3," 36, " 52 " | 100 | 1.83 | 100 | 2.19 |
| Lots 7,8,& 9," 36, " 98.92" | 200 | 3.69 | 200 | 4.40 |
| Lot 11 " 36, " 13.3 " | 20 | .37 | 20 | .43 |
| S $\frac{1}{2}$ of N $\frac{1}{2}$ " 22, " 160 " | 500 | 9.24 | 500 | 11.04 |
| S $\frac{1}{2}$ of NE $\frac{1}{4}$ " 28, " 80 " | 130 | 2.40 | 130 | 2.87 |
| N $\frac{1}{2}$ of NW $\frac{1}{4}$ " 22,45-26, 87.08" | 90 | 1.66 | 90 | 1.99 |
| NE $\frac{1}{4}$ of " 2,45-26,165.61" | 190 | 3.51 | 190 | 4.19 |
| Total | 2,350 | 43.44 | 2,350 | 51.81 |
| Collection Fees | | .43 | | .52 |
| TOTAL | | 43.87 | | 52.33 |

Gwinn Townsite, Surface Only

| | | | | |
|--|--------|----------|--------|----------|
| NE $\frac{1}{4}$ of SW $\frac{1}{4}$,Sec,21,45-25,Not included in Plat 6-A..... | 100 | 1.86 | 100 | 2.21 |
| NE $\frac{1}{4}$ of SW $\frac{1}{4}$,Sec.21,45-25, 27.4 acres | 150 | 2.78 | 150 | 3.32 |
| That part of S $\frac{1}{2}$ of NW $\frac{1}{4}$ Sec.21,45-25 not included in Plat of Gwinn,25.01 A. | 200 | 3.70 | 200 | 4.41 |
| E $\frac{1}{2}$ of SE $\frac{1}{4}$ Sec.21,45-25, 65.84 acres | 140 | 2.60 | 140 | 3.08 |
| That part of W $\frac{1}{2}$ of SE $\frac{1}{4}$ Sec.21,45-25 not included in Plat of Gwinn,38.80 A. | 300 | 5.55 | 300 | 6.62 |
| Gwinn Townsite Plate..... | 89,255 | 1,650.76 | 90,005 | 1,987.52 |
| Part of W $\frac{1}{2}$ of SE $\frac{1}{4}$ Sec.21,45-25,Supts. residence 1/2 acres..... | 3,000 | 55.49 | 3,000 | 66.18 |
| NW $\frac{1}{4}$ of NE $\frac{1}{4}$ Sec.21,45-25,except 5 A. in cemetery, 35 acres..... | 100 | 1.86 | 100 | 2.21 |
| Part of S $\frac{1}{2}$ of NE $\frac{1}{4}$,Sec.21,45-25,50.88 A. | 300 | 5.55 | 300 | 6.62 |
| Total..... | 93,545 | 1,730.15 | 94,295 | 2,082.17 |
| Collection Fees..... | | 17.30 | | 20.82 |
| TOTAL | | 1,747.45 | | 2,102.99 |

GWINN DISTRICT GENERAL
ANNUAL REPORT
YEAR 1935

10. TAXES (Cont.)

| | <u>1935</u> | | <u>1934</u> | |
|--|------------------|--------------|------------------|--------------|
| | <u>Valuation</u> | <u>Taxes</u> | <u>Valuation</u> | <u>Taxes</u> |
| <u>Gardner Mackinaw Dwellings</u> | | | | |
| N $\frac{1}{2}$ of NE $\frac{1}{4}$ Sec.35,45-25, 87.35 acres | 5,000 | 92.57 | 5,000 | 110.30 |
| Collection fee..... | | .93 | | 1.10 |
| Total Taxes..... | | 93.50 | | 111.40 |
| Personal District Office.... | 500 | 9.34 | 500 | 11.14 |
| N $\frac{1}{2}$ of NW $\frac{1}{4}$,Sec.27,45-25,Dist.Crusher | 1,000 | 18.68 | 1,000 | 22.28 |
| | | 28.02 | | 33.42 |
| <u>Austin Location</u> | | | | |
| Part of Lot 5 SW of NE,Sec.20,45-25 | 3,500 | 64.75 | 3,500 | 77.21 |
| NW $\frac{1}{4}$ of SE $\frac{1}{4}$ of Sec.20,45-25..... | 5,000 | 92.57 | 5,000 | 110.30 |
| NE $\frac{1}{4}$ of SW $\frac{1}{4}$,Sec.20,45-25 BH | 260 | 4.82 | 260 | 5.74 |
| Total..... | 8,760 | 162.14 | 8,760 | 193.25 |
| Collection Fees..... | | 1.62 | | 1.93 |
| Total..... | | 163.76 | | 195.18 |
| <u>Summary</u> | | | | |
| Stephenson Mine..... | 142,060 | 2,628.48 | 142,060 | 3,133.85 |
| Princeton Mine..... | 236,260 | 4,371.33 | 235,840 | 5,202.64 |
| Francis Mine..... | 135,500 | 2,510.66 | 140,500 | 3,104.46 |
| Gardner Mackinaw Mine..... | 175,080 | 3,239.48 | 155,080 | 3,421.05 |
| Mineral Lands..... | 2,350 | 43.44 | 2,350 | 51.81 |
| Gwinn Townsite..... | 93,545 | 1,730.15 | 94,295 | 2,082.17 |
| Austin Location..... | 8,760 | 162.14 | 8,760 | 193.25 |
| Gardner Mackinaw Location..... | 5,000 | 92.57 | 5,000 | 110.30 |
| Gwinn District Office..... | 500 | 9.34 | 500 | 11.14 |
| Gwinn District Crusher..... | 1,000 | 18.68 | 1,000 | 22.28 |
| Total C.C.I.Co..... | 800,055 | 14,806.27 | 785,385 | 17,332.96 |
| Collection Fees..... | | 148.06 | | 173.33 |
| Total Taxes | 800,055 | 14,954.33 | 785,385 | 17,506.29 |
| Cliffs Power & Light Co..... | 98,191 | 1,835.14 | 98,215 | 2,188.41 |
| GRAND TOTAL..... | 898,246 | 16,789.47 | 883,600 | 19,694.70 |
| Rate per \$100.00..... | | 1.860 | | 2.206 |

GWINN DISTRICT GENERAL
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YEAR 1935

10. TAXES (Cont.)

Taxes Levied - Forsyth Township

| | <u>1935</u> | <u>1934</u> | <u>1933</u> | <u>1932</u> |
|----------------------------|-------------|-------------|-------------|-------------|
| Forsyth Township Valuation | 1,478,229 | 1,469,033 | | |
| Rate per \$100.00 | 1.860 | 2.206 | | |
| <u>Amount of tax roll:</u> | | | | |
| State Tax..... | 7.61 | 852.48 | 853.97 | 5,449.87 |
| County Tax..... | 10,130.05 | 9,136.94 | 8,673.33 | 11,957.01 |
| " Debt Service..... | 548.03 | 800.00 | 1,965.39 | - |
| " Road..... | 1,114.30 | 734.52 | 735.85 | - |
| Township Tax..... | 4,368.58 | 4,700.91 | 3,296.16 | 4,500.00 |
| " Debt Service..... | 818.23 | - | 1,023.32 | - |
| School..... | 6,684.35 | 6,610.64 | 7,954.82 | 23,607.06 |
| " Debt Service..... | 3,742.34 | 2,000.00 | - | - |
| Cemetery..... | | | | 500.00 |
| Road Repair Tax..... | 3.81 | - | - | 3,000.00 |
| Highway Improvement Tax. | 3.66 | - | - | 2,500.00 |
| Rejected..... | | 175.76 | 156.57 | 21.98 |
| Total | 27,420.96 | 32,011.25 | 24,659.41 | 51,535.92 |
| Amount paid by C.C.I.Co. | 16,789.47 | 19,649.70 | 14,746.70 | 31,150.72 |
| Percent paid by C.C.I.Co. | 61.3% | 60.6% | 59.8% | 60.44% |

Although the Company's percentage of the total tax raised by Forsyth Township was slightly increased, the Township levy for 1935 was reduced \$4,590.29 from 1934. The Company's taxes were \$2860.23 or 14.5% less than in 1934, due to the lower tax rate

10. WATERSUPPLY
GWINN DISTRICT

The water supply pump station on the Escanaba River operated throughout the year without any delay due to pumping equipment. There were two or three serious delays due to bursting of the mains. These are serious from the fact that the town is without water during the shut down. The school has to be dismissed and the whole town and locations are greatly inconvenienced. The failure of the mains is due to rotting of the wooden pipe which has been in continuous service since its installation in 1908. The leaks are so numerous that a repair crew is employed almost continually. It is possible that new mains may be necessary, which would entail a very large expenditure.

GWINN DISTRICT GENERAL
ANNUAL REPORT
YEAR 1935

16. WATER SUPPLY
GWINN DISTRICT (Cont.)

The State Board of Health has recommended a filtration plant or a new source of water, as the present Escanaba River source requires an abnormal amount of chlorine to make the water safe for consumption.

A test by standpipe was made near the Jopling shaft south of Gwinn but abandoned temporarily when quicksand was encountered. It may be possible to secure the old Jopling shaft and move the pump station to this point. The Jopling was sunk 104 feet to ledge through sand and gravel. By tapping the concrete walls it is possible that an adequate filtered supply can be secured which will satisfy the State Board of Health. The concrete shaft would act as a cistern. The pumping plant erected at the shaft. The owners of the Jopling shaft have been approached to find out if they are willing to turn over the shaft for this purpose. If they are not, it may be necessary to locate the pump station at Johnson lake, a mile and one half southeast of Gwinn.

The following statement gives the cost of operating pump station for the years 1935 and 1934:

| | <u>1935</u> | <u>1934</u> | <u>Increase</u> | <u>Decrease</u> |
|----------------------|-------------|-------------|-----------------|-----------------|
| General Expense | 61.52 | 90.30 | | 28.78 |
| Maintenance Labor | 900.98 | 814.39 | 86.59 | |
| Maintenance Material | 604.06 | 127.75 | 476.31 | |
| Operating Labor | 1,580.46 | 1,495.70 | 84.76 | |
| Operating Supplies | 4,651.65 | 4,942.51 | | 290.86 |
| Total | 7,798.67 | 7,470.65 | 328.02 | |

| | | |
|------------------------------------|-------------|-------------|
| Cost per 1,000 gallons pumped..... | .029 | .028 |
| Gallons Pumped..... | 262,800,000 | 262,800,000 |

General Expense

The larger cost in 1934 was due to ceiling the pump room, to decrease the heating expense.

Maintenance-Labor

The increase in this account is due to more repairs to pipe lines in 1935 and cost of standpiping, in looking for water supply south of Gwinn.

GWINN DISTRICT MINES
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YEAR 1935

16. WATER SUPPLY
GWINN DISTRICT (Cont.)

Maintenance-Material

Same as for Maintenance-Labor.

Operating-Labor

The principal reason for increase here is that there was an increase in wages during 1934 and carried throughout 1935.

Operating-Supplies

The decrease in this account is that in 1934 \$207.92 was charged for coal. There was no change in 1935. Also, in 1934 there was an expenditure of \$95.50 for repairs to chlorinator, and not any in 1935.

The operating costs were charged off as follows:

| | <u>1935</u> | <u>1934</u> |
|-----------------------------|-----------------|-----------------|
| 1. C. C. I. Co. Mines | 30.00 | 0 |
| 2. Water Charges Receivable | 2,215.81 | 2,088.68 |
| 3. Gwinn Townsite | 5,552.86 | 5,381.97 |
| | <u>7,798.67</u> | <u>7,470.65</u> |

While the total cost at Pump Station increased \$476.31 in Maintenance-Material Account, a large portion of this was not a cash expenditure but is shown as a cost item. Included in this is an item of \$220.88 for work performed by men owing rent, which they could not pay. This is a rent credit but was not a cash expenditure.

The most serious delay at the pump station occurred on the night of February 27th 1935 when the main line at Princeton, near the pump station burst. Repair work was carried on during the night and completed the next day.

17. CONDITION
OF
PREMISES

While heretofore it has been the policy of the Township to clean the streets and alleys of the Townsite and the locations, this year a different arrangement had to be made. Under the McNitt Act, all of the township roads and streets were turned over to the County Road Commission. This Board was willing to make only one clean up in the spring, the other cleanings were made

GWINN DISTRICT GENERAL
ANNUAL REPORT
YEAR 1935

17. CONDITION
OF
PREMISES (Cont.)

principally by the Company as the Township had not provided funds for this purpose. In order to clean up Gwinn as well as the Austin and Princeton locations, a force of men owing rent were given the opportunity to work and take credit against their rent account. The men were glad to do this and as the accounts were uncollectable, the Company was nothing out. These men helped repair houses, water mains, broken down fences. They also cleaned streets and alleys and white washed fences. As a result of this work the Townsite and locations presented a very neat appearance.

Kalsomine and paint were given deserving tenants to redecorate their houses.

The rents accrued, collected and repair expense for the Company houses in Gwinn, and in the Austin, Princeton and Gardner Mackinaw locations, follow:

| <u>Gwinn Townsite</u> | <u>1935</u> | <u>1934</u> | <u>1933</u> | <u>1932</u> |
|---|-------------|-------------|-------------|-------------|
| Number of Houses (123) | | | | |
| Rents accrued..... | 7,604.74 | 7,708.63 | 7,249.51 | 8,027.35 |
| Repair Expense.(1)..... | 2,558.91 | 1,508.26 | 597.32 | 597.54 |
| Accrued rent over repair cost..... | 5,045.83 | 6,200.37 | 6,652.19 | 7,429.81 |
| Actual rent collection..... | 6,162.81 | 5,636.79 | | |
| Amt.credited by men owing back rent..(2)..... | 2,095.93 | - | | |
| Total collection..... | 8,258.74 | 5,635.79 | | |

(1) In addition to this repair cost was an item of \$1,374.12 for labor performed by men owing rent. This was not a cash expenditure.
(2) The credit shown \$2095.93 is the total amount credited to Gwinn rents by men owing for rent. This was not a cash outlay.

GWINN DISTRICT GENERAL
ANNUAL REPORT
YEAR 1935

17. CONDITION
OF
PREMISES

| <u>Austin Location</u> | <u>1935</u> | <u>1934</u> | <u>1933</u> | <u>1932</u> |
|--|-------------|-------------|-------------|-------------|
| <u>Number of Houses (51)</u> | | | | |
| Number occupied..... | 32 | 30 | 32 | 33 |
| Rents Accrued,,..... | 1,168.25 | 1,114.00 | 1,452.50 | 1,652.50 |
| Repair Expense (1)..... | 1,328.68 | 92.63 | 47.36 | 151.23 |
| Accrued rent over repair cost..... | 160.43 | 1,021.37 | 1,405.14 | 1,501.27 |
| Actual rent collection | 1,022.13 | 909.00 | 543.00 | |
| Amount credited by men owing back rent.(2).... | 294.28 | | | |
| Total collection..... | 1,316.41 | 909.00 | 543.00 | |

(1) In addition to repair expense was an item of \$252.56 for labor performed by men owing rent. Not a cash expenditure.
 (2) Credit of \$294.28 is total amount credited to Gwinn rents by men owing rent. This was not a cash outlay.

Princeton Location
Number of Houses (14)

| | | | | |
|--|--------|--------|--------|--------|
| Number occupied..... | 11 | 10 | 10 | 8 |
| Rents accrued..... | 437.50 | 495.00 | 499.00 | 480.50 |
| Repair Expense.(1)..... | 436.66 | 80.11 | 26.37 | 85.26 |
| Accrued rent over repair cost..... | .84 | 414.89 | 472.63 | 395.24 |
| Actual rent collection | 458.00 | 427.50 | 229.00 | |
| Amount credited by men owing back rent (2) | 114.18 | | | |
| Total Collection | 572.18 | 427.50 | 229.00 | |

(1) In addition to repair expense was an item of \$10.56 for labor performed by men owing rent. Not a cash expenditure.
 (2) Credit of \$114.18 is total amount credited to Gwinn rents by men owing rent. Not a cash outlay.

In the Austin Location four double houses were sold, 7-8; 48-49; 58-59; 60-61. The increased repair cost for 1935 is accounted for in that eight of the double houses were re-roofed; also No.41 two new hardwood floors.

The increased cost of repairs in the Princeton Location in 1935 was due to making more general repairs, including roof on one house, etc.

GWINN DISTRICT GENERAL
ANNUAL REPORT
YEAR 1935

17. CONDITION
OF
PREMISES (Cont.)

| <u>Gardner Mackinaw Location</u> | <u>1935</u> | <u>1934</u> | <u>1933</u> | <u>1932</u> |
|---|-------------|-------------|-------------|-------------|
| <u>Number of Houses (42)</u> | | | | |
| Number occupied..... | 5 | 5 | 5 | 6 |
| Rents accrued..... | 245.50 | 257.50 | 240.00 | 417.50 |
| Repair Expense..... | 88.21 | 27.79 | 28.20 | 109.35 |
| Excess accrued rents over repair cost..... | 157.29m | 229.72 | 211.80 | 308.15 |
| Actual rent collections..... | 262.00 | 277.00 | 273.50 | |

During the year six double houses were sold, 40-41;42-43;48-49;50-51;52-53.

Statistical statement of rented buildings for 1935

| <u>Location</u> | <u>Vacant</u> | <u>Occupied</u> | <u>Total</u> | <u>Cost of Repairs</u> | <u>Repair cost per house</u> | <u>Rent Accrued</u> | <u>Rent Collected</u> |
|------------------|---------------|-----------------|--------------|------------------------|------------------------------|---------------------|-----------------------|
| Princeton | 3 | 11 | 14 | 447.22 | 31.94 | 437.50 | 572.18 |
| Austin | 19 | 32 | 51 | 1,581.24 | 31.01 | 1,168.25 | 1,316.41 |
| Gardner Mackinaw | 37 | 5 | 42 | 88.21 | 2.10 | 245.50 | 262.00 |
| Gwinn Townsite | 11 | 112 | 123 | 3,933.03 | 31.98 | 7,604.74 | 8,258.74 |
| Total | 70 | 160 | 230 | 6,049.70 | 26.30 | 9,455.99 | 10,409.33 |
| | | | | (1) | | | (2) |

(1) Actual cash expenditure for repairs 4,412.46
 For labor performed in house repairs
 not a cash expenditure 1,637.24
 Total as above 6,049.70

(2) Actual cash received 7,904.94
 Amount credited by journal voucher
 and credited to house rents 2,504.39
 Total as above. 10,409.33

19. GWINN ASSOCIATION
GWINN HOTEL

(1) Gwinn Association

This year the Club House celebrated its twenty-fifth anniversary or a quarter of a century of service to the residents of Gwinn and vicinity. Many of the present members have held membership in the Association since the formal opening, and although are not as active in the social and recreational program as some of the younger members, all remember the many pleasant hours spent in the well equipped building, which was a personal gift from Mr. Mather to the residents of this community and opened to the public in May, 1910.

GWINN DISTRICT GENERAL
ANNUAL REPORT
YEAR 1935

19. GWINN ASSOCIATION
GWINN HOTEL (Cont.)

(1) Gwinn Association (Cont.)

During the year, in order that all departments functioned adequately, necessary supplies were purchased; also, the work of completing the interior redecorating was finished, including the reconditioning of all original furniture. Some new equipment was purchased for the gymnasium, bowling alleys and billiard rooms.

The club has the same arrangement this year, which it has had for several years with the local Board of Education, and receives \$2,500.00 during the year for the use of the gymnasium and supervision of the High School physical education program and for the instruction of their athletic teams.

The membership roll showed a monthly average of 232 members, of which about 130 were employees of the Gardner Mackinaw Mine, and of the remaining number, 41 were unemployed young men, who secured their membership by helping to cut and haul wood for fuel to heat the building.

The Association is under the supervision of Mr. E. L. Miller who has been in charge over sixteen years. He has proved an able and efficient Superintendent.

The report of the Superintendent is included in detail in the annual report of the Welfare Department, so a brief synopsis of the activity program and to what use the building is to the community of Gwinn, is here given:

A close check of the attendance at the building during the year showed an increase for the fall and winter seasons and a decrease for the summer, or that period when Eastern Standard Time is in use throughout this district. Estimated attendance for the year, 67,780.

The Club sponsored and supervised indoor and outdoor activities. Indoor activities included a 6 team adult basketball league, 48 member cribbage league, 22 piece band, 8 team men's and 4 team women's bowling leagues, 20 member women's bridge league, 10 team boy's basketball league, two girl scout troops and play periods in gymnasium for men and women. Outdoor activities included supervision of an 8 team Inter-county baseball league; twilight league for men, junior league for boys and playground ball league for girls; also, the supervision of tennis and horse shoe pitching courts, ice skate rink and Bass Lake Camp.

GWINN DISTRICT GENERAL
ANNUAL REPORT
YEAR 1935

19. GWINN ASSOCIATION
GWINN HOTEL (Cont.)

(1) Gwinn Association (Cont.)

The total number of meetings or social events held at the Club House during the year numbered 322. Of this number, 14 were annual events, 56 meetings by different church organizations, 24 social dances, 41 rehearsals by the band, 89 girl scout meetings and the remainder by such organizations as the Town Club, Women's Study Club, Chamber of Commerce, Sportsmen's Association, school parties, card playing tournaments, etc. One section of the building used as a school kindergarten, held 174 full day sessions, which are not included in the above totals.

The same personnel as in previous years supervised the activities of the Association and looked after the maintenance of the building.

Bass Lake Camp

Although there were not many requests for the use of the cottage, many local residents made use of the grounds and bathing facilities. Fishermen reported better luck on catching small mouthed bass than in previous years. Many residents of Ishpeming, Negaunee, Marquette and Escanaba use Bass Lake as their fishing grounds.

The Cleveland-Cliffs Iron Company arranged for a caretaker to be on duty from July 1st to September 15th.

The complete summary of activities shown in the Welfare Department report, includes 15 picnics by organizations, special picnic of the Gardner Mackinaw employees, use of cottage by 30 Girl Scouts for one week, 90 basket picnics by families and several other activities.

| | |
|---|-------|
| Estimated number of bathers..... | 1,450 |
| Est.attendance at grounds during season | 2,930 |

The grounds were kept in good condition and one boat added.

(2) Gwinn Hotel

The Gwinn Hotel was operated throughout the year under the management of Harold Brown. The proprietor advises that by careful management he has been able to operate without loss or practically to break even.

The Company feels it is necessary to have an hotel in Gwinn and advances what help it can. It has supplied paint & kalsomine which the proprietor has applied himself. The interior is neat and clean.

GWINN DISTRICT GENERAL
ANNUAL REPORT
YEAR 1935

20. GWINN DISTRICT CRUSHER

The crusher operated 77 days in 1935. The ore crushed was as follows:

| | <u>1935</u> | <u>1934</u> |
|------------------|-------------|-------------|
| Gardner Mackinaw | 144,467 | 105,337 |
| Princeton | 0 | 88 |
| Stephenson | 0 | 0 |
| | 144,467 | 105,425 |

The cost for years 1935 and 1934 were as follows:

| | <u>1935</u> | | <u>1934</u> | | <u>Increase</u> | <u>Decrease</u> |
|-----------------------------|---------------|----------------|---------------|----------------|-----------------|-----------------|
| | <u>Amount</u> | <u>Per Ton</u> | <u>Amount</u> | <u>Per Ton</u> | | |
| General Expense | 32.20 | | 31.44 | | | |
| Maintenance | 900.69 | .006 | 771.45 | .007 | | .001 |
| Operating | 3,585.68 | .025 | 2,636.62 | .026 | | .001 |
| Total Optg. Expense | 4,518.57 | .031 | 3,439.51 | .033 | | .002 |
| Switching | 1,458.40 | .010 | 986.00 | .009 | .001 | |
| Grand Total | 5,976.97 | .041 | 4,425.51 | .042 | | .001 |
| Tons crushed | 144,467 | | 105,425 | | | |
| Increase in tonnage crushed | 39,042 | | | | | |

REPUBLIC MINE
ANNUAL REPORT
YEAR 1935

1. GENERAL

The new road, Michigan 95, South of Republic, was completed during the summer. It is a graveled highway and follows Mine Street, cutting across No. 9 Shaft stocking ground. The right of way across the mine property and part of Section 7-46-29 owned by The Cleveland-Cliffs Iron Company and parts of Section 18-46-29 owned by The Cliffs Power & Light Company, was sold to the State Highway Department.

During the year the roof trusses and brick from the old Central Power House were sold. This building was being wrecked and was a hazard, therefore, it is better to have it torn down. The Mine Office building has been sold on a time contract for use as a residence. Dwelling No. 18 was also sold to an employee of the Cliffs Power & Light Company during the summer, but the contract was cancelled on December 31st, 1935 on account of his death.

The company still owns 3 single houses, 2 of which are occupied by very old employees of the old Republic Company.

10. TAXES

| | <u>1935</u> | | <u>1934</u> | |
|---|------------------|---------------|------------------|---------------|
| | <u>Valuation</u> | <u>Taxes</u> | <u>Valuation</u> | <u>Taxes</u> |
| Realty as described on tax receipt | 10,000 | 205.42 | 10,000 | 252.10 |
| Personal Property | 10,000 | 205.42 | 10,000 | 252.10 |
| Lots 71, 72, 85 & 108 | 70 | 1.53 | 95 | 2.45 |
| Total | <u>20,070</u> | <u>412.37</u> | <u>20,095</u> | <u>506.65</u> |
| Collection Fees | | 4.12 | | 5.07 |
| Total Republic Mine | | <u>416.49</u> | | <u>511.72</u> |
| Republic Mine Dwellings (Including Fees) | 1,500 | 31.21 | 1,590 | 38.23 |
| Total Republic Twp. (Inc. Fee) | <u>21,570</u> | <u>447.70</u> | <u>21,595</u> | <u>549.95</u> |
| Rate | | 2.054 | | 2.52 |

Lot 126 in the Village of Republic was sold during the year and the valuation on the miscellaneous lots has been reduced \$25.00, that carried on this lot. It will also be noted that the value on the dwellings was reduced \$90.00 over 1934. Due to the cancelling of the contract to purchase House No. 18, it will no doubt be necessary to pay the taxes on this dwelling amounting to approximately \$16.40. The purchaser of dwelling No. 46 paid the taxes and we are to receive a rebate of \$6.25 included in the above \$31.21 paid on mine dwellings.

The tax rate shows a decrease over the previous year and is due to reduction in debt service.

SPIES VIRGIL MINE
ANNUAL REPORT
YEAR 1935

1. GENERAL

The Spies Virgil Mine remained idle during all of 1935 with the exception of pumping.

Pumping was done wholly on day shift with the Clerk acting as hoisting engineer, and the underground foreman and former pumpmen as operators. The men worked on a staggered basis.

The Idle Expense for the year amounted to \$18,623.75; Operating Expense \$2,412.36; Taxes \$10,481.79; Supply Inventory Adjustment \$502.48, making the total cost for the year \$31,820.38 as compared with \$29,947.43 for 1934. The difference, with the exception of the supply adjustment, is wholly due to loading and shipping from the stockpiles.

No stockpile shipments were made in 1934. In 1935 the mine shipped 64,792 tons, the cost at the mine for loading, analysis and shipping, was \$2,412.36 or \$.0372 per ton.

During the year considerable equipment was removed from the Spies Virgil to other mines of the Company. This consisted of underground haulage motors, underground cars, drill machines and drills, surplus smithing coal and coke, a new top head sheave and other supplies.

2. PRODUCTION
SHIPMENTS &
INVENTORIES

b. Shipments

| <u>Grade of Ore</u> | <u>Stockpile Tons</u> |
|---|---------------------------|
| Virgil Crushed | 64,792 |
| Total 1934 | 0 |
| Increase over 1934 | 64,792 |
| Total shipment to Jan.1,1935 | 545,897 |
| Shipments during 1935 | <u>64,792</u> |
| Total shipments from Mine to Jan.1,1936 | 610,689 |

Loading started along the east side of the North pile where it was expected the ore would average .400 phosphorus, the guaranteed analysis. Previous loading from this pile showed this average. The first two cargoes shipped were considerably below this figure, which made it necessary to move the shovel to the pile northeast of the shaft. Here the loading continued throughout the season and the analysis proved satisfactory.

2. PRODUCTION
SHIPMENTS &
INVENTORIES

c. Stockpile Inventories

| <u>Grade</u> | <u>Tons in Stock</u> |
|-----------------------------|----------------------|
| Virgil Crushed | 247,853 |
| Virgil Crushed (Hi-Sulphur) | 8,879 |
| Total | 256,732 |

f. Ore Statement

| | <u>Virgil Ore</u> | <u>Virgil Hi-Sulphur</u> | <u>Total</u> | <u>1934</u> |
|--------------------|-----------------------|------------------------------|--------------|-------------|
| On Hand Jan.1,1935 | 312,645 | 8,879 | 321,524 | 321,524 |
| Shipments | 64,792 | 0 | 64,792 | 0 |
| Balance 12-31-35 | 247,853 | 8,879 | 256,732 | 321,524 |

1935 - Idle except for pumping throughout the year.
1934 - " " " " "

3. ANALYSIS

| <u>Grade</u> | <u>Tons</u> | <u>Iron</u> | <u>Phos.</u> | <u>Sil.</u> | <u>Mn.</u> | <u>Al.</u> | <u>Lime</u> | <u>Mag.</u> | <u>Sul.</u> | <u>Loss</u> | <u>Moist.</u> |
|-------------------|-------------|-------------|--------------|-------------|------------|------------|-------------|-------------|-------------|-------------|---------------|
| Virgil Crushed | | | | | | | | | | | |
| Dried 212° | | | | | | | | | | | |
| F. | 256,732 | 57.64 | .401 | 7.00 | .19 | 1.84 | .60 | .21 | .078 | 6.50 | |
| Natural | | 53.60 | .372 | 6.51 | .18 | 1.70 | .56 | .19 | .072 | 6.05 | 7.00 |
| Virgil Hi-Sulphur | | | | | | | | | | | |
| Dried 212° | | | | | | | | | | | |
| F. | 8,879 | 57.41 | .424 | 4.09 | | | | | .369 | | |
| Natural | | 53.10 | .392 | 3.78 | | | | | .341 | | 7.50 |

4. ESTIMATE
OF ORE
RESERVES

As there was no mining or development in 1935, the ore reserves remain the same as reported as of December 31, 1934.

a. Developed Ore

Assumption: 12 cu. ft. equals one ton.
10% deduction for rock.
10% deduction for loss in mining.

4. ESTIMATE
OF ORE
RESERVES

a. Developed Ore

| <u>Virgil Ore</u> | <u>Available</u> <u>Tons</u> | <u>Unavailable</u> <u>Tons</u> | <u>Total</u> <u>Tons</u> |
|---|---------------------------------|-----------------------------------|-----------------------------|
| Revised estimate developed ore above 6th Level, Dec.31,1935 | 41,008 | 507,718 | 548,726 |
| Estimate of developed ore between 6th and 8th Levels, Dec.31,1935 | <u>167,318</u> | <u>95,712</u> | <u>263,080</u> |
| Total Developed Ore, Dec.31,1935 | 208,326 | 603,430 | 811,756 |

b. Prospective Ore

| | | | |
|-----------------------------|---------|---------|-----------|
| Between 6th and 8th Levels | 409,151 | 278,755 | 687,906 |
| Total all ore, Dec. 31,1935 | 617,477 | 882,185 | 1,499,762 |

We estimate we will recover between 25% and 33%, in our last mining operations, of the ore above the 6th Level tied up in pillars and shown unavailable.

c. Estimated Reserve Analysis

| | <u>Iron</u> | <u>Phos.</u> | <u>Sil.</u> | <u>Mng.</u> | <u>Alum.</u> | <u>Lime</u> | <u>Mag.</u> | <u>Sul.</u> | <u>Boss</u> | <u>Moist.</u> |
|---------|-------------|--------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|---------------|
| Dried | 57.50 | .425 | 7.00 | .16 | 1.64 | .60 | .30 | .119 | 7.55 | |
| Natural | 51.75 | .382 | 6.30 | .15 | 1.48 | .55 | .26 | .107 | 6.60 | 10.00 |

5. LABOR
AND
WAGES

a. Comments

The mine was idle during the entire year except for pumping. A crew of 12 men including the clerk, were employed on a staggered basis. There has been no captain since September 1934. The total time worked was 252 shifts more than in 1934, of which 211 were on surface and 41 underground. The surface work was principally on stockpile loading, whereas the underground was on ventilation and main level timbering.

There was no change in the wage schedule.

5. LABOR
AND
WAGES

b. Comparative Statement of Wages and Product

| | <u>1935</u> | <u>1934</u> | <u>Increase</u> | <u>Decrease</u> |
|--|--------------|--------------|-----------------|-----------------|
| PRODUCT | 0 | 0 | | |
| NUMBER OF SHIFTS & HOURS | Idle 12 Mos. | Idle 12 Mos. | | |
| <u>AVG. NO. MEN WORKING</u> | | | | |
| Surface | 7 | 7 | | |
| Underground | 5 | 5 | | |
| Total | 12 | 12 | | |
| <u>AVG. WAGE PER DAY</u> | | | | |
| Surface | 3.78 | 3.68 | .10 | |
| Underground | 4.10 | 4.55 | | .45 |
| Total | 3.91 | 4.07 | | .16 |
| <u>WAGES PER MONTH</u> | | | | |
| Surface | 45.36 | 44.16 | 1.20 | |
| Underground | 49.20 | 54.60 | | 5.40 |
| Total | 46.92 | 48.84 | | 1.92 |
| PRODUCT PER MAN PER DAY | None | None | | |
| LABOR COST PER TON | None | None | | |
| AVG. PRODUCT BRK. & TRAM. | None | None | | |
| <u>TOTAL NO. DAYS</u> | | | | |
| Surface | 1,296-9/16 | 1,085-10/16 | 210-5/16 | |
| Underground | 897-4/16 | 856-4/16 | 41 | |
| Total | 2,193-13/16 | 1,941-14/16 | 251-15/16 | |
| <u>AMOUNT FOR LABOR</u> | | | | |
| Surface | 4,900.95 | 3,998.58 | 902.37 | |
| Underground | 3,675.45 | 3,896.28 | | 220.83 |
| Total | 8,576.40 | 7,894.86 | 681.54 | |
| <u>PROPORTION SURFACE TO UNDERGROUND</u> | | | | |
| 1935 | 1 | to | .88 | |
| 1934 | 1 | to | .88 | |
| 1933 | 1 | to | 2.15 | |
| 1932 | 1 | to | 2.23 | |
| 1931 | 1 | to | 2.28 | |
| 1930 | 1 | to | 2.43 | |
| 1929 | 1 | to | 2.74 | |

6. SURFACEa. Building Repairs1. Buildings - Mine

There were practically no repairs to mine buildings. The surface water ditch or culvert was repaired in October at a cost of Labor \$25.52; Supplies \$119.56 or a total of \$145.08.

2. Buildings - Location

The repairs to location houses amounted to very little and were made principally by the tenants. Kalsomine was given for redecorating.

7. UNDERGROUNDd. Timbering

Repairs were made on the 6th Level in April. On account of poor ventilation, it was impossible to make repairs during 1934. When the ventilation was improved in February, 1935, due to improved circulation, it was found that timber repairs were required on the 6th Level to maintain proper circulation. New sets were installed in several places and the caps propped where necessary.

Statement of Timber Used

| <u>Kind</u> | <u>Lineal Feet</u> | <u>Avg. Price Per Foot</u> | <u>Amount 1935</u> | <u>Amount 1934</u> |
|--------------------------------------|--------------------|----------------------------|--------------------|--------------------|
| 8" to 10" | 240 | .07 | 16.80 | - |
| Total Timber 1935 | 240 | .07 | 16.80 | - |
| Total Timber 1934 | - | n - | - | - |
| | | <u>Per 100 Ft.</u> | | |
| 7' Lagging | 875 | .678 | 5.93 | - |
| Poles | 2,518 | 1.3877 | 34.94 | - |
| Total Lagging & Poles 1935 | 3,393 | 1.204 | 40.87 | |
| " " " 1934 | - | - | - | - |
| Cost of Timber, Lagging & Poles 1935 | | 57.67 | | |
| " " " " 1934 | | - | | |

h. Ventilation

During the latter part of 1934, the ventilation at the 3rd and 8th Level pump stations was very poor. It was also so bad in the shaft that it was almost impossible to keep a carbide lamp burning, due to lack of oxygen.

It was realized that the trouble was due to lack of proper circulation from the Spies shaft to the old Virgil Shaft. As the circulation had always been better in winter than summer, due to the difference in temperature between the mine and the

7. UNDERGROUND

h. Ventilation

surface, it was decided to try to improve the ventilation in the hoisting shaft during the winter.

In February, the openings into the mine from the Spies Shaft were sealed on the 3rd, 4th and 6th Levels and the top of the Virgil shaft uncovered. The ventilation improved immediately and remained good over the entire year along the air course, i.e., through the 8th Level and up the Virgil Shaft.

The natural ventilation is supplemented by a surface blower which runs to the 3rd and 8th Level pump houses.

i. Pumping

Both the 3rd and 8th Level pumps were operated throughout the year on one 8 hour shift.

The water pumped for the year amounted to 86,439,400 gallons as compared with 73,856,500 gallons in 1934, an increase of 12,582,900 gallons.

10. TAXES

The following tabulation is a comparative statement of taxes paid by the Company in Iron County for the years 1935 and 1934:

| <u>Description</u> | <u>1935</u> | | <u>1934</u> | |
|---|------------------|--------------|------------------|--------------|
| | <u>Valuation</u> | <u>Taxes</u> | <u>Valuation</u> | <u>Taxes</u> |
| <u>Iron River Township</u> | | | | |
| NE $\frac{1}{4}$ of NW $\frac{1}{4}$, Sec.24,43-35, 40 acres | | | | |
| SE $\frac{1}{4}$ of NW $\frac{1}{4}$ of "24, " 40 " | | | | |
| Spies Dwellings..... | 5,000 | 103.30 | 5,000 | 100.75 |
| <u>Spies Virgil (a)</u> | | | | |
| E $\frac{1}{2}$ of NW $\frac{1}{4}$ of Sec.24,43-35 (Spies) | | | | |
| SW $\frac{1}{4}$ of NW $\frac{1}{4}$ of " 24, " (Virgil) | 100,000 | 2,066.00 | 100,000 | 2,015.00 |
| Stockpile,Supplies,Eqpt. | 370,000 | 7,644.20 | 370,000 | 7,455.50 |
| Total Spies Virgil..... | 470,000 | 9,710.20 | 470,000 | 9,470.50 |
| (a) Total Iron River Twp. | 475,000 | 9,813.50 | 475,000 | 9,571.25 |
| Rate..... | | 2.91 | | 2.105 |
| <u>Ravenna-Prickett</u> | | | | |
| <u>City ofnCrystal Falls</u> | | | | |
| W $\frac{1}{2}$ of SE $\frac{1}{4}$ of Sec.19,43-32..... | 1,100 | 32.03 | 1,000 | 28.06 |
| Rate per \$100.00..... | | 2.91 | | 2.81 |

10. TAXES

| | <u>1935</u> | | <u>1934</u> | |
|--|------------------|--------------|------------------|--------------|
| | <u>Valuation</u> | <u>Taxes</u> | <u>Valuation</u> | <u>Taxes</u> |
| <u>Crystal Falls Township</u> | | | | |
| <u>Ravenna Prickett</u> | | | | |
| SW $\frac{1}{4}$ of Sec. 19, 43-32.....) | | | | |
| NE $\frac{1}{4}$ of SE $\frac{1}{4}$ 24, 43-33.....) | 66,000 | 1,514.70 | 74,800 | 1,602.10 |
| SW $\frac{1}{4}$ of NE $\frac{1}{4}$ 19, " | 200 | 4.59 | 200 | 4.33 |
| SE $\frac{1}{4}$ of NE $\frac{1}{4}$ 19, " | 200 | 4.59 | 200 | 4.33 |
| SW $\frac{1}{4}$ of NW $\frac{1}{4}$ 19, " | 200 | 4.59 | 200 | 4.33 |
| SE $\frac{1}{4}$ of NW $\frac{1}{4}$ 19, " | 200 | 4.59 | 200 | 4.33 |
| TOTAL..... | 66,800 | 1,533.06 | 74,800 | 1,619.42 |
| Rate per \$100.00..... | | 2.295 | | 2.17 |
| Total Ravenna Prickett..... | 67,900 | 1,565.09 | 75,800 | 1,647.48 |
| <u>Distribution of Charges</u> | | | | |
| C.C.I.Co. Proportion..... | 51,400 | 1,186.42 | 57,300 | 1,246.95 |
| Michigan Mineral Lands..... | 16,500 | 378.67 | 18,500 | 400.53 |

(a) The mineral valuation is not divided between the Spies and Virgil and the surface of the Spies is included in the mineral assessment of the Virgil.

| | | | | |
|--|---------|--------|---------|--------|
| <u>Village of Mineral Hills</u> | | | | |
| <u>Spies Lease</u> | | | | |
| SE $\frac{1}{4}$ of NW $\frac{1}{4}$ of Sec. 24, 43-35...) | 5,000 | 8.22 | 5,000 | 7.17 |
| NE $\frac{1}{4}$ of NW $\frac{1}{4}$ of " 24, " ...) | | | | |
| Dwellings.....) | | | | |
| <u>Virgil Mine Lease</u> | | | | |
| (a) SW $\frac{1}{4}$ of NW $\frac{1}{4}$ of Sec. 24, 43-35 | 100,000 | 164.17 | 100,000 | 143.32 |
| Stockpile, Supplies, Equipt.... | 370,000 | 607.42 | 370,000 | 530.28 |
| Total Opt. Spies Virgil.. | 470,000 | 771.59 | 470,000 | 673.60 |
| Total Mineral Hills..... | 475,000 | 779.81 | 475,000 | 680.77 |
| Rate..... | | 1.6417 | | 1.4332 |

The Village of Mineral Hills is in Iron River Township. The valuations as shown here are the same valuations shown by Iron River Township.

(a) The valuation of 100,000 includes both the Spies and Virgil descriptions noted above for the year 1935 and 1934. Not divided by tax appraiser and any division would be arbitrary.

**14. MAINTENANCE
AND REPAIRS****b. Hoisting Equipment**

Took off skip and changed rope over to the cage compartment on account of poor condition of cage rope.

Repaired pulley stands and replaced two pulley stand sheaves.