

TILDEN MINE
ANNUAL REPORT
YEAR - 1949

2. PRODUCTION, SHIPMENTS & INVENTORIES (Cont.)

b. Shipments

	<u>Pocket</u>	<u>Stockpile</u>	<u>Total</u>	<u>Total Last Year</u>
Tilden Silica	21,931	47,515	69,446	78,641
Tilden Low Phosphorus	9,373	--	9,373	43,750
Total	31,304	47,515	78,819	122,391
Total Last Year	88,912	33,479	122,391	
Decrease	57,608		43,572	
Increase		14,036		

c. Stockpile Inventories

<u>Grade</u>	<u>Balance on Hand Dec. 31, 1948</u>	<u>Stocked 1949</u>	<u>Shipped from Stockpile 1949</u>	<u>Balance on Hand Dec. 31, 1949</u>
Tilden Silica	57,342	57,199	47,515	67,026
Tilden Low Phos.	--	--	--	--
Total	57,342	57,199	47,515	67,026

e. Product by Months

<u>Month</u>	<u>Days Operated</u>	<u>Average Tonnage Per 8-Hr. Shift</u>	<u>Total Tons</u>
June	10	1606	16,056
July	16	1728	27,657
August	16	1509	24,150
September	12	1720	20,640
Total	54	1639	88,503

The average daily product showed a decrease as compared with 1948 on account of stocking a larger proportion of the product. Sixty-five per cent of the product was stocked in 1949 against only 37% in 1948 and approximately 200 tons more per shift can be produced when loading direct into cars.

Distribution of Product by Pits

	<u>1949</u>	<u>1948</u>	<u>Decrease</u>
West Pit(lower bench)	54,678	62,674	7,996
East Pit	28,245	59,280	31,035
Summit Pit	5,580	18,738	13,158
Total	88,503	140,692	52,189

f. Ore Statement

	<u>Tilden Silica</u>	<u>Tilden Low Phos.</u>	<u>Total</u>	<u>Total Last Year</u>
On hand January 1, 1949	57,342	--	57,342	39,041
Output for Year	79,130	9,373	88,503	140,692
Total	136,472	9,373	145,845	179,733
Shipments	69,446	9,373	78,819	122,391
Balance on hand December 31, 1949	67,026	-	67,026	57,342
Decrease in output			52,189	

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2. PRODUCTION, SHIPMENTS & INVENTORIES

f. Ore Statement (Cont.)

Comparison of Working Schedules, 1947 to 1949

1949 - Pit idle January 1st to June 20th. Operated June 20th to 29th on 6 day per week schedule, June 29th to September 20th on 5 days per week. Idle September 20th to December 31st. Mine also idle August 14th to 20th for vacation. During both long idle periods a small crew was employed on repairs to equipment, except during the strike from October 1st to November 14th.

1948 - Pit idle January 1st to May 17th. Operated May 17th to August 31st. During part of the idle time a small crew was engaged in repairing, drilling, and stockpile loading. There was no work during January, February, March, and December.

1947 - Pit idle January 1st to July 7th. A small crew was employed during May and June on repairs and stockpile loading, the latter starting on May 14th. Operating one 8-hour shift six days per week July 7th to November 24th. Drilling was then also suspended and only a small crew remained in December for the necessary repairs.

g. Delays

The pit was idle July 18th on account of cleaning up and installing temporary electrical equipment after the fire in office, shop, and dry building.

3. ANALYSIS

a. Average Mine Analysis on Shipments

Grade	Iron	Phos.	Sil.	Mang.	Alum.	Lime	Mag.	Sul.	Loss by Ignition	Moist.
Tilden Silica	40.00	.037	41.34	.08	.70	.25	.19	.013	.18	1.60
Tilden Low Phos.	36.50	.013	46.60	.07	.70	.08	.11	.012	.11	1.34

b. Average Analysis on Straight Cargoes

	Mine			Lake Erie	
	Iron	Phos.	Sil.	Iron	Moist.
Tilden Silica	39.89	.039	41.05	40.06	2.20
Tilden Low Phos.	36.40	.014	46.61	36.38	1.16

c. Analysis of Ore in Stock

	Iron	Phos.	Sil.	Mang.	Alum	Lime	Mag.	Sul.	Loss	Moist.
Tilden Silica	40.04	.043	41.29	.08	.70	.25	.19	.020	.18	1.60

4. ESTIMATE OF ORE RESERVES

a. Developed Ore

1. West Pit - Above floor at 1430'

Assumption: 13 Du. Ft. equal one ton.

Total Stripped & Developed as of January 1, 1949	1,480,811
Mined during 1949	54,678
Total Remaining December 31, 1949	1,426,133

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4. ESTIMATE OF ORE RESERVES

a. Developed Ore (Cont.)

2. East Pit - Above floor at 1440'

Assumption: 14 Cu. Ft. equal one ton.

Total Stripped & Developed as of Jan. 1, 1949 1440' to 1500'		1,278,320 Tons
Total Stripped & Developed above 1500' as of Jan. 1, 1949	1,776,288 Tons	
Mined during 1949	<u>28,245 "</u>	
Total Remaining above 1500' as of Dec. 31, 1949		<u>1,748,043 "</u>
Total Remaining above 1440' as of Dec. 31, 1949		<u>3,026,363 Tons</u>

3. Summit Pit - Above floor at 1620'

Assumption: 14 Cu. Ft. equal one ton.

Total Stripped & Developed as of Jan. 1, 1949		407,334 Tons
Mined during 1949		<u>5,580 "</u>
Total Remaining as of Dec. 31, 1949		<u>401,754 Tons</u>

Total Developed Ore as of Dec. 31, 1949

West Pit	1,426,133 Tons
East Pit	3,026,363 "
Summit Pit	<u>401,754 "</u>
Total all Pits	<u>4,854,250 "</u>

Broken ore in pits is included in the above reserves.

	<u>West Pit</u> <u>Lower Bench</u>	<u>East Pit</u>	<u>Summit Pit</u>	<u>Total</u>
December 31, 1949	55,877	39,643	28,976	124,496

Total Prospective Ore

West Pit
Balance remaining to be stripped 500,000 Tons

East & Summit Pits
Total above floor at 1500' as of Jan. 1, 1950 2,235,500 "

Total Prospective Ore Jan. 1, 1950 2,735,500 "

c. Estimated Analysis of Reserves

	<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>
1. <u>West Pit</u>										
Dried	39.17	.050	41.91	.09	.90	.20	.22	.009	.24	
Natural	38.50	.049	41.20	.09	.88	.20	.22	.009	.24	1.70
2. <u>East Pit</u>										
Dried	37.00	.020	45.00	.09	.54	.20	.17	.009	.34	
Natural	36.50	.020	44.40	.09	.53	.20	.17	.009	.34	1.34
3. <u>Summit Pit</u>										
Dried	36.00	.015	46.00	.09	.54	.20	.17	.009	.34	
Natural	34.50	.015	45.40	.09	.54	.20	.17	.009	.34	

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4. ESTIMATE OF ORE RESERVES (Cont.)

f. Estimate of Production

Production in the latter years has had to be limited by the amount required to be shipped plus the amount that could be stocked, and the maximum capacity of the present stockpile grounds is approximately 75,000 tons. The maximum production possible, however, is as follows:

	<u>5 Days Per Week</u>	<u>6 Days Per Week</u>
Single Shift	224,000 Tons	282,000 Tons
Double Shift	400,000 "	500,000 "

It would be possible to obtain from 50,000 tons on single shift to 100,000 tons on double shift of low phosphorus ore grading .015.

5. LABOR & WAGES

a. Comments

There was no increase in wages during 1949, but on October 1st a strike was called to try and obtain a free pension and social welfare program. Work was resumed on November 14th when the union accepted a plan calling for \$100 per month including Social Security for one 65 years of age with twenty-five years service. The social welfare plan remained as before.

Production at the mine had already ceased on September 20th so only the repair crew was actually affected, although most of the operating crew had as yet not been transferred to other properties.

For the first time in several years the pit was closed from August 14th to 20th and the men received their vacation pay based on six days per week although the mine had been on a five day operating schedule since June 29th.

- 4 men, or $17\frac{1}{2}\%$, received pay for three weeks.
- 14 men, or 61% , received pay for two weeks.
- 4 men, or $17\frac{1}{2}\%$, received pay for one week.
- 1 man was ineligible, having worked less than one year.

A change in the office personnel occurred on October 1st when the mine clerk, Mr. Vivian Perring, who had been with the company thirty-seven years, retired and was replaced by Mr. Arnold Solem, formerly at the Athens Mine.

b. Comparative Statement of Wages and Product

	<u>1949</u>	<u>1948</u>	<u>Incr.</u>	<u>Decr.</u>
Product	88,503	140,692		52,189
Number of Days Operated	54	76		22
Average Number of Men Working	25	24	1	
Average Hourly Rate	1.505	1.488	.017	
Tons Per Man Per Hour	5.326	7.684		2,358
Labor Cost Per Ton	.282	.193	.089	
Amount Paid for Labor	25,004.64	27,238.88		2,234.24

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5. LABOR & WAGES (Cont.)

c. Nationality of Employees

	<u>American Born</u>	<u>Foreign Born</u>	<u>Total</u>
English.....	9	1	10
Finnish.....	8	1	9
Swedish.....	3	-	3
Irish.....	3	-	3
French Canadian.....	3	-	3
German.....	2	-	2
Scotch.....	1	-	1
	<u>29</u>	<u>2</u>	<u>31</u>

7. OPEN PIT OPERATIONS

a. Stripping

No stripping occurred during 1949 nor will there be any further amount necessary until a considerably larger annual tonnage is required.

b. Drilling, Blasting & Explosives

1. Drilling

On account of the small production from the Tilden Pit, both in 1948 and 1949, it was only necessary to drill one row of holes in the West Pit, and this row required less holes than formerly on account of preserving the road along the North side of the pit.

There are now holes ready to blast in both East and West Pits, therefore the drilling program for 1950 will also be light.

As all the drilling was done on level ground on the upper floor of the West Pit with faster set ups where there was less back bread and thus more solid to start the hole, the footage increased and the cost decreased.

Cost of Operating 9-inch Churn Drills in 1949

	Total Footage Drilled				826	
	<u>Operating</u>	<u>Labor</u>	<u>Supplies</u>	<u>Total</u>	<u>Cost</u>	<u>Per Foot</u>
Drilling	\$1,089.92	\$ 63.93	\$1,153.85	1.397		
Sharpening Bits	413.82	251.35	665.17	.805		
Electric Power		50.00	50.00	.061		
Pipe & Fittings		12.60	12.60	.015		
Truck & Tractor	109.32	37.63	146.95	.178		
Total Operating	<u>\$1,613.06</u>	<u>\$ 415.51</u>	<u>\$2,028.57</u>	<u>2.456</u>		
<u>Maintenance</u>						
Drills	138.81	17.17	155.98	.189		
Bit Dresser	173.52	217.40	390.92	.473		
Total Maintenance	<u>312.33</u>	<u>234.57</u>	<u>546.90</u>	<u>.662</u>		
Grand Total	<u>\$1,925.39</u>	<u>\$ 650.08</u>	<u>\$2,575.47</u>	<u>3.118</u>		

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7. OPEN PIT OPERATIONS

b. Drilling, Blasting & Explosives(Cont.)

Comparison of Footages and Costs

	<u>1 9 4 9</u>			<u>1 9 4 8</u>		
	<u>Footage Drilled</u>	<u>Footage Per 8-hr Shift</u>	<u>Cost Per Foot</u>	<u>Footage Drilled</u>	<u>Footage Per 8-hr Shift</u>	<u>Cost Per Foot</u>
West Pit, Lower Bench	826	20.65	3.118	1,444	19.25	3.199
East Pit				2,856	17.96	3.577
Total	826	20.65	3.118	4,300	18.37	3.450

Footage Obtained from Bits

	<u>1 9 4 9</u>		<u>1 9 4 8</u>	
	<u>Bits Used</u>	<u>Footage Per Bit</u>	<u>Bits Used</u>	<u>Footage Per Bit</u>
West Pit, Lower Bench	84	9.83	169	8.54
East Pit, North Side			350	8.16
Total	84	9.83	519	8.28

2. Blasting

There was only one blast put off in 1949 as compared with three in 1948, but the total amount of broken ore was the same, as last years blasts were all fairly small with a fewer number of holes involved in each. The cost per ton blasted showed an increase due to heavier burden on the holes and more powder required per ton of ore.

Primary Blasting

<u>Location</u>	<u>Date</u>	<u>No. of Holes</u>	<u>Footage Blasted</u>	<u>Estimated Tonnage</u>	<u>Pounds Explosives</u>	<u>Estimated Tons Ore Per Pound Explosive</u>
West Pit, Lower Bench	7/29/49	32	2,039	86,900	37,650	2.31

STATEMENT OF EXPLOSIVES USED FOR YEAR 1949

Primary Blasting

<u>Kind</u>	<u>Quantity</u>	<u>Price</u>	<u>Amount</u>
Gelemite 7½	lbs. 22,100	.15	\$3,315.00
Hercomite Bag X 7½	" 15,550	.14	2,177.00
Total Powder	37,650	.1458	5,492.00

Blasting Supplies

Primacord Bickford Fuse, Regular M ft	2,000	32.00	64.00
Primacord Bickford Fuse, Wire Bound	3,000	41.50	124.50
Total Blasting Supplies	5,000	37.70	188.50

Total All Explosives \$5,680.50

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7. OPEN PIT OPERATIONS

b. Drilling, Blasting & Explosives

2. Blasting (Cont.)

	<u>1949</u>	<u>1948</u>
Tons of Ore Blasted	86,900	85,550
Tons of Ore per Lb. of Powder	2.31	2.53
Cost per Ton for Powder	.0632	.0556
Cost per Ton for Blasting Supplies	.0022	.0019
Cost per Ton for All Explosives	.0654	.0575
Average Price per Lb. for Powder	.1458	.14103

Secondary Blasting

<u>Kind</u>		<u>Quantity</u>	<u>Price</u>	<u>Amount</u>
60% Gelatin	lbs.	1,525	.1648	\$251.38
60% H.P. Gelatin 5x5"	"	2,075	.2000	415.00
Total Powder	lbs.	<u>3,600</u>	<u>.1851</u>	<u>\$666.38</u>

Blasting Supplies

Fuse	M ft.	7,896	8.50	67.14
#6 Blasting Caps	M	1,400	14.46	20.24
Electric Blasting Caps	C	<u>50</u>	<u>9.90</u>	<u>4.95</u>
Total Blasting Supplies				\$ 92.33

Total Secondary Explosives

\$758.71

	<u>1949</u>	<u>1948</u>
Product	88,503	140,692
Pounds of Powder per Ton of Ore	.0407	.0331
Cost per Ton for Powder	.0075	.0049
Cost per Ton for Fuse & Caps	.0011	.0008
Cost per Ton for All Explosives	.0086	.0057
Average Price per Lb. for Powder	.1851	.1637
 Total All Explosives Used at Pit	 \$6,439.21	 \$5,735.19

Comparison of Blasting Costs

	<u>Primary Blasting</u>	<u>Secondary Blasting</u>
	<u>Cost per Ton Blasted</u>	<u>Cost per Ton Produced</u>
1949	.0654	.0086
1948	.0575	.0057
1947	.0715	.0042
1946	.0494	.0098
1945	.0416	.0052
1944	.0423	.0074

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7. OPEN PIT OPERATIONS(Cont.)

g. Loading Operations

The loading was done with two shovels, moving them to and from the various pits and the stockpile. There was only a small shipment of low phosphorous grade ore during 1949 and therefore there was less moving of the shovels with a consequently better cost. Six fifteen-ton Euclid trucks were used for transportation of the ore to the crusher and also for stocking.

The locality and tonnages for the two shovels loading during 1949 was distributed as follows:

<u>Unit</u>	<u>Tons</u>	<u>Locality</u>
No. 52 Shovel	47,515	Stockpile
	2,408	East Pit, Upper bench
	5,580	Summit Pit
	<u>52,116</u>	West Pit, Lower bench
Total	107,619	
No. 46 Shovel	25,837	East Pit, Upper bench
	<u>2,562</u>	West Pit, Lower bench
Total	28,399	

8. COST OF OPERATIONS

a. Comparative Mining Cost

	<u>1949</u>	<u>1948</u>
Production	88,503	140,692
Operating Cost	.765	.720
General Mine Expense	.202	.123
Stocking Ore	<u>.020</u>	<u>.014</u>
Cost of Production	.987	.857
Depreciation - Movable Equipment	.000	.000
Depreciation - Plant & Equipment	.069	.061
Depreciation - Motorized Equipment	.005	.015
Depletion - Original Cost	.003	.002
Amortization of Development	.004	.003
Amortization of Stripping	.020	.020
Taxes	.068	.046
Loading from Stockpile	<u>.014</u>	<u>.008</u>
Total Cost at Mine	1.170	1.012
Average Daily Product	1,639	1,851
Tons per Man per Day	42.61	61.47
Number of Days Operated(1 8-hr Shift)	54	76

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8. COST OF OPERATING (Cont.)b. Detailed Cost ComparisonPIT OPERATING (Combined operating & Idle Expense)

<u>Direct Ore</u>	<u>1949</u>		<u>1948</u>	
	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>
Drilling & Blasting	12,067.64	.136	18,085.58	.129
Power Shovels, Operating	6,183.76	.070	7,740.93	.055
Power Shovels, Maintenance	6,363.67	.072	12,982.21	.092
Euclid trucks, Operating	3,355.42	.038	6,734.57	.048
Euclid trucks, Maintenance	5,876.78	.067	4,174.96	.030
R.D. Tractors, Maintenance	564.35	.006	175.77	.001
<u>Total Direct Ore</u>	<u>34,411.62</u>	<u>.389</u>	<u>49,894.02</u>	<u>.355</u>
<u>General Pit Expense</u>				
Pumping & Drainage	117.90	.001	--	--
Water Supply	46.99	.001	87.37	.001
Crushing & Screening	14,378.65	.162	30,142.87	.214
General Open Pit Expense	14,825.16	.168	16,716.93	.119
Open Pit Superintendence	3,925.00	.044	4,406.89	.031
Waste Pile Expense	--	--	49.64	.000
Buildings	6.89	--	--	--
<u>Total General Expense (Pit)</u>	<u>33,300.59</u>	<u>.376</u>	<u>51,403.70</u>	<u>.365</u>
TOTAL PIT OPERATION	67,712.21	.765	101,297.72	.720
Stocking Tilden Crushed Ore	<u>1,705.48</u>	<u>.020</u>	<u>2,000.92</u>	<u>.014</u>
GRAND TOTAL	69,417.69	.785	103,298.64	.734
<u>General Mine Expense</u>				
Mining Engineering	1,387.58	.016	1,347.59	.010
Mechanical & Electrical Engineering	476.72	.005	125.03	.001
Analysis & Grading	825.58	.009	1,523.96	.011
Safety Department	174.49	.002	99.99	.001
Special Expense	437.57	.005	373.40	.003
Ishpeming Office Expense	983.25	.011	1,366.17	.010
Local & General Welfare	171.02	.002	207.09	.001
Mine Office	5,678.55	.064	5,745.92	.041
Insurance	2,800.73	.032	1,419.10	.010
Personal Injury Expense	1,282.25	.014	1,259.20	.009
Social Security Taxes	1,027.88	.012	1,301.14	.009
Geological	94.44	.001	76.75	.000
Employees' Vacation Pay	2,576.04	.029	2,463.12	.017
<u>Total General Mine Expense</u>	<u>17,916.10</u>	<u>.202</u>	<u>17,308.46</u>	<u>.123</u>
COST OF PRODUCTION	87,333.79	.987	120,607.10	.857
Taxes	5,936.68	.068	6,459.79	.046
TOTAL	93,270.47	1.055	127,066.89	.903

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8. COST OF OPERATING

b. Detailed Cost Comparison (Cont.)

The increase in cost was due entirely to the large decrease in production. There was less repairing done to equipment in 1949 when the cost of idle expense was only approximately \$37,000.00 as compared with \$61,000.00 in 1948.

Cost of Production

<u>Operating Pit</u>	<u>1949</u>		<u>1948</u>	
	<u>Cost Per Ton</u>	<u>Per Cent</u>	<u>Cost Per Ton</u>	<u>Per Cent</u>
Labor	.522	52.9	.411	48.0
Supplies	.465	47.1	.446	52.0
Total	.987	100.0	.857	100.0

Days & Shifts Operating

	<u>1949</u>	<u>1948</u>
One 8-hour	54	76

Production

	<u>1949</u>	<u>1948</u>
Tons Produced	88,503	140,692
Tons Shipped from Pocket	31,304	88,912
Tons Shipped from Stockpile	47,515	33,479
Tons Stocked	57,199	51,780
Balance on hand December 31st	67,026	57,342
Average Product per Shift	1,639	1,851
Tons per Man per Day	42.61	61.47

Detail of Accounts

Power Shovels, Maintenance

	<u>1949</u>	<u>1948</u>
Amount	6,363.67	12,982.21
Cost per Ton	.070	.092

Both of the shovels had a thorough overhauling in the fall of 1948 and approximately \$2000.00 of the money spent in 1949 was for completion of the work started last year. With the small product this year the only major item was the purchase of a new dipper for the number fifty-two shovel.

Euclid Truck Maintenance

	<u>1949</u>	<u>1948</u>
Amount	5,876.78	4,174.96
Cost per Ton	.067	.030

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8. COST OF OPERATING

b. Detailed Cost Comparison

Euclid Truck Maintenance(Cont.)

Two of the trucks rented to the Mather "A" Mine during the winter were in quite bad shape by spring and most of the expense was incurred on these units. There was more spent for tires than formerly as the type of work done the last two years at the Mather Mine is much harder on tires than the work at the Tilden. The spinning of the wheels in the soft ore and striking chunks of hard ore or rock tears small pieces out of the tread and eventually ruins the casing.

Crushing & Screening

	<u>1949</u>	<u>1948</u>
Amount	14,378.65	30,142.87
Cost Per Ton	.162	.214

Considerable repairs were necessary to the main crusher, but on account of the strike the total amount of money spent to the end of the year showed a decrease. However, it will be necessary to work a small crew for several months in 1950 to complete the work.

General Open Pit Expense

	<u>1949</u>	<u>1948</u>
Amount	14,825.16	16,716.93
Cost per Ton	.168	.119

The cost per ton for this account was high because of the small production. With an operation of this type, part of the crew have to be placed on general work when a break down occurs as it would not be good policy to lay them off or transfer them for one or two shifts.

Idle & Winter Expense

This expense is combined with the operating cost in the years total but the following table is inserted to show the distribution as a matter of record.

	<u>Labor</u>	<u>Supplies</u>	<u>Total</u>
January	1,675.64	730.16	2,405.80
February	1,674.71	1,515.20	3,189.91
March	2,191.60	1,135.22	3,326.82
April	2,371.73	3,460.31	5,832.04
May	2,242.10	2,630.48	4,872.58
October	2,205.35	1,635.51	3,840.86
November	3,418.30	1,298.19	4,716.49
December	3,832.76	5,281.00	9,113.76
Total	<u>19,612.19</u>	<u>17,686.07</u>	<u>37,298.26</u>

	<u>1949</u>		<u>1948</u>	
	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
Labor	19,612.19	52.6	28,435.73	46.7
Supplies	17,686.07	47.4	32,732.67	53.3
Total	<u>37,298.26</u>	<u>100.0</u>	<u>61,168.40</u>	<u>100.0</u>

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10. TAXES

Tilden Township

Tilden Mine

	<u>1949</u>		<u>1948</u>	
	<u>Valuation</u>	<u>Taxes</u>	<u>Valuation</u>	<u>Taxes</u>
N ¹ / ₂ of Sec. 26, 47-27 320 Acres	140,000	2,789.51	175,000	3,794.14
Personal Supplies & Equipment	155,000	3,088.39	120,000	2,601.69
Collection Fees		58.78		63.96
Total	<u>295,000</u>	<u>5,936.68</u>	<u>295,000</u>	<u>6,459.79</u>

11. PERSONAL INJURY

There were no lost time accidents at the Tilden Mine in 1949.

12. NEW CONSTRUCTION AND
PROPOSED NEW CONSTRUCTION

There was no new construction in 1949, nor is there any proposed for 1950.

13. EQUIPMENT AND PROPOSED
NEW EQUIPMENT

There was no new equipment purchased in 1949, nor are there any purchases anticipated for 1950.

ATHENS MINE
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1. GENERAL:

The Athens Mine operated on a schedule of six days per week on a full two-shift basis for the first six months of the year and on a five day two-shift basis during the last six months. In addition to the regular two-shift basis a number of men worked on a three-shift schedule, developing and drawing ore from the No. 2 Block area in the Corbit Lease. During the month of January production increased to such an extent that more ore was being mined than could be hoisted. To reduce production, eight gangs of miners that were working on the night shift were cut off. Six of the miners from these working places were transferred to other mines and were later recalled. The other men made idle were distributed through out the mine to bolster short contracts and to increase the efficiency in distributing supplies. Production for the first six months of the year was held just about to the capacity of the hoist, due to the successful block caving of the south half of the Corbit Lease. After much preparation and development for block caving the north half, great pressure developed in the area and practically all development work was lost eliminating any chance of block caving. Mining was then continued on a modified block caving system consisting of putting transfer drifts at closer intervals and drawing from mills directly into the transfer drifts. This system has been fairly successful but the pressure is so great that the repair cost exceeds that of mining. During the long idle period of the strike practically all sub-drifts in the block area closed in so that it was not until the latter part of December that this territory returned to normal production. It is hoped that a production of about 15 thousand tons per month can be maintained for the next few months to deplete the reserves above the Fourth Level in the Corbit Lease.

The production from the Athens Mine in 1949 was 550,000 tons as compared with 506,600 tons in 1948. When it is taken into consideration that the mine operated the last six months of the year on a five day per week schedule as compared with a six day per week schedule the entire year in 1948 and also being idle for six weeks because of a strike the increase was very large. A new record was made for the greatest tonnage hoisted in any one month and for the greatest number of tons per man for any one year since the mine was brought into being.

The great increase was due to block caving, better management and closer supervision throughout the year. The underground working conditions were improved greatly during the year as well as the morale of all the men. In the wet, muddy and uncomfortable working places the water was intercepted and piped to the level and the bottom of the drifts planked, making the men more satisfied and improving efficiency. The captain, underground foremen, shiftbosses and the other foremen should be highly commended for the way they have directed operations, bringing the Athens up to where it compares favorably with the best of the Company operated mines.

During the year the Eight Level main haulage drifts was extended west to develop the new ore body north of the large E - W Dike. The development of the ore above the level has reached the point where they will be producing from an elevation 150 feet above the Eight Level, shortly after the first of the year. Production in this territory will start to compensate for loss of production from the Corbit Lease which is gradually decreasing.

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1. GENERAL: (Cont'd)

The cost of timbering and repairing throughout the mine has been very heavy during the past year, due to excessive pressure, especially the Fourth Level in the Corbit Lease. The six week Idle period during the strike contributed greatly to causing much of this repair work.

There was less development work done in 1949 than in 1948. In 1949 there was 3,017 feet of ore development and 1,596 feet of rock development as compared with 4,972 feet of ore and 2,366 feet of rock development in 1948. The decrease was due to the fact that Block No. 2 which was mostly developed in 1948 required so much more development work than any other system of mining.

There was considerable Diamond Drilling with bortz bits done at the Athens Mine during 1949. Nine Holes with a total footage of 1,955 feet were drilled on the elevations of the Seventh, Eighth and Tenth Levels, all to determine the limits of the new ore body north of the large E - W Dike. This drilling project increased the gross estimate of tonnage in the new deposit by 458,294 tons.

The underground workings at the Athens Mine at the present time are in very good condition and prospects are bright for good production during 1950, if the results of subsidence does not interfere with hoisting facilities. I am afraid though that subsidence will be very much accelerated in 1950 as at the present time small cracks are developing in the Engine House floor and we know that the shaft is moving and now seems that buildings are moving faster than previously.

2. PRODUCTION SHIPMENTS AND INVENTORIES

a. Production by Grades

	<u>1949</u>	<u>1948</u>	<u>Increase</u>	<u>Decrease</u>
Athens Ore	189,950	313,626		123,676
Mitchell Lease Ore	84,157	116,991		32,834
Corbit Lease Ore	272,816	75,983	196,833	
Lucky Star Ore	3,077		3,077	
Total Ore	550,000	506,600	43,400	
Rock	18,230	24,760		6,530
Total Hoist	568,230	531,360	36,870	

b. Shipments:

	<u>Pocket</u>	<u>Stockpile</u>		
<u>Grade of Ore</u>	<u>Tons</u>	<u>Tons</u>	<u>Total 1949</u>	<u>Total 1948</u>
Athens Ore	99,850	93,976	193,826	328,407
Mitchell Lease Ore	53,241	32,409	85,650	123,750
Corbit Lease Ore	161,614	120,866	282,480	49,895
Lucky Star Ore	3,077		3,077	
Total	317,782	247,251	565,033	502,052
Total Last Year	312,704	189,348	502,052	
Increase	5,078	57,903	62,981	
Decrease				

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2. PRODUCTION SHIPMENTS
AND INVENTORIES: (Cont'd)

c. Stockpile Inventories:

<u>Grade of Ore</u>	<u>Dec. 31, 1949</u>	<u>Dec. 31, 1948</u>	<u>Increase</u>	<u>Decrease</u>
Athens Ore	24,966	28,842		3,876
Mitchell Lease Ore	6,855	8,348		1,493
Corbit Lease Ore	16,521	26,185		9,664
Total	48,342	63,375		15,033

d. Division of Products by Levels:

	<u>1949</u>		<u>1948</u>	
	<u>Tons</u>	<u>Percent</u>	<u>Tons</u>	<u>Percent</u>
4th Level	306,792	55.78	151,047	29.82
6th Level	167,427	30.44	188,016	37.11
7th Level				
8th Level	13,942	2.53	51,519	10.17
9th Level	52,343	9.52	71,738	14.16
10th Level	9,496	1.73	44,280	8.74
	550,000	100.	506,600	100.

e. Production by Months:

<u>Month</u>	<u>Athens</u>	<u>Mitchell</u>	<u>Corbit</u>	<u>Lucky Star</u>	<u>Total</u>	<u>Rock</u>
January	18,873	7,800	33,374		60,047	1,935
February	19,641	4,857	28,836		53,334	1,590
March	18,026	12,895	32,380		63,301	3,845
April	14,507	11,126	27,232		52,865	1,735
May	16,383	9,708	23,631	2,894	52,616	1,520
June	17,241	8,413	31,046	24	56,724	1,235
July	19,645	4,910	23,423		47,978	765
August	13,929	5,223	22,314		41,466	1,635
September	14,437	8,273	22,744		45,454	1,430
October	296	381	465		1,142	
November	10,254	2,110	6,267		18,631	730
December	19,365	6,165	13,500	159	39,189	1,810
Total 1949	182,597	81,861	265,212	3,077	532,747	18,230
Current Year's						
Stockpile Overrun	7,353	2,296	7,604		17,253	
Total 1949	189,950	84,157	272,816	3,077	550,000	18,230
Total 1948	320,492	110,045	76,063		506,600	24,760
Increase			196,753	3,077	43,400	
Decrease	130,542	25,888				6,530

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2. PRODUCTION SHIPMENTS AND INVENTORIES:
f. Ore Statement:

ORE STATEMENT - DECEMBER 31st 1949

	<u>Athens</u>	<u>Mitchell Lease</u>	<u>Corbit Lease</u>	<u>Lucky Star</u>	<u>1949 Total</u>	<u>1948 Total</u>
On Hand January 1st, 1949	28,842	8,348	26,185	---	63,375	58,827
Out-put for year	182,597	81,861	265,212	3,077	532,747	503,116
Current Year's Overrun	<u>7,353</u>	<u>2,296</u>	<u>7,604</u>	---	<u>17,253</u>	<u>3,484</u>
Total	218,792	92,505	299,001	3,077	613,375	565,427
Shipments	<u>193,826</u>	<u>85,650</u>	<u>282,480</u>	<u>3,077</u>	<u>565,033</u>	<u>502,052</u>
Balance On Hand	24,966	6,855	16,521	---	48,342	63,375
Increase in Output			196,753	3,077	43,400	
Decrease in Output	130,542	25,888				
Decrease in Ore On Hand	3,876	1,493	9,664	---	15,033	

SHIPMENTS FOR YEAR 1949

<u>Grades</u>	<u>Pocket</u>	<u>Stockpile</u>	<u>1949 Total</u>	<u>1948 Total</u>
Athens	99,850	93,976	193,826	328,407
Mitchell Lease	53,241	32,409	85,650	123,750
Corbit Lease	161,614	120,866	282,480	49,895
Lucky Star	3,077	---	3,077	---
Total	<u>317,782</u>	<u>247,251</u>	<u>565,033</u>	<u>502,052</u>
Total Last Year	<u>312,704</u>	<u>189,348</u>	<u>502,052</u>	---
Increase in Shipments	5,078	57,903	62,981	---

g. Delays:

- January 6 - 1 1/4 Hours - Loss of Product, 115 Tons
Shaft Inspection
- January 13 - 1 1/2 Hours - Loss of Product, 135 Tons
Shaft Inspection
- January 14 - 1/3 Hour - Loss of Product, 35 Tons
Power Failure
- January 20 - 1 1/2 Hour - Loss of Product, 150 Tons
Changing Skip Shoes
- February 3 - 1/2 Hour - Loss of Product, 50 Tons
Changing Skip Shoes
- February 8 - 1/3 Hour - Loss of Product, 35 Tons
Repairing Skip
- February 9 - 1 1/2 Hour - Loss of Product, 150 Tons
Shaft Inspection
- February 12 - 6 Hours - Loss of Product, 600 Tons
Skip Rope pulled thru Crosby Clips, Dropping skip
- February 14, 15, 16, - 43 1/4 Hours - Loss of Product, 5925 Tons
Skip Rope pulled thru Crosby Clips, Dropping skip
- February 17 - 3/4 Hour - Loss of Product, 75 Tons
Repairing Measuring pocket
- February 23 - 1 1/2 Hour - Loss of Product, 150 Tons
Shaft Inspection
- March 1 - 1 1/4 Hour - Loss of Product, 125 Tons
Replacing broken steel liner - head sheave

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2. PRODUCTION SHIPMENTS AND INVENTORIES: (Cont'd)

g. Delays: (Cont'd)

March 2 - 3/4 Hour - Loss of Product - 75 Tons
Electrical trouble in shaft house

March 2 - 1 1/2 Hour - Loss of Product - 150 Tons
Shaft Inspection

March 3 - 1 1/2 Hour - Loss of Product - 150 Tons
Top Tram Car fell off trestle

March 3 - 3/4 Hour - Loss of Product - 65 Tons
Repair U. G. Pocket

March 4 - 2 1/2 Hour - Loss of Product - 250 Tons
Chunks jammed in U. G. Pocket & Changing Top Tram Car

March 9 - 2 Hours - Cleaning pump sump
Loss of Product - 200 Tons

March 9 - 1 1/2 Hour - Loss of Product - 150 Tons
Shaft Inspection

March 22 - 1/2 Hour - Loss of Product - 50 Tons
Repairing Skip

March 23 - 1 1/4 Hour - Loss of Product - 115 Tons
Shaft Inspection

March 30 - 2 1/2 Hour - Loss of Product - 250 Tons
Chunks stuck in U. G. pocket

March 31 - 1 3/4 Hour - Loss of Product - 175 Tons
Shaft inspection & changing skip shoes

March 31 - 1 1/4 Hour - Loss of Product - 125 Tons
Loose plate in U. G. Pocket

April 1 - 1 1/4 Hour - Loss of Product - 110 Tons
Repairing Measuring Pocket

April 2 - 7 1/2 Hour - Loss of Product - 750 Tons
Broken runners in skip road

April 13 - 1 1/2 Hour - Loss of Product - 150 Tons
Shaft Inspection

April 16 - 1 Hour - Loss of Product - 100 Tons
Chunks stuck in U. G. Pocket

April 18 - 3/4 Hour - Loss of Product - 70 Tons
Repairing head sheave

April 19 - 1 Hour - Loss of Product - 100 Tons
Repairing skip

May 4 - 1 Hour - Loss of Product - 100 Tons
Shaft Inspection

May 4 - 1/2 Hour - Loss of Product - 50 Tons
No current acc't Electric storm

May 14 - 1 1/2 Hour - Loss of Product - 150 Tons
Ground - skip hoist motor

June 3 - 1 Hour - Loss of Product - 0
Repair skip - (Welding)

June 15 - 3/4 Hour - Loss of Product - 65 Tons
Compressor run hot & caught fire

July 8 - 1 1/2 Hour - Loss of Product - 150 Tons
Changing south skip

July 28 - 2 Hour - Loss of Product - 200 Tons
Electric Storm - No Current

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2. PRODUCTION SHIPMENTS AND INVENTORIES: (Cont'd)

g. Delays: (Cont'd)

September 19 - 8 3/4 Hour - Loss of Product - 800 Tons
New Rope stretched - skip went down to far and jumped road and broke skip runners

October 1 to

November 14th --- Mine idle acc't of Strike

December 1 - 10 1/2 Hours - Loss of Product - 700 Tons

Bearing on skip hoist generator set burnt

December 2 - 16 Hours - Loss of Product - 1800 Tons

Bearing on skip hoist generator set burnt

December 5 - 8 Hours - Loss of Product - 600 Tons

Bearing on skip hoist generator set burnt

December 6 - 12 Hours - Loss of Product - 800 Tons

Bearing on skip hoist generator set burnt

December 7 - 16 Hours - Loss of Product - 1800 Tons

Bearing on skip hoist generator set burnt

December 8 - 4 1/2 Hours - Loss of Product - 450 Tons

Bearing on skip hoist generator set burnt

Total Delay in 1949 - 106 Hours - Loss of Product - 18,245 Tons

3. ANALYSIS:

a. Average Mine Analysis On Output:

Grade	1949				1948			
	Tons	Iron	Phos	Sil	Tons	Iron	Phos	Sil
Athens & Corbit Ore	447,809	58.45	.117	9.32	393,657	58.35	.113	9.03
Mitchell Ore	81,861	58.75	.123	9.25	109,459	58.30	.118	9.75
	529,670	58.50	.118	9.31	503,116	58.34	.114	9.19

b. Average Analysis On Straight Cargoes:

There were no straight cargo shipments in 1949.

c. High Sulphur Ore:

There was no high sulphur ore encountered in the Athens Mine during 1949:

4. ESTIMATE OF ORE RESERVES:

a. Developed Ore:

Assumption: 12.75 Cubic feet equals one ton, 10 per cent for rock and loss in mining Per cent of Bessemer - None

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4. ESTIMATE OF ORE RESERVES: (Cont'd)

a. Developed Ore: (Cont'd)

	<u>Total Athens</u>	<u>Mitchell Lease Lots 8, 9 & 11</u>	<u>Corbit Lease Lot No. 13</u>	<u>Total Tons</u>
4th Level and Above	43,088	7,792	201,607	252,487
4th to 6th Level	369,210	462,811	37,673	869,694
6th to 7th Level	124,686	71,694		196,380
7th to 8th Level	246,937			246,937
8th to 9th Level	406,474			406,474
9th to 10th Level	548,084			548,084
Below 10th Level	<u>413,824</u>			<u>413,824</u>
Total Gross Tons as of September 1, 1949	2,152,303	542,297	239,280	2,933,880
	<u>Athens Lots</u>	<u>Mitchell Lease</u>	<u>Corbit Lease</u>	<u>Total Tons</u>
Total Gross as of October 1, 1949	2,137,866	534,024	216,536	2,888,426
Tonnage Decrease as Proven by Development (10/1/49-12/31/49)	3,167	1,059		4,235
Tonnage Increase as Proven by Development (10/1/49-12/31/49)	<u>28,412</u>			<u>28,412</u>
Total Gross as of December 31, 1949	2,163,102	532,965	216,536	2,912,603
Less Production Oct. 1st December 31, 1949	<u>29,915</u>	<u>8,656</u>	<u>20,232</u>	<u>58,803</u>
Total Gross as of December 31, 1949	2,133,187	524,309	196,304	2,853,800
Less 10% for Mining and Rock	216,310	53,296	21,654	291,260
Net Tons 1949	<u>1,916,877</u>	<u>471,013</u>	<u>174,650</u>	<u>2,562,540</u>
Net Tons 1948	<u>1,676,575</u>	<u>536,266</u>	<u>397,756</u>	<u>2,610,597</u>
Increase	240,302			
Decrease		65,253	223,106	48,057

b. Prospective Ore:

All ore in the mine is considered developed.

c. Estimated Analysis:
Ore Reserves:

Approximate Expected Natural Analysis

Tons	<u>Iron</u>	<u>Phos</u>	<u>Sil</u>	<u>Mang</u>	<u>Alum</u>	<u>Lime</u>	<u>Mag</u>	<u>Sul</u>	<u>Loss</u>	<u>Moist</u>
2,562,540	51.00	.100	8.00	.30	2.75	.40	.76	.010	1.40	13.50
<u>Ore In Stock:</u>										
<u>Average Natural Analysis</u>										
Athens	<u>Iron</u>	<u>Phos</u>	<u>Sil</u>	<u>Mang</u>	<u>Alum</u>	<u>Lime</u>	<u>Mag</u>	<u>Sul</u>	<u>Loss</u>	<u>Moist</u>
24,966	50.36	.109	7.95	.36	2.94	.45	.92	.011	1.54	13.61
Mitchell										
6,855	50.84	.107	7.74	.36	2.94	.45	.92	.011	1.54	13.57
Corbit										
16,521	50.36	.109	7.95	.36	2.94	.45	.92	.011	1.54	13.61

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5. LABOR AND WAGES:

a. Comments:

The average number of statistical employees in 1949 was 338 as compared with 343 in 1948, a decrease of five men. During the year there were 9 men hired and 29 received by transfer from other mines. There were 31 separations in 1949. Separations consisted of 9 who quit for various reasons, 2 discharged, 12 transferred to other mines, 4 retired and 4 died. The supply of labor was plentiful during the year. The morale of the employees at the Athens has improved greatly and is reflected in the increased production during 1949.

The average wages per month including the captain and clerks decreased from \$299.52 in 1948 to \$293.21 in 1949. The decrease was due to the working schedule being reduced to 5 days per week during the last six months of the year which eliminated most of the overtime pay.

b. Comparative Statement of Wages and Product:

	<u>1949</u>	<u>1948</u>	<u>Increase</u>	<u>Decrease</u>
Product	550,000	506,600	43,400	
No. Shifts & Hours	1/8 Hr. 1 2/8 Hr. 245	1/8 Hr. 3 2/8 Hr. 299		2 54
<u>Average No. Men Working:</u>				
Surface	59½	69		9½
Underground	278½	274	4½	
Total	338	343		5
<u>Average Wages Per Day:</u>				
Surface	11.35	11.16	.19	
Underground	12.81	12.19	.62	
Total	12.57	11.98	.59	
<u>Average Wages Per Month: (Based On Mine Payroll Including Captain & Clerks)</u>				
Surface	265.23	278.15		12.92
Underground	299.57	304.90		5.33
Total	293.21	299.52		6.31
<u>Product Per Man Per Day:</u>				
Surface	31.59	24.55	7.04	
Underground	8.16	6.16	2.00	
Total	6.49	4.92	1.57	
<u>Labor Cost Per Ton:</u>				
Surface	.370	.455		.085
Underground	1.568	1.979		.411
Total	1.938	2.434		.496
<u>Average Product Mining:</u>				
Stoping	26.64	22.93	3.71	
Development in Ore	5.46	7.08		1.62
Total	24.03	20.43	3.60	

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5. LABOR AND WAGES: (Cont'd)b. Comparative Statement of Wages and Product: (Cont'd)

<u>Average Wages Per Day:</u>	<u>1949</u>	<u>1948</u>	<u>Increase</u>	<u>Decrease</u>
For Contract Miners	13.33	12.63	.70	
 <u>Total Number of Man Days:</u>				
Surface	17408 3/4	20633		3224 1/4
Underground	67382 1/4	82254 3/4		14872 1/2
Total	84-791	102887 3/4		18096 3/4
 <u>Amount for Labor:</u>				
Surface	165,533.64	230,308.33		64,774.69
Underground	874,192.45	1,002,525.57		1,128,333.12
Total	1,039,726.09	1,232,833.90		193,107.81
 <u>Average Wages Per Month as Per Labor Statement - Less Captain & Clerks:</u>				
Surface	264.96	273.88		8.92
Underground	298.95	304.02		5.07
Total	292.96	298.65		5.69

Proportion of Surface to Underground Man:

1949: 1 to 4.20

6 2/8 Hr. Shift Jan. 1 to June 30.

5 2/8 Hr. Shift July 1 to Dec 31.

1948: 1 to 3.97

6 2/8 Hr. Shifts

c. Operating Schedules - 1949:

<u>Month</u>	<u>Days Mine Worked Per Week</u>	<u>Days Per Month</u>	<u>Days Men Worked Per Week</u>	<u>Avg. Shifts Worked Per Month By Each Man</u>
January	6	26	6	26
February	6	22	6	22
March	6	27	6	27
April	6	26	6	26
May	6	25	6	25
June	6	26	6	26
July	5	20	5	20
August	5	20	5	20
September	5	21	5	21
October	Idle	---	Idle	---
November	5	12	5	12
December	5	21	5	21
Total		<u>246</u>		<u>246</u>
Average For Year Mine Operated				20.5
Average For Year Worked By Each Man				20.5

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6. SURFACE:

a-1 Buildings:

A new addition, 12 feet by 24 feet was added to the Dry Building. It was constructed of concrete block and finished on the inside with high-rib steel lath and plastered and equipped with a toilet and three head shower bath. It was built as a clean clothes change room for the shift bosses and is being very much appreciated. The old quarters which were entirely too small is now being used for their digging clothes.

Five thermoliers, secured from the Negaunee Mine Dry Building, were installed in the shop building to replace the old heating system consisting of a series of steam pipes strung along the outer walls.

The Dry Building continues to settle and crack due to caving and is giving considerable trouble in maintaining steam and water lines.

A small metal clad shed was built in the Shaft House to house electrical transformers and switches.

At the present time every mine building on the property is settling and cracking. The Engine House is the only building that has not developed a crack but is definitely settling and moving.

a-2 Docks, Trestles and Pockets:

The usual wood trestle for stocking was erected between the two steel trestles.

The south steel trestle was cut loose from the headframe and the ends of the steel decking placed on cradles so that if either the headframe or the trestle moved it would not effect the other. At the present time it shows that either the headframe or the trestle has moved about 3 inches since they were cut loose.

Two stringers were replaced on the coal dock as recommended by the railway company.

The railway loading pockets were kept in good repair with the usual replacement of worn plates.

a-3 Stocking Grounds:

After the shipping season ended the stocking grounds were leveled off and wood slabs were placed at intervals to designate where the rock solar is when the pile is being loaded out next year.

b. Stockpiles:

(1) Ore at the Athens Mine was stocked in three piles in 1949, the Athens ore under the North Steel Trestle and the Wood Trestle and the Mitchell ore under the South Steel Trestle. Loading from the stockpile was started on April 4th and completed on September 29th with the exception of two or three thousand tons of wet ore which was stocked during the summer.

(2) Rock:

The rock was stocked under the wood trestle extending southwest from the shaft on caving ground. As it accumulated under the bents it was bulldozed into the cave.

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6. SURFACE: (Cont'd)

c. Cave to Surface:

The most serious problem at the present time is subsidence. The cave proper continues to settle causing a draw and movement of the entire area covered by the surface plant. The draw at one point extends across Ann Street up to the Duluth South Shore Railway's main track. From an accurate survey made last summer it was found that an iron pin just north of the shaft had settled 1 3/4 inches and had moved 7 3/4 inches south and 4 inches west. The collar of the shaft has moved about 8 inches southwesterly. There is no abrupt break in the shaft but is on a gradual bend from about a depth of 600 feet below the collar. An iron pin located about 120 feet east of the engine house shows a settlement of 4 inches and a movement of 14 3/4 inches to the south and 1 3/4 inches east. The ground on the north side of the Engine House has settled about 2 inches and the south side 3 inches. The outcrop north of Ann Street and just south of the Duluth South Shore & Atlantic Railway Company's main track has gone down 2 inches. The thing that most concerns the operating of the Athens Mine is the movement of the Shaft and the Engine House. To date the Engine House is moving as a unit but if this area should start to crack it is probable that it would throw the machinery out of kilter and stop operations. Too great a movement in the shaft would also probably idle the mine.

c. Deep Wells:

No. 1 Deep Well continued operating throughout the year. A daily inspection of the pump was made to keep it properly lubricated and in good operating condition.

d. Breitung Shaft:

Pumping was continued throughout the year from the Breitung Shaft. This pump is visited daily to take care of lubrication and see that it is in good working condition.

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

	<u>1949</u>		<u>1948</u>		<u>1947</u>	
	<u>Gallons</u>	<u>Amount</u>	<u>Gallons</u>	<u>Amount</u>	<u>Gallons</u>	<u>Amount</u>
1st Quarter	8,019,000	564.33	5,671,000	400.00	5,700,00	402.00
2nd Quarter	7,481,000	526.67	4,774,000	337.18	5,559,000	393.13
3rd Quarter	6,787,000	478.09	5,771,000	406.97	6,847,000	482.29
4th Quarter	<u>5,357,000</u>	<u>377.99</u>	<u>6,476,000</u>	<u>456.32</u>	<u>7,545,000</u>	<u>531.15</u>
Total	27,644,000	1,947.08	22,692,000	1,600.47	25,651,000	1,807.57
Product - Tons	550,000		506,600		508,100	
Cost Per Ton	.002824		.00316		.004	

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6. SURFACE: (Cont'd)
f. Ground and Fences:

About 3,250 feet of new substantial fencing constructed with cedar posts at 8 foot intervals and 4 foot netting topped off with two strands of barbed wire. Of this amount about 750 feet was built along the north side of the pocket track as a safety measure to keep children and others residing along the tracks off the property. The remainder of the fencing was along the Bunker Hill property and the south side of the caved area along the Chicago and North Western Right of Way, inclosing the caved area.

7. UNDERGROUND:
a. Shaft Sinking:

There was no shaft sinking in 1949.

b. Development, General Remarks:

The development of Block Caving Area No. 2 above the 4th Level in the Corbit Lease, Lot 13, continued to receive major emphasis during the year. The last 32 finger raises were developed in the southeast quarter of the area which completed development in the first half of Block No. 2. The development of the north half of Block No. 2 was begun with the No. 3 Transfer Drift being extended from the center, runaround drift to the west boundary, and the No. 4 Transfer Drift being extended from the east to the west boundaries of the Corbit Lease. Eight mill raises then extended to the south from the south edge of Transfer Drift No. 3 to the -355' Grizzly Sub-Level where the No. 5 Grizzly Drift was extended across the tops of the mill raises and connected to existing ventilation connections. At this point the entire north half of Block Caving Area No. 2 was suddenly subject to extreme pressures which forced the abandoning of further Block Caving development above the transfer elevation.

The 6600 Crosscut was extended easterly into the Corbit Lease and a new raise is being advanced to the 4th Level from the south edge of this crosscut in preparation for mining below the 4th Level in this area.

In addition the 6800 Crosscut was driven southerly from the main switch through the north, footwall slate into the ore body and on into the south, footwall slate. Two raises are being advanced to the west from the west edge of this crosscut and will make available for mining the ore lying in Mitchell Lots 8 & 9 below the -440' Sub-Level

The development and exploration of the new orebody north of the large diorite dike continued with seven holes being drilled into the formation at the 7th Level elevation and two holes being drilled into the formation at the 8th Level elevation. In addition, the 8800 Crosscut was extended westerly to the 1500' westing and a double compartment raise was extended to the north from this crosscut to the 7th Level where a transfer drift with appropriate mining raises were being developed in preparation for mining in the area.

A new ventilation connection was also completed between the 8th and 7th Levels in the diorite dike.

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7. UNDERGROUND: (Cont'd)

DEVELOPMENT WORK SHEET

Location	Drifting		Raising		Total	
	Ore	Rock	Ore	Rock	Ore	Rock
-260' Sub-Level	0	0	20	0	20	0
-290' Sub-Level	50	0	89	0	139	0
-315' Sub-Level	158	0	180	0	338	0
-330' Sub-Level	166	0	120	0	286	0
-355' Sub-Level	312	101	219	0	531	101
-365' Sub-Level	76	82	0	0	76	82
-385' Sub-Level	372	0	451	0	823	0
-405' Sub-Level	0	38	0	0	0	38
-430' Sub-Level	0	125	0	18	0	143
-500' Sub-Level	0	0	15	51	15	51
6th Level	93	363	38	96	131	459
-645' Sub-Level	169	0	0	0	169	0
7th Level	134	128	176	0	310	128
8th Level	0	468	0	126	0	594
-840' Sub-Level	104	0	75	0	179	0
Total	1,634	1,305	1,383	291	3,017	1,596

b.1 Development In Ore:

-260' Sub-Level:

A mining contract extended a single compartment raise 20 feet above the sub-level in effecting a connection with the Lucky Star Mine Observation Drift on the -230' Sub-Level.

-290' Sub-Level:

Ore development totalling 50 feet of dog drifting and 89 feet of dog raising was effected in the process of undercutting the area over the east half of Grizzly Drift No. 1 in Block No. 2.

-315' Sub-Level:

Development amounting to 158 feet of dog drifting in ore and 180 feet of dog raising in ore was completed in undercutting the area over Grizzly Drift No. 2, Block No. 2, at this elevation. A small fraction of this footage was consumed in developing dog drifts from which long holes might be drilled to aid in overcoming an "arching action" which occurred over Block No. 2 adjacent to the Lucky Star Mine boundary.

-330' Sub-Level:

Ore development totalling 166 feet of dog drifting and 120 feet of dog raising was effected in undercutting the area over Grizzly Drifts No. 3 & 4, Block No. 2, at this elevation.

-355' Sub-Level:

Ore development totalling 312 feet of drifting and 219 feet of raising consisted of the No. 5 Grizzly Drift, Block No. 2, with sixteen cutouts for finger raises and cutouts with appropriate dog raises from this elevation to the undercut elevation over the east one-third of Grizzly Drifts No. 3 & 4, Block No. 2.

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7. UNDERGROUND: (Cont'd)
b.1 Development In Ore: (Cont'd)

-365' Sub-Level:

Seventy-six feet of ore drift was developed at this elevation by a mining contract in completing a connection from which "fringe ore" lying outside the limits of Block No. 2 might be mined.

-385' Sub-Level:

Development in ore amounting to 372 feet of drifting and 451 feet of raising was effected in developing the west half of Transfer Drift No. 3 and the whole of Transfer Drift No. 4, Block No. 2, with appropriate mill raising on both transfer drifts to effect a modified version of block caving in the area over the transfer drifts.

4th Level:

There was no ore development at this elevation during the year.

-500' Sub-Level:

Ore development consisting of 15 feet of double compartment raise was effected in completing Raise No. 667 above this elevation.

6th Level:

Development in ore totalling 93 feet of main level drifting and 38 feet of raising was effected in extending the 6800 Crosscut through the orebody and in advancing Raises No. 683 & 685 westerly from the crosscut.

-645' Sub-Level:

Ore development totalling 169 feet of sub-level drifting was completed at this elevation in preparing the new orebody north of the big diorite dike for mining.

7th Level:

Development in ore consisting of 134 feet of drifting and 176 feet of raising was completed in preparing the new orebody north of the big diorite dike for mining above this elevation.

8th Level:

There was no ore development on the 8th Level during 1949.

-840' Sub-Level:

A transfer drift was extended 104 feet through ore at this elevation and three raises were advanced a total distance of 75 feet above the transfer drift in making the area over the transfer drift available for mining.

9th Level:

There was no ore development on the 9th Level during 1949.

10th Level:

There was no ore development on the 10th Level during 1949.

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7. UNDERGROUND: (Cont'd)
b.2 Development In Rock:

-355' Sub-Level:

Rock development totalling 101 feet was completed in gaining access to the orebody at this elevation from Raises No. 452 and 456.

-365' Sub-Level:

A total of 82 feet of rock drifting was completed in gaining access to the orebody from Raise No. 456 at this elevation.

4th Level:

There was no rock development on the 4th Level during the year.

-405' Sub-Level:

A total of 38 feet of rock drifting was effected in developing a ventilation connection between Raise No. 665 at this elevation and the 4th Level.

-430' Sub-Level:

One hundred and twenty-five feet of rock drift and 18 feet of rock raise was completed in effecting ventilation and travelling connections from Raises No. 661-A and 665 to existing ventilation facilities on the -405' Sub-Level.

-500' Sub-Level:

Rock raising totalling 51 feet was effected in advancing Raise No. 673 above this sub-level in Corbit Lease, Lot 13.

6th Level:

Rock development totalling 363 feet of drifting was completed in extending the 6600 Crosscut easterly into the Corbit Lease, Lot 13, and the 6800 Crosscut southerly in Athens Lot 10. Raise No. 673 was extended 96 feet southerly through footwall slate in the Corbit Lease, Lot 13, between the 6th Level and the -500' Sub-Level.

7th Level:

Rock development consisting of 128 feet of drifting was effected at this elevation in completing a ventilation connection from the top of Raise No. 800 to the 7th Level main drift and in cutting out over Raise No. 880 and extending said cutout northerly to the new orebody north of the big diorite dike.

8th Level:

A total of 126 feet of rock raising was effected in completing Ventilation Raise No. 800 between the 8th Level and the 7th Level and in extending Raise No. 880 from the 8th Level to the 7th Level elevation through diorite dike. The 8800 Crosscut was also extended 468 feet westerly through diorite dike as part of the development of the new orebody north of this dike.

9th Level:

There was no rock development on the 9th Level during the year.

10th Level:

There was no rock development on the 10th Level during the year.

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7. UNDERGROUND: (CONT'D)

c. Stoping:

(1) General:

The production for 1949 was obtained principally from the 4th and 6th Levels where 86.22% of the total annual production was trammed. An additional 9.52% of the annual production was trammed on the 9th Level with the remaining 4.26% being divided approximately equally between the 8th and 10th Levels. The increase in production from the 4th Level of from 29.82% in 1948 to 55.78% in 1949 together with a proportionate drop of 6.67% in production from the 6th Level can be directly attributed to the bringing in to full production of Block Caving Area No. 2 above the 4th Level in Corbit Lease, Lot 13,. The decrease production from the 8th Level of from 10.17% in 1948 to 2.53% in 1949 and the 10th Level from 8.74% in 1948 to 1.73% in 1949 can be attributed to the fact that both Levels were out of production for a major protion of the year.

The production of ore by Block Caving from the south half of Block No. 2 was completed by September 30th and only a small tonnage of additional ore will be recovered from the area by cleanup operations. The north half of this area is being mined by a modified version of Block Caving and, since all "fringe and cut off mining" has been completed, production from the Corbit Lease in 1950 will be largely confined to this area.

Sub-level caving, top slicing and a combination of sub-caving and top slicing was continued throughout the remainder of the mining during 1949. The combination system of sub-caving and slicing was used in areas where the mining system is being converted from sub-level caving to top slicing.

The locations of the mining contracts at the end of 1949 and 1948 are shown below:

	<u>1949</u>		<u>1948</u>
	7 above 4th Level		11 above 4th Level
	12 above 6th Level		7 above 6th Level
	4 above 8th Level		3 above 8th Level
	4 above 9th Level		3 above 9th Level
	0 above 10th Level		2 above 10th Level
Total	<u>27</u>	Total	<u>26</u>

The contracts are divided as follows:

	<u>1949</u>		<u>1948</u>
Mining -	8 top slicing	Mining -	12 top slicing
Mining -	10 sub-caving	Mining -	8 sub-caving
Developing -	5 raising	Developing -	4 raising
Developing -	4 drifting	Developing -	2 drifting
Total	<u>27</u>	Total	<u>26</u>

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7. UNDERGROUND: (Cont'd)

c. Stoping:

(1) General: (Cont'd)

Above the 4th Level, ore was mined from the following sub-levels: -135', -170', -185', -200', -210', -220', -230', -245', -260', -275', -290', -300', -315', -330', -340', -355', -365', -375', -385' and the 4th Level.

Between the 4th and 6th Levels, ore was mined from the -405', -415', -430', -440', -500' Sub-levels and the 6th Level.

Between the 6th and 8th Levels, ore was mined from the following sub-levels: -645', 7th Level, -770', -780' and the 8th Level.

Between the 8th and 10th Levels, ore was mined on the -800', -815', -830', -840', -855' and -975' Sub-levels

Many of the sub-levels mentioned above were not actually occupied by mining contracts, but the ore was extracted from sub-levels underneath.

(2) Detail of Stopping:

Above 4th Level - Mitchell Lots 8, 9 & 11; Athens Lots 10 & 12;
- Corbit Lot 13:

Mining above the 4th Level during the year was largely concentrated in Corbit Lot 13 with a much lesser amount of mining taking place in Athens Lot 12 and Mitchell Lot 11 on the -355' Sub-Level. Mining from Athens Lot 10 and Mitchell Lots 8 & 9 was confined to the removal of isolated pillars and ore lying beneath the hanging jasper in new territories which were sub-level caved by Contracts Nos. 1, 10, 15, and 40 operating on the -405' and -430' Sub-Levels.

Mining in Corbit Lot 13 consisted principally of Block Caving in the south half of Block Area No. 2 which was completed by the end of September of this year, partially of "cut off and fringe" mining by Contracts No. 9, 14, 17 and 32 using the sub-level caving system along the Athens - Lucky Star Mine boundary and between the north footwall and north limits of Block Area No. 2, and partially in the north half of Block Area No. 2 by Contracts No. 3, 6, 7, & 14 and 17 using a modified system of block caving.

In Athens Lot 12, Contracts No. 3 & 4 continued to mine ore lying between the north footwall and old workings by top slicing. Mining on the -355' Sub-level was completed during the year and Contract No. 4 moved down to the -365' Sub-level while Contract No. 3 moved to Corbit Lot 13.

In Mitchell Lot 11, Contract No. 3 completed mining on the -355' sub-level and Contract No. 22 completed mining at 4th Level elevation early in the year. The only other mining in Lot 11 was the removal of isolated pillars by Contracts No. 10, 12 and 22 operating on the -405' Sub-level.

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- 7. UNDERGROUND: (Cont'd)
 - c. Stoping: (Cont'd)
 - (2) Detail of Stoping: (Cont'd)

Between 4th & 6th Levels - Mitchell Lots 8, 9, & 11; Athens Lots 10 & 12:

Mining in this area was confined principally to the -405' and -430' sub-levels in Mitchell Lots 8, 9 & 11 and Athens Lots 10 & 12 by Contracts No. 1, 8, 10, 12, 15, 22, 25, 30 and 40 using a combination of sub-level caving and top slicing.

The -440' Sub-level was cut during the year and a small amount of mining was done by Contracts No. 8 and 30 using the top slicing system.

The only activity noted from the -500' Sub-level during the year was the extension of Raise No. 667 from the sub-level to the -405' Sub-level by Contract No. 10 and the advancing of Raise No. 673 northerly above this sub-level in Corbit Lot 13 by Contract No. 11.

Between 6th & 8th Levels - Ore Area North of the Cross Dike:

Early in the year Contract No. 18 completed mining on the -770' Sub-level in the eastern extremity of the formation . The -780' Sub-level was developed and mining was completed by mid-year when the contract moved down to the -800' Sub-level. Ore at the 8th Level elevation was removed by mining from the -800' Sub-level. The mining method used in this area was top-slicing.

Between 8th & 9th Levels - North of the Cross Dike:

Mining on the -800' Sub-level in the eastern extremity of the ore body was 95% completed by Contracts No. 18 & 27, the only ore remaining in place being a small pillar directly below the old 8600 Crosscut which was unavailable for mining because of a low back. The -815' Sub-level was developed in this area by two mining contracts and the extraction of ore from the pillar had been 70% by the end of the year.

Contracts No. 2 & 19 completed mining on the -815' Sub-level in the center portion of the orebody early in the year. The -830' Sub-Level was then developed and mining in the west half of the sector was compl ed by Contract No. 2. After mining approximately 80% of the east half of the sector a fire in the old gob was encountered by Contract No. 19 and the sub-level had to be abandoned. The -855' Sub-level was then developed by Contract No. 19 and mining in the area resumed with a 12 foot floor pillar being left between the fire above and the new sub-level. All mining in the area between 8th and 9th Levels was by top slicing.

Between 9th & 10th Levels - Block No. 2:

Mining on the -975' Sub-Level was completed early in the year by Contracts No. 24 & 26 using a combination system of sub-caving and top slicing. This completed mining between the 9th and 10th Levels in this area and the contracts were moved to the Corbit Lease above 4th Level to assist in developing Block Caving Area No. 2 for mining.

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

The total cost of timbering decreased \$94,149.46 under last year. This decrease may best be explained by the statement that while timber and freight costs remained about the same with only framing and handling costs increasing incident to increased labor costs, the increased use of the Block Caving system of mining and the decreased maintenance costs on main levels were sufficient to effect the saving indicated.

The use of 4 inch "H" section steel, 8 inch "I" section steel and double 8 inch "I" section welded steel continued with steel sets replacing timber sets in all main level rock drifting, main air ways where timber is subject to rapid deterioration and in main level ore drifts where extreme back and side pressures are encountered.

Statement of Timber Used:

	<u>Lineal Feet</u>	<u>Per Foot Avg. Price</u>	<u>1949 Amount</u>	<u>1948 Amount</u>
6" to 8" Cribbing	65,224	.0850	5,543.19	12,163.60
8" to 10" Stulls	11,251	.1373	1,545.29	4,340.74
10" to 12" Stulls	63,879	.2034	12,993.87	13,914.70
12" to 14" Stulls	27,259	.3233	8,812.71	7,992.40
14" to 16" Stulls	17,127	.4316	7,392.79	2,179.43
Special Sawed Tbr. Blk. Cave	17,044	.4480	7,635.38	3,507.43
Total 1949	201,784	.1387	43,923.23	
Total 1948	300,252	.1469		44,098.30
		<u>Per 100'</u>		
7' Lagging	814,712	1.6121	13,133.69	16,896.46
9½' Poles	373,296	3.1125	11,618.77	18,185.35
Total 1949	1,188,008	2.0835	24,752.46	
Total 1948	1,674,592	2.0949		35,081.81
Wire Netting	990		98.64	63.12
PRODUCT FOR YEAR - TONS			550,000	506,600
Ft. Timber Per Ton of Ore			.3669	.5927
Ft. Lagging Per Ton of Ore			1.4813	2.0835
Ft. Poles Per Ton of Ore			.6787	1.2220
Ft. Lagging Per Ft. Of Timber			4.0375	3.5154
Cost Per Ton For Timber			.0799	.0792
Cost Per Ton For Lagging			.0239	.0333
Cost per ton For Poles			.0211	.0359
Cost Per Ton For Wire Netting			.0002	.0001
Cost Per Ton For Timber, Lagging, Poles & Netting			.1250	.1485
Equivalent of Stull Timber To Board Measure			589,632	460,039
Ft. Of Board Measure Per Ton Of Ore			1.0721	.9081
Lin. Ft. Of Netting Per Ton Of Ore			.0018	.0019
Sq. Ft. Of Netting Per Ton Of Ore			.0075	.0081

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

	<u>Amount</u>	<u>Cost Per Ton</u>
Total Cost of Tbr. Lagging, Poles, Etc. For Years 1949	68,774.33	.1250
1948	75,243.23	.1485
1947	78,082.59	.1537
1946	53,734.65	.1463
1945	72,844.22	.1661
1944	77,935.27	.1850
1943	82,305.17	.1589
1942	82,410.65	.1209
1941	67,589.93	.1041
1940	59,589.66	.1155
1939	47,153.55	.1164

e. Drifting And Raising:

The following table gives a comparison of total feet of drifting and raising in ore and rock in 1949 and 1948:

<u>Year</u>	<u>Drifting</u>		<u>Raising</u>		<u>Grand Total</u>
	<u>Ore</u>	<u>Rock</u>	<u>Ore</u>	<u>Rock</u>	
1949	1634	1305	1383	291	4613
1948	2885	1528	2221	628	7262
Increase					
Decrease	1251	223	838	337	2649

f. Explosives, Drilling And Blasting:Statement of Explosives Used: (Ore Development And Stopping)

	<u>QUANTITY</u>	<u>AVERAGE PRICE</u>	<u>AMOUNT 1949</u>	<u>AMOUNT 1948</u>
60% Hi. Pres. Gelatin	30,400	20.00	6,080.00	810.00
No. 2x Hercomite Powder Lbs.	93,300	14.50	13,528.50	9,403.75
No. 1x Gelamite Powder Lbs.	52,908	15.25	8,068.51	14,090.21
Total Powder	176,608	15.67	27,677.01	24,303.96
Fuse - Feet	503,040	8.41	4,229.40	4,871.12
Caps	63,870	14.70	938.90	1,082.50
Electric Cap & Delays	1,095	19.19	210.16	372.81
Prima Cord	181,500	32.00	5,808.00	672.00
Galvanometer				17.25
Master Lighters	500	9.00	4.50	3.38
Fuse Lighters	17,500	9.00	157.50	152.35
Connecting Wire, Lbs.	18	.80	14.40	64.00
Shot Firing Cord - Feet	1,240	18.96	23.15	9.33
Total Fuse, Caps, Etc.			11,386.37	7,244.74
Total Cost All Explosives			39,063.38	31,548.70
Product			550,000	506.600
Pounds Powder Per Ton Of Ore			.3211	.3289
Tons Of Ore Per Lb Of Powder			3.1142	3.0402
Cost Per Ton For Powder			.0503	.0480
Cost Per Ton For Fuse, Caps, Etc.			.0207	.0143
Cost Per Ton For All Explosives			.0710	.0623

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7. UNDERGROUND: (Cont'd)f. Explosives, Drilling and Blasting: (Cont'd)Statement of Explosives Used: (Sinking, Rock Development, Etc.)

	<u>QUANTITY</u>	<u>AVERAGE PRICE</u>	<u>AMOUNT 1949</u>	<u>AMOUNT 1948</u>
No. 1x Gelamite Powder Lbs.	6760	15.25	1,030.90	1,717.80
Total Powder 1949	6760	15.25	1,030.90	
Total Powder 1948	11958	14.37		1,717.80
Fuse-Feet	28,920	8.41	243.15	497.96
Caps	4,830	14.70	71.00	112.82
Electric Caps & Delays	648	18.78	121.70	87.12
Tamptite Paper Shells	890	7.07	6.29	—
Shot Firing Cord - Feet	740	23.93	17.71	9.33
Total Fuse, Caps, Etc.			459.85	707.23
Total All Explosives			1,490.75	2,425.03
Total Explosives Used At Mine			40,554.13	33,973.73
Average Price Per Pound For Powder			.1566	.1457

i. Pumping:

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

<u>Period</u>	<u>Avg. KW Per Day - Athens</u>	<u>KW Per Month Breiting Pump</u>	<u>Avg. Gal. Per Min. - Athens</u>	<u>Total Cost Both Mines From The Athens Cost Sheet</u>
January	3563	900	294	2837.29
February	3516	550	291	2542.47
March	3573	500	296	2694.08
April	3943	2780	299	3113.34
May	3587	4530	324	3703.95
June	4097	4090	336	2881.64
July	4163	4210	337	3340.91
August	4319	4760	356	3806.16
September	4758	5580	396	4270.90
October	4122	4260	373	2189.24
November	4420	3400	361	1433.23
December	4287	2000	350	3574.71
1939 Avg.	3991	4391	331	2291.90
1940 Avg.	4141	858	351	2381.69
1941 Avg.	4008	1883	354	2351.56
1942 Avg.	4435	2258	388	2668.91
1943 Avg.	4351	3358	372	2701.08
1944 Avg.	3696	1688	308	2528.62
1945 Avg.	3951	2853	332	2356.83
1946 Avg.	3909	1839	320	2456.08
1947 Avg.	3958	3665	340	2599.82
1948 Avg.	3823	1887	320	2834.89
1949 Avg.	4029	3130	334	3032.33

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

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

Month	1949	1948	1947	1946	1945	1944	1943	1942	1941
January	294	331	297	303	306	315	359	399	330
February	291	329	290	331	302	297	334	388	327
March	296	307	287	282	293	296	330	373	324
April	299	307	292	327	342	295	356	374	334
May	324	327	363	366	365	307	404	402	334
June	336	329	385	330	359	312	411	402	367
July	337	323	376	321	359	314	431	393	386
August	356	331	374	314	355	313	429	394	363
September	396	323	368	316	338	311	390	384	363
October	373	321	357	316	329	312	364	397	360
November	361	310	346	304	325	316	337	379	365
December	350	307	346	302	307	308	328	368	397
Average	334	320	340	320	332	308	372	388	354

8. COST OF OPERATING:

a. Comparative Mining Costs:

	1949	1948	Increase	Decrease
Product	550,000	506,600	43,400	
Underground Costs	2.181	2.692		.511
Surface Costs	.280	.316		.036
General Mine Expense	.420	.448		.028
Cost Of Production	2.881	3.456		.575
No. Of Days Operated	246	302		56
No. Shifts & Hours	1 1/8 Hr. 245 2/8 Hr.	3 1/8 Hr. 299 2/8 Hr.		2 1/8 Hr. 54 2/8 Hr.
Average Daily Product	2245	2160	85	

<u>COST OF PRODUCTION:</u>	1949	Percent	1948	Percent	Increase	Decrease
Labor	2.014	69.9	2.512	72.7		.498 .028
Supplies	.867	30.1	.944	27.3	---.028	.077 ---
Total	2.881	100.	3.456	100.		.575

b. Detailed Cost Comparison:

(1) Days And Shifts:

Year	Days Mine Worked	Shifts & Hours	Men Employed	Total Shifts Worked
1949	246	6 2/8 Hr to 7-1-49	346	491
1948	302	5 2/8 Hr to 1-1-50	343	601
Increase	56		3	
Decrease	56			110

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8. COST OF OPERATING: (Cont'd)

b. Detailed Cost Comparison: (Cont'd)

(2) Comparison of Production:

Production - 1949	550,000 Tons
Production - 1948	<u>506,600 Tons</u>
Increase	43,400 Tons

(3) Comparison Of Number Of Men And Wages:

	<u>No. Men</u>	<u>No. Days</u>	<u>Amount</u>	<u>Rate Per Day</u>
1949	346	84,791	1,065,878.07	12.57
1948	343	102,887 3/4	1,232,833.90	11.98
Increase	3			.59
Decrease		18,096 3/4	166,955.83	

(4) Tons Per Man Per Day:

	<u>1949</u>	<u>1948</u>	<u>Increase</u>	<u>Decrease</u>
Surface	31.59	24.55	7.04	
Underground	8.16	6.16	2.00	
Total	6.49	5.04	1.45	

(5) Cost Of Production:

	<u>Total</u>	<u>Cost Per Ton</u>
1949	1,584,673.90	2.881
1948	<u>1,750,725.02</u>	<u>3.456</u>
Decrease	166,051.12	.575

	<u>Labor</u>	<u>Percent</u>	<u>Supplies</u>	<u>Percent</u>
1949	1,007,716.15	69.9	476,957.75	30.1
1948	<u>1,272,485.48</u>	<u>72.7</u>	<u>478,239.54</u>	<u>27.3</u>
Increase				2.8
Decrease	264,769.33	2.8	1,281.79	

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

	<u>COST OF PRODUCTION</u>		<u>1949</u>		<u>1948</u>	
	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>
<u>UNDERGROUND COSTS:</u>						
1 Exploring in Mine	1073.72	.002	7689.10	.015		
2 Development in Rock	22631.07	.041	36157.30	.071		
3 Development in Ore	46201.83	.084	62242.20	.122		
4 Stopping	343367.74	.624	335706.30	.663		
5 Timbering	397539.50	.723	491682.96	.971		
6 Tramming	131059.02	.238	155018.16	.306		
7 Ventilation	21749.80	.040	18669.53	.037		
8 Pumping	35103.70	.064	34018.67	.067		
9 Compressors and Air Pipes	53882.04	.098	61046.34	.121		
10 Back Filling						
11 Underground Superintendence	48424.14	.088	47498.54	.094		
12 Cave-in, or Fire in Mine	317.14	.000	66.28	.000		
13 Maint: Compressors and Power Drills	5488.49	.010	12256.97	.024		
14 Scrapers and Mechanical Loaders	45739.08	.083	55093.77	.109		
15 Tramming Equipment	40428.86	.074	39905.47	.079		
16 Pumping Machinery	6721.72	.012	6543.54	.013		
Total Underground Costs	<u>1199727.85</u>	<u>2.181</u>	<u>1363595.04</u>	<u>2.692</u>		
<u>SURFACE COSTS:</u>						
17 Hoisting	51639.10	.094	52107.47	.103		
18 Stocking Ore	15034.17	.027	14220.77	.028		
19 Dry House	14780.19	.027	17224.52	.034		
20 General Surface Expense	15155.92	.028	17942.13	.035		
21 Maint: Hoisting Equipment	26223.08	.048	17394.64	.034		
22 Shaft	11411.81	.021	10808.69	.021		
23 Top Tram Equipment	9947.46	.018	3083.22	.006		
24 Dock, Trestles and Pockets	6585.20	.012	24267.23	.048		
25 Mine Buildings	3463.54	.005	3394.62	.007		
Total Surface Costs	<u>154240.47</u>	<u>.280</u>	<u>160443.29</u>	<u>.316</u>		
<u>GENERAL MINE EXPENSES:</u>						
26 Geological	1551.50	.003	951.48	.002		
27 Mining Engineering	10613.39	.019	9079.75	.018		
28 Mechanical and Electrical Engineering	3653.64	.007	3094.21	.006		
29 Analysis and Grading	23133.68	.042	20754.10	.041		
30 Safety Department	4004.36	.007	4119.41	.008		
31 Telephone and Safety Devices	6219.18	.011	6355.40	.013		
32 Local and General Welfare	4106.03	.007	4884.89	.010		
33 Special Expense, Pensions and Allowances	9752.90	.018	8943.49	.018		
34 Ishpeming Office	24548.18	.045	31644.66	.062		
35 Mine Office	27810.07	.051	31884.67	.063		
36 Insurance	23300.97	.042	19034.87	.038		
37 Personal Injury	27483.61	.050	17969.41	.035		
38 Social Security Taxes	23299.17	.042	24540.07	.048		
39 Employees Vacation Pay	41228.90	.076	43430.28	.086		
Total General Mine Expenses	<u>230705.58</u>	<u>.420</u>	<u>226686.69</u>	<u>.448</u>		
COST OF PRODUCTION	1584673.90	2.881	1750725.02	3.456		
PRODUCT	550,000 Tons		506,600 Tons			

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8. COST OF OPERATING: (Cont'd)

b. Detailed Cost Comparison: (Cont'd)

(7) Detail of Accounts:

1. Exploring in Mine:

The expense in 1949 was all Geological Department expense while in 1948 there were 2,001 feet of drilling with bortz bits. The decrease in cost for 1949 was \$6,615.38 and cost per ton \$.013.

2. Development in Rock:

Decrease in expense \$13,526.23 and cost per ton \$.030. The total feet drifting and raising in rock, 996 feet in 1949 as compared with 2,156 feet in 1948. Drifting in 1949, 796 feet; in 1948, 1,528 feet. Raising in 1949, 200 feet; in 1948, 628 feet.

3. Development in Ore:

The decrease in expense was \$16,040.37 and cost per ton \$.038. There were 1,251 feet less drifting and 915 feet less raising in 1949. The decrease in expense and footage was due to development of Block No. 2 in 1948.

4. Stoping:

There was an increase in expense of \$7,661.44 and cost per ton decreased \$.039. Increase in expense due to larger product.

5. Timbering:

The decrease in expense was \$94,143.46 and cost per ton \$.248. There were no new timber hoists bought in 1949. In 1948 four H. U. single drum and one double drum hoists costing \$3,366.00 and two electric power chain saws for framing timber, costing \$971.00 were purchased. There was also an increase in the amount of steel beams used in place of timber for sets.

6. Tramming:

There was an increase of 43,400 tons in production. The expense to this account decreased \$23,959.14 and cost per ton decreased \$.068. Decrease due to less expense cleaning skip pit and main level tracks.

7. Ventilation:

The expense to this account increased \$3,080.27 and cost per ton \$.003. The charge for electric power was \$666.32 more in 1949. In 1949 two Midget Blowers costing \$540.00 were bought as compared with none in 1948 and one of the ventilation raises was concreted in 1949.

8. Pumping:

Expense increased \$1,085.03 and cost per ton increased \$.003

Gallons of water pumped in 1949 - 176,437,598

Gallons of water pumped in 1948 - 169,128,796

Gallons increased 7,308,802

Average gallons per minute in 1949 - 334

Average gallons per minute in 1948 - 320

Increase Gallons Per Minute 14

The cost for electric power was \$3,018.74 More than in 1948.

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

- 9. Compressors and Air Pipes:
Expenditures Decreased \$7,164.30 and cost per ton decreased \$.033.
Cubic Feet Air Compressed in 1949 = 992,700,000
Cubic Feet Air Compressed in 1948 = 1,184,040,000
Decrease 291,340,000

- Cost of electric power in 1949 = \$32,634.08
Cost of electric power in 1948 = \$36,558.60
Decrease \$ 3,924.52

- 10. Back Filling:
There was no expense to this account in 1949.

- 11. Underground Superintendent:
The increase in expense was \$ 925.60 and cost per ton decreased \$.006.

- 12. Cave-in and Fire in Mine:
The expense to this account increased \$250.86 and cost per ton remained the same. The increase in expense was due to fencing cave.

- 13. Compressors and Power Drills:
There was a decrease in expense of \$6,768.48 and cost per ton \$.014. In 1949 the following drill machines and equipment were purchased: six R B 12-Ing. R. Jackhammers costing \$1,710.00; four L 29-Ing. R. Pickhammers \$620.00; one Le Roi H C 23 Rock Drill with column \$825.00; one S-91 Joy Mfg. Co. Stoper \$ 565.00; and four Ing. Rand. Jacklegs \$634.00. In 1948 there were 14 drill machines and one LeRoi Triple Jumbo bought costing \$8,777.00

- 14. Scrapers and Mechanical Loaders:
The decrease in expense was \$9,354.69 and cost per ton \$.026. In 1949 there were two 20- H.P. and one 25 H.P. Ingersoll-Rand electric scraper hoists purchased second hand costing \$1,305.00 and nine new Holcomb scrapers costing \$2,415.13. In 1948 one 40 H.P. Sullivan electric scraper hoist costing \$3,933.00 and twenty three Holcomb scrapers for \$5,393.81.

- 15. Electric Tram Equipment:
The increase in expense was \$523.39 and cost per ton decreased \$.005.

Detail:

	<u>Generators</u>	<u>Locomotives</u>	<u>Wiring</u>	<u>M.L. Track</u>	<u>M.L. Cars</u>
1949	279.01	8491.34	2454.99	17894.70	11308.82
1948	445.97	10173.92	1882.60	20982.72	6420.26
Increase			572.39		4888.56
Decrease	166.96	1628.58		3088.02	

Decrease in expense to Generators and Locomotives due to less repairs. Increase to Wiring due to extending trolley lines and more repairs. Decrease in expense to Main Lines tracks due to less extensions. The increase to Main Line Cars due to the purchase of 16 Rocker Dump Cars, second hand from Negaunee Mine costing \$2,100.00 and over hauling them.

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

16. Pumping Machinery:
Expenditures increased \$178.18 and cost per ton decreased \$.001.
The increase was due to more repairs to electric pumps.

SURFACE COSTS:

17. <u>Hoisting:</u>		<u>Ore</u>	<u>Rock</u>	<u>Total</u>
Product 1949 - Tons		550,000	18,230	568,230
Product 1948 - Tons		506,600	24,760	531,360
Increase		43,400		36,870
Decrease			6,530	

There was a decrease of \$468.37 and cost per ton \$.009. The electric power charge was \$808.84 more than in 1948. The product was 43,400 tons more in 1949.

18. <u>Stocking Ore:</u>	
Tons Stocked in 1949—	214,965
Tons Stocked in 1948—	190,413
Increase	24,552

The increase in expense was \$813.40 and cost per ton decreased \$.001; 214,965 tons were stocked in 1949 as compared with 190,413 tons in 1948.

19. Dry House Expense:
The expense to this account decreased \$2,444.33 and cost per ton \$.007.

20. General Surface Expense:
Expense to this account decreased \$2,786.21 and cost per ton \$.007.

21. Hoisting Equipment:

	<u>Electric</u>	<u>Hoisting</u>	<u>Skip and</u>	
	<u>Hoists</u>	<u>Ropes</u>	<u>Skip Roads</u>	<u>Sheaves</u>
1949	5,576.54	7,402.98	12,082.93	1,160.63
1948	3,585.96	-----	13,381.81	426.87
Increase	1,990.58	7,402.98		733.76
Decrease			1,298.88	

The increase in expense was \$8,828.44 and cost per ton \$.014. Increase in expense to Electric Hoists due to replacing brake anchors on skip hoist. There were two 1 3/8" skip ropes and one 1 1/4" cage rope replaced in 1949 as compared with no ropes charged in 1948. Decrease to skips and skip roads due to less repairs. Increase to sheaves due to more replacements of pulley stand sheaves and liners on head frame sheaves.

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

22. Shaft:

There was an increase in expense of \$603.12 and cost per ton \$.000

	<u>Steel Sets</u>	<u>Underground Pockets</u>
1949	2,423.77	8,988.04
1948	2,970.02	7,838.67
Increase		1,149.37
Decrease	546.25	

23. Top Tram Equipment:

There was an increase in expense of \$6,864.24 and cost per ton \$.012.

	<u>Engines & Motors</u>	<u>Wire Rope</u>	<u>Sheaves Rollers, Etc.</u>	<u>Track & Cars</u>
1949	947.85	286.58	742.84	7,970.19
1948	289.85	355.00	1,447.65	990.72
Increase	658.00			6,979.47
Decrease		68.42	704.81	

Increase in expense to Engines and Motors due to over hauling motors.
Increase to Tracks and Cars due to building two new steel saddle back cars at General Shops.

24. Docks, Trestles, and Pockets:

The decrease in expenditures was \$17,682.03 and cost per ton \$.036.
Increase due to building wood stocking trestle and repairing skip dump.

25. Mine Buildings:

Expenditures increased \$68.92 and cost per ton decreased \$.002.

The detail of expense is as follows:

Office -	\$ 46.08	Repairing, Alterations and Painting.
Warehouse -	-----	
Shops -	359.33	Repairing roof.
Shaft House -	25.71	Repairing frame work.
Engine House -	328.46	Repairing windows and painting.
Heating Plant Bldg. -	30.10	Repairing roof and windows.
Dry House -	2,296.63	Building addition to shift bosses changing room.
Coal Dock -	70.88	Replacing rotted timber.
Timber Tunnel -	27.81	Repairing doors and covering.
Top Tram Bldg. -	78.59	Building cover for cables and transformers.
Storage -	199.95	Alterations for truck garage.
Misc. Bldgs. -	-----	
Total	\$3,463.54	

GENERAL MINE EXPENSE:

26. Geological:

The increase in expense was \$600.02 and cost per ton \$.001.

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YEAR 1949

8. COST OF OPERATING: (Cont'd)

b. Detailed Cost Comparison: (Cont'd)

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

27. Mining Engineering:

The increase in expense was \$1,533.64 and cost per ton \$.001.
Covers time and expense of engineers and helpers.

28. Mechanical and Electrical Engineering:

There was an increase in expense of \$559.43 and cost per ton \$.001.
The charge to this account covers the time spent by mechanical and electrical departments on inspection and repairs.

29. Analysis and Grading:

	<u>Sampling At Mine</u>	<u>Central Laboratory Exp.</u>	<u>Shipping Dept. Exp.</u>	<u>Trucking Samples, Etc.</u>
1949	4,174.85	13,824.74	3,778.35	1,355.74
1948	4,708.73	11,176.99	3,595.69	1,272.69
Increase		2,647.75	182.66	83.05
Decrease	533.88			

Determinations 1949 - 70,309; Cost per determination \$.2212311

Determinations 1948 - 55,795; Cost per determination \$.203384

There was an increase in expenditures of \$2,379.58 and cost per ton \$.001.

30. Safety Department:

	<u>First Aid Safety Supplies</u>	<u>Safety Goggles Hats, Resporators</u>	<u>First Aid Helmet Practice</u>
1949	182.14	604.50	36.20
1948	109.89	606.05	347.47
Increase	72.25		
Decrease		1.55	311.27
	<u>First Aid Room</u>	<u>Ishpeming Office Charge</u>	
1949	-----	3,181.52	
1948	83.86	2,972.14	
Increase		209.38	
Decrease	83.86		

The expense to this account decreased \$115.05 and cost per ton \$.001.

31. Telephone and Safety Devices:

	<u>1949</u>	<u>1948</u>	<u>Increase</u>	<u>Decrease</u>
Lights at Shaft & Levels	2,012.79	2,131.27		118.48
Mine Telephone	362.69	432.72		70.03
Safety Gates	798.05	480.64	317.41	
Sign Boards & Signals	1,386.46	1,191.82	194.64	
Fire Equip. & Fire Patrol	1,659.19	2,118.95		459.76
Total	6,219.18	6,355.40		136.22

Cost per ton Decreased \$.002

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8. COST OF OPERATING: (Cont'd)

b. Detailed Cost Comparison: (Cont'd)

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

32. Local and General Welfare:

The expense to this account decreased \$778.86 and cost per ton \$.003.

33. Special Expense, Pensions and Allowances:

	<u>Legal</u>	<u>Examination</u>	<u>Retirement</u>	<u>Other Expense</u>	<u>Pensions & Allowances</u>	<u>Employment Office</u>
1949	490.00	390.00	7,360.66	---	389.08	1,123.16
1948	548.34	560.00	6,289.65	431.01	509.03	605.46
Increase			1,071.01			517.70
Decrease	58.34	170.00		431.01	119.95	

There was an increase in expenditures of \$809.41 and cost per ton remained the same.

34. Ishpeming Office:

Ishpeming Office expense is pro-rated to the various mines on the basis of labor costs. There was a decrease in expense of \$7,096.48 and cost per ton \$.017.

35. Mine Office:

	<u>Salaries</u>	<u>Central Warehouse Expense</u>	<u>Miscellaneous</u>
1949	18,245.93	7,947.51	1,616.63
1948	22,905.88	7,429.97	1,548.82
Increase		517.54	67.81
Decrease	4,659.95		

There was a decrease in expense of \$4,074.60 and cost per ton \$.012.

36. Insurance:

	<u>Property</u>	<u>Group</u>	<u>Catastrophe</u>	<u>Group Annuity</u>
1949	1,643.64	13,037.17	490.09	8,130.07
1948	1,451.58	14,771.21	1,020.81	1,791.27
Increase	192.06			6,338.80
Decrease		1,734.04	530.72	

There was an increase in expense of \$4,266.10 and cost per ton \$.004.

ATHENS MINE
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YEAR 1949

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

37. Personal Injury:

	<u>Compensation and Doctors</u>	<u>Compensation Department</u>	<u>Hospital Loss</u>
1949	16,991.31	1,348.09	9,144.21
1948	4,445.84	1,368.69	12,154.88
Increase	12,545.47		
Decrease		20.60	3,010.67

There was an increase to this account of \$9,514.20 and cost per ton \$.015.

38. Social Security Taxes:

	<u>Unemployment Insurance Tax</u>	<u>Old Age Benefit Tax</u>
1949	13,045.74	10,253.43
1948	13,870.80	10,669.27
Increase	-----	-----
Decrease	825.06	415.84

There was a decrease in expense of \$1,240.90 and cost per ton \$.006

39. Employees Vacation Pay:

The decrease in expense was \$2,201.38 and cost per ton \$010.

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10. TAXES:

COMPARATIVE STATEMENT OF TAXES FOR THE YEARS 1949 AND 1948

<u>DESCRIPTION</u>	<u>1 9 4 9</u>		<u>1 9 4 8</u>	
	<u>VALUATION</u>	<u>TAXES</u>	<u>VALUATION</u>	<u>TAXES</u>
<u>ATHENS MINE</u>				
Including Stockpiles, Supplies and Equipment as placed by the State Tax Commission				
Real Estate	1,145,000	59,957.12	1,450,000	64,257.19
Personal Property	845,000	44,247.83	600,000	26,589.18
Collection Fee		1,042.05		908.46
	<u>1,990,000</u>	<u>105,247.00</u>	<u>2,050,000</u>	<u>91,754.83</u>
<u>HARVEY ADDITION</u>				
Proportion of Lots:				
1	400	20.95	950	42.10
2	200	10.47	190	8.42
3 Fontaine Pur. Liber 23-3	300	15.71	600	26.39
2 Gayette Pur. Liber 24-609	2,800	146.62	950	42.10
5 & 6 .33A Cederblade	1,100	57.60	760	33.68
6 .36A	1,750	91.64	855	37.89
7 Lehman, Liber 20-62	1,250	65.46	475	21.05
7 Liber 28-81	1,600	83.78	475	21.05
7 Liber 30-213	700	36.66	665	29.47
8 Blair, Liber 19-72		House Dismantled		
<u>BOYER LOTS</u>				
Boyer Lot 5, Hendrickson Purchase	1,850	96.87		
" 7, Royea "	285	14.92		
" 8, DeMarzi "	2,550	133.53		
" 9, Lahti "	380	19.90		
<u>STERLING ADDITION</u>				
Lot 1, W 13' Lot 2 & W 6 1/2' Lot 3	1,850	96.87	190	8.42
Lot 7, Vassanen	2,850	149.24	1,330	58.94
Lots 8 & 9, Bjornberg	1,600	83.78	1,140	50.52
Lot 10 Delarye	1,450	75.93	855	37.89
Lot 11 Two Houses	2,950	154.47	1,140	50.52
Lots 12 & 13	3,450	180.66	2,185	96.83
Lot 14 Wick	1,750	91.64	1,045	46.31
Lot 15 Johnson	1,600	83.78	1,425	63.15
Lots 16 & 17 Roma	1,700	89.02	1,520	67.36
Lot 18 C.C.I. Co.	1,750	91.64	1,140	50.52
Lot 19 Turpinen	2,150	112.58	855	37.89
Lot 20 Savola	1,250	65.46	475	21.05
Lot 22 Pachte	1,600	83.78	475	21.05
Lots 23 & 24 C.C.I. Co.	1,800	94.28	1,425	63.15
Lot 25 Farmland	1,600	83.78	855	37.89
Lot 26 C.C.I. Co.	1,550	81.16	855	37.89
Lot 27 Maki	1,500	78.55	855	37.89
Lot 28 C.C.I. Co.	1,700	89.02	1,330	58.94
Lot 29 Mattson	1,750	91.64	1,710	75.78
Lot 30 Rund	1,850	96.87	1,330	58.94
Lots 31 to 38 Inc. C.C.I. Co.	5,450	285.38	4,370	193.66
Lot 72 Lehman	100	5.24	100	4.43
Lots 73, 74, 75	300	15.71	290	12.83
Collection Fee		30.74		14.54
Total Rented Buildings	<u>58,715</u>	<u>3,105.31</u>	<u>32,815</u>	<u>1,468.76</u>
Total Athens Iron Mining Company	<u>2,048,715</u>	<u>108,352.31</u>	<u>2,082,815</u>	<u>93,223.59</u>
<u>DISPOSITION OF CHARGES</u>			Mine	Mine Rented
Total As Above			Operating	Buildings
Charged 11 Months			91,754.83	1,468.76
Balance December Month			84,300.00	1,342.00
			<u>7,454.83</u>	<u>126.76</u>

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11. ACCIDENTS AND PERSONAL INJURY:

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

	1949	1948	1947	1946	1945	1944	1943	1942	1941
Fatal	0	0	0	0	0	0	0	0	0
Time Lost—Over 4 Mos.	2	1	3	1	0	2	4	2	1
1 to 4 Mos.	5	5	6	2	7	7	4	9	7
Less than 1 Mo.	8	7	16	8	7	12	18	5	10
Total Compensable Accidents	15	13	25	11	14	21	26	16	18

Number of cases paid compensation for accidents prior to Jan 1st each year.

1949	1948	1947	1946	1945	1944	1943	1942	1941
4	4	2	1	4	4	4	4	4

Number of cases paid difference in wages.
(Included in above Total)

1949	1948	1947	1946	1945	1944	1943	1942	1941
1	1	2	0	2	2	1	2	2

Nature and Classification of Compensable Accidents:

On December 31, 1949 payments were being made on four accidents which occurred prior to January 1, 1949. One receives partial compensation and three are occupational disease cases.

Acc. No.	Date of Accident	Name	Injury	Days Lost
526	1-14-49	Walter V. Wakkuri	Removed cartilage left knee	Home
527	2-15-49	Tony Arrieri	Fractured 2 bones left hand	37
528	2-1-49	Celio Di Bernardo	Sprained lower back	10
529	2-27-49	Joseph Picciano	Laceration right eye	18
530	3-24-49	Arthur Windahl	Lacerated right ear	20
531	5-14-49	Elias Lahtinen	Fracture left leg	60
532	6-21-49	John A. Johnson	Infection palm right hand	52
533	6-17-49	Joseph Bertino	Fractured bone left foot	19
534	6-21-49	Sam F. Chetto	Contused left foot	12
535	7-6-49	Paul A. Maino	Fracture left shoulder.	
			Fractured lower jaw	112
536	8-1-49	Urho Sepanmaa	Bruised Left hand	24
537	9-7-49	Orville Sather	Fractured right 9th rib	34
538	9-28-49	Henry J. Juchemich	Fractured jaw	54
539	11-30-49	Felix Baldasari	Contusion of head. Brusied left arm & leg.	9
540	11-23-49	William Miron	Contusion right leg	15

In addition to the above, Lauri J. Kivisto was paid for a hernia and Erland M. Wienola was accepted as a silicosis case. Both were occupational disease cases.

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12. NEW CONSTRUCTION AND PROPOSED NEW CONSTRUCTION:

The only new construction for the year was a 12' by 24' addition to the dry building and a small sheet metal clad shed in the headframe.

The addition to the Dry was constructed of concrete blocks with metal lath and plaster on the inside and equiped with a shower and toilet room. This was to accomodate the shift bosses and timber foremen to give them a room for their clean clothes.

The shed in the headframe was to house electric switches.

Much new construction is needed but due to subsidence there is no place to build. Every mine building on the property is developing cracks and settling.

13. EQUIPMENT AND PROPOSED EQUIPMENT:

a. Tractors:

The Athens Mine has a fully equipped D-6 Caterpillar Tractor and is kept in good repair.

b. Power Shovels:

The electric shovel for loading out stockpile was given the general overhauling and was kept in good repair.

The Athens Mine Posseses, 2 Model 21 Eimco underground loaders which are always kept in good repair.

b.1 Power Crane:

It is proposed to request an E & A for the purchase of a 3 ton Hyro Crane some time in March of 1950, equipped with a 3/8 yard digging bucket and a 3 tine grapple for handling timber.

c. Scraper Hoists:

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

	Machines	1949 Total Cost Of		1948 Total Cost Of	
		Repaired	Each Rep.	Repaired	Each Rep.
Sullivan 40 HP Elec.	3	1	339.91	1	192.42
" 15 HP Elec.	17	10	222.81	9	318.46
" 20 Hp Elec.	3	0	---	2	354.69
" 25 HP Elec.	5	3	175.09	0	---
Ing Rand 15 HP Elec	5	0	---	5	530.52
Ing Rand 20 HP Elec.	7	0	---	2	94.53
Ing Rand 25 HP Elec.	8	4	322.40	3	754.55
Total	48	18	4,382.81	22	8,873.15

d. Drill Machines:

Purchases in 1949 and 1948 are listed below:

1949	1948
6 - RB-12 Ing. Rand Jackhammers	8 - RB-12 Ing. Rand Jackhammers
1 - HC-23 Le Roi Rock Drill & Column	2 - J50 " " "
1 - S91 Joy Mfg. Co. Stoper	1 - HC23 Le Roi Rock Drill
4 - L29 Pickhammers	8 - Pickhammer Machines
4 - Ing. Rand Jacklegs	3 - DA-30 Ing. Rand Drifters
	1 - Le Roi Triple Jumbo

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13. EQUIPMENT AND PROPOSED EQUIPMENT:

e. Motor Haulage Cars:

16 - Rocker dump cars purchased from Negaunee Mine, second hand, costing \$2,100.00.

f. Timber Hoists:

No hoists bought in 1949.

14. MAINTANCE AND REPAIRS:

a. Steel Trestles:

Very little work was required in 1949 to maintain the steel trestles.

b. Comparison of Costs - 1949 with 1948:

Maintance and repairs listed under underground costs:

	<u>Amount</u>	<u>Cost Per Ton</u>
1949	98,378.15	.179
1948	162,589.12	.225
Decrease	64,210.97	.046

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

	<u>1949</u>	<u>1948</u>	<u>Increase</u>	<u>Decrease</u>
Comp. & Power Drills	5,488.49	61,046.34		55,557.85
Scraper Equipment	45,739.08	55,093.77		9,354.69
Elec. Tram Equipment	40,428.86	39,905.47	523.39	
Pumping Machinery	6,721.72	6,543.54	178.18	
Total	<u>98,378.15</u>	<u>162,589.12</u>		<u>64,210.97</u>

Purchases 1949: Drill Machines

6 - RB12 Ing. Rand Jackhammers	1,710.00
1 - HC23 Le Roi Rock Drill with Column	825.00
1 - S91 Joy Mfg. Co. Stoper	565.00
4 - Ing. Rand Jacklegs	634.00
6 - L29 Ing. Rand Pickhammers	620.00

Electric Scraper Hoists and Scrapers:

12 - Holcomb scrapers	3,220.13
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Locomotives and Tram Cars:

16 - 65 cu. ft. Rocker Dump Cars - Purchased from Negaunee Mine second Hand	2,100.00
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14. MAINTENANCE AND REPAIRS: (Cont'd)
b. Comparison of Costs - 1949 with 1948: (Cont'd)

Maintenance and repairs listed under surface costs:

	<u>Amount</u>	<u>Cost Per Ton</u>
1949	57,631.09	.104
1948	58,948.40	.116
Decrease	1,317.31	.012

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

	<u>1949</u>	<u>1948</u>	<u>Increase</u>	<u>Decrease</u>
Hoisting Equipment	26,223.08	17,394.64	8,828.44	
Shaft	11,411.81	10,808.69	603.12	
Top Tram Equipment	9,947.46	3,083.22	6,864.24	
D. T. & Pockets	6,585.20	24,267.23		17,682.03
Mine Buildings	3,463.54	3,394.62	68.92	
Total	<u>57,631.09</u>	<u>58,948.40</u>		<u>1,317.31</u>

15. POWER:

Detail of electric current purchased compared with 1948:

	<u>1949 - 12 Mos. Optg.</u>		<u>1948 - 12 Mos. Optg.</u>	
		<u>Per Ton</u>		<u>Per Ton</u>
Stopping	3,503.20	.006	3,693.19	.007
Ventilation	11,568.41	.021	12,245.95	.024
Pumping	20,247.85	.037	19,875.31	.039
Hoisting	30,082.61	.055	29,409.63	.058
Stocking Ore	799.28	.001	815.26	.002
Dry House	613.97	.001	687.60	.001
Lights at Levels	853.00	.002	1,091.08	.002
Compressors	31,905.85	.058	36,558.60	.072
Electric Haulage	3,915.04	.007	3,395.35	.007
Shops	391.62	.001	379.44	.001
Heating Plant	20.10	.000	16.52	.000
Office	32.57	.000	49.40	.000
Storage Battery Loc.	34.93	.000	31.00	.000
Electric Shovel	548.67	.001	630.37	.001
Surface Lights	538.43	.001	397.54	.001
Idle Expense	<u>5,164.37</u>	<u>.009</u>		
Total	<u>110,219.90</u>	<u>.200</u>	<u>109,276.20</u>	<u>.215</u>
Main Line Meter - K.W.	7,732,359		8,143,686	
Separate Meter Readings	7,517,586		7,925,742	
Line Loss	214,773		217,944	
Product	550,000		508,100	
K.W. Per Ton (Inc. Line Loss)	14.0588		16.0752	
Cost Per K.W. (Avg.)	.0142543692		.0137875040	
15 Min. Demand (Avg.)	1560		1531	
Load Factor (Avg.)	62.14		60.17	

17. CONDITION OF PREMISES:

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

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17. CONDITION OF PREMISES: (Cont'd)

b. Athens Mine Houses:

The following statement gives the total cost of repairs and the average cost per house for 1949 and 1948:

Year	No. House	Amount Repairs	Avg. Cost Per House	Rental Income	Taxes and Insurance	Net Income
1949	31	\$ 594.82	\$ 19.19	\$6,012.00	\$3,883.29	\$1,533.89
1948	31	3,351.86	108.12	6,017.89	1,907.52	758.51

18. NATIONALITY OF EMPLOYEES:

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

<u>As To Percentage</u>	<u>1949</u>	<u>Percent</u>	<u>1948</u>	<u>Percent</u>
Finnish	137	39.59	135	39.36
Italian	69	19.94	66	19.25
English	51	14.74	62	18.08
French (Canadian)	43	12.43	32	9.33
Swedish	24	6.93	27	7.88
French (France)	1	.29	3	.88
Danish	1	.29	1	.29
German	4	1.16	5	1.45
Austrian	4	1.16	5	1.45
Norwegian	6	1.73	4	1.16
Irish	3	.87	1	.29
Greek	1	.29	1	.29
Polish	1	.29	1	.29
Scotch	1	.29	0	0
Total	346	100.	343	100.

<u>As To Birth</u>	<u>American Born</u>		<u>Foreign Born</u>	
	<u>1949</u>	<u>1948</u>	<u>1949</u>	<u>1948</u>
Finnish	108	104	29	31
English	43	54	8	8
Italian	39	38	30	28
French (France)	1	3	0	0
French (Canadian)	40	30	3	2
Swedish	21	24	3	3
Scotch	1	1	0	0
German	4	0	0	0
Austrian	4	5	0	0
Norwegian	6	5	0	1
Irish	3	3	0	0
Greek	0	1	1	1
Danish	1	0	0	0
Polish	1	1	0	0
Total	272	269	74	74
Percent	78.6	78.4	21.4	21.6

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1. GENERAL:

The Cambria-Jackson Mine operated on a twelve-shift per week schedule from January 1st until June 27th. A reduction was then made to the five-days-per-week working schedule, and this was in effect during the remainder of the year. As a result of the strike by the United Steelworkers (C.I.O.), the mine was out of production from October 1st to November 14th (six weeks). During this idle period the average number of men working (supervisors, pumpmen, hoisting engineers) amounted to twenty-two. The underground maintenance and repair work was carried on by the supervisory force, who also assisted in the pumping operations where necessary. The strike was peaceful, with comparatively few pickets, and no inclination on the part of the striking employees to work.

The production for the year 1949 amounted to 434,210 tons in ten and one-half months' operation. This tonnage is an improvement as compared with 1948 when reduced to a similar working schedule. The average production per day in 1948 amounted to 1,756 tons and in 1949, 1,772 tons. All ore was shipped from the stockpiles with a substantial overrun resulting.

During the course of mining operations in 1949 only a small additional reserve tonnage was found by exploration work. As far as is presently known all ore deposits above the present working level have been explored and outlined, either by mine development or diamond drilling.

Development work for the new 8th Level was continued throughout the year and by the end of December the conveyor drift had been completed to an inclined depth of 255 feet, and was ready for the installation of the conveyor equipment. The drive, or upper, end of the conveyor empties into two large steel-lined bins having a total capacity of sixty 4-ton cars. This storage room will greatly facilitate the remaining advance of the drift as well as production during future mining operations.

2. PRODUCTION
SHIPMENTS &
INVENTORIES:

a. Production by Grades:

	<u>1949</u>	<u>1948</u>	<u>Increase</u>	<u>Decrease</u>
Cambria Lease	6,714	856	5,858	-
Jackson Strip	427,496	490,961	-	63,465
Total Ore	434,210	491,817	-	57,607
Rock	12,208	10,220	1,988	-
Total Hoist	446,418	502,037	-	55,619

The above figures include a stockpile overrun of 8,354 tons.

b. Shipments:

	<u>Pocket</u> <u>Tons</u>	<u>Stockpile</u> <u>Tons</u>	<u>Total</u> <u>Tons</u>	<u>Total Tons</u> <u>Last Year</u>
Cambria Lease	4,908	1,586	6,494	-
Jackson Strip	236,927	159,319	396,246	511,691
Total 1949	241,835	160,905	402,740	511,691
Total 1948	324,034	187,657	511,691	-
Decrease	82,199	26,752	108,951	-

Shipments decreased 21.3% in 1949 and were 31,470 tons less than the product for the year.

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

c. Stockpile Inventories:

	<u>Dec. 31, 1949</u>	<u>Dec. 31, 1948</u>	<u>Increase</u>
Cambria Lease	1,076	856	220
Jackson Strip	<u>63,415</u>	<u>32,165</u>	<u>31,250</u>
Total	<u>64,491</u>	<u>33,021</u>	<u>31,470</u>

d. Division of Product by Levels:

	<u>1949</u>	<u>Percentage</u>	<u>1948</u>	<u>Percentage</u>
6th Level	6,714	1.55	79,144	16.09
7th Level	<u>427,496</u>	<u>98.45</u>	<u>412,673</u>	<u>83.91</u>
Total	<u>434,210</u>	<u>100.00</u>	<u>491,817</u>	<u>100.00</u>

e. Production by Months:

<u>Month</u>	<u>Cambria Lease</u>	<u>Jackson Strip</u>	<u>Total Ore</u>	<u>Rock</u>
January	-	38,850	38,850	424
February	595	45,345	45,940	36
March	267	46,974	47,241	1,536
April	491	39,289	39,780	2,132
May	1,230	41,339	42,569	2,224
June	1,584	49,177	50,761	1,764
July	779	33,788	34,567	1,136
August	487	26,806	27,293	1,160
September	100	40,909	41,009	1,056
October	-	60	60	-
November	357	18,360	18,717	364
December	<u>719</u>	<u>38,350</u>	<u>39,069</u>	<u>376</u>
	<u>6,609</u>	<u>419,247</u>	<u>425,856</u>	<u>12,208</u>
Overrun	<u>105</u>	<u>8,249</u>	<u>8,354</u>	-
Total 1949	<u>6,714</u>	<u>427,496</u>	<u>434,210</u>	<u>12,208</u>
Total 1948	<u>856</u>	<u>490,961</u>	<u>491,817</u>	<u>10,220</u>
Increase	<u>5,858</u>	-	-	<u>1,988</u>
Decrease	-	63,465	57,607	-

f. Ore Statement:

	<u>Camb.Lease</u>	<u>Jack.Strip</u>	<u>Tot.1949</u>	<u>Tot.1948</u>
On hand Jan. 1, 1949	856	32,165	33,021	52,895
Output for year	6,609	419,247	425,856	485,863
Overrun	<u>105</u>	<u>8,249</u>	<u>8,354</u>	<u>5,954</u>
Total	<u>7,570</u>	<u>459,661</u>	<u>467,231</u>	<u>544,712</u>
Shipments	<u>6,494</u>	<u>396,246</u>	<u>402,740</u>	<u>511,691</u>
Bal. on hand Dec. 31, 1949	1,076	63,415	64,491	33,021
Increase in output	5,753	-	-	-
Decrease in output	-	65,760	60,007	55,809
Increase in ore on hand	220	31,250	31,470	-
Decrease in ore on hand	-	-	-	19,874

1949 - Six 2-8 hour shifts, 1-1-49 to 6-27-49.
- Five 2-8 hour shifts, 6-27-49 to 12-31-49.

1948 - Six 2-8 hour shifts, 1-1-48 to 12-31-48.

1947 - Six 2-8 hour shifts, 1-1-47 to 12-31-47.

g. Delays:

2-8-49, 3 hours delay - Loss of product - 300 tons.
Broken larry-car axle.

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

g. Delays: (Cont'd)

- 2-28-49, 4 hours delay - No loss of product.
Shoe loose on skip, caught on stringer bolts in headframe.
- 3-31-49, 1-1/2 hours delay - Loss of product - 200 tons.
Overheated skip-hoist bearing.
- 6-9-49, 2 hours delay - Loss of product - 250 tons.
Cutting skip rope.
- 6-13-49, 1-1/2 hours delay - Loss of product - 150 tons.
Due to broken sheave *liner*.
- 8-29-49, 1 hour delay - Loss of product - 110 tons.
Cutting skip rope.

The total loss of product from the six delays listed above amounted to 1,010 tons, as compared with thirteen delays and a loss of 5,275 tons in 1948.

h. Delays due to Lack of Current:

- 7-28-49, 3-1/2 hours delay - Loss of product - 450 tons.
Electrical storm and low voltage.

3. ANALYSIS:

a. Average Mine Analysis on Output:

	<u>Grade</u>	<u>Tons</u>	<u>Iron</u>	<u>Phos.</u>	<u>Silica</u>	<u>Sulphur</u>
Cambria-Jackson		434,210	58.66	.089	9.50	.058

b. Average Mine Analysis on Straight Cargoes:

All ore shipped was mixed with other grades.

4. ESTIMATE
OF ORE
RESERVES:

a. Developed Ore:

- Assumption: 12.00 cubic feet equals one ton.
10% deduction for loss in mining and rock.
- Percentage of Bessemer: None.

<u>Area</u>	<u>Standard Ore</u>			<u>Total</u>	<u>Sulphurous Ore</u>	
	<u>Negaunee</u>		<u>Ishpeming</u>		<u>Jackson</u>	
	<u>Lease</u>	<u>Strip</u>	<u>Strip</u>		<u>Strip</u>	<u>Strip</u>
Above 5th Lev.-Dep.#1	18,429			18,429		
Bet. 5th&6th Lev.-Dep.#1	9,725					
Bet. 5th&6th Lev.-Dep.#2	2,667	15,325				
Tot. Bet. 5th&6th Levs.	12,392	15,325		27,717		
Bet. 6th&7th Lev.-Dep.#2	3,188	555,378			443,212	
Bet. 6th&7th Lev.-Dep.#3			7,320			
Bet. 6th&7th Lev.-Dep.#4						99,018
Tot. Bet. 6th&7th Levs.	3,188	555,378	7,320	565,886	443,212	99,018
Below 7th Level-Dep.#2		14,167			127,033	
Below 7th Level-Dep.#3		1,979	7,500			
Below 7th Level-Dep.#4						207,917
Tot. Below 7th Level		16,146	7,500	23,646	127,033	207,917
Gross as of Sept. 1, 1949	34,009	586,849	14,820	635,678	570,245	306,935
Less Sept. Production	100	40,909		41,009		
Gross as of Oct. 1, 1949	33,909	545,940	14,820	594,669	570,245	306,935
Less Prod. (Nov.&Dec.)	1,076	43,406	2,292	46,774	11,072	
Gross as of Dec. 31, 1949	32,833	502,534	12,528	547,895	559,173	306,935
Less 10% for Mng.&Rock	3,391	54,594	1,482	59,467	57,024	30,694
Net Tot. as of Dec. 31, 1949	29,442	447,940	11,046	488,428	502,149	276,241

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4. ESTIMATE
OF ORE
RESERVES: (CONT'D)

STANDARD
b. Total Developed Ore:

	<u>Cambria Lease</u>	<u>Jackson Strip</u>	<u>Total</u>
1949 Estimate	29,442	458,986	488,428
1948 Estimate	63,399	854,574	917,973
Decrease	33,957	395,588	429,545

The ore estimate of the Cambria-Jackson Mine, composed of the Cambria Lease and the Jackson Strip, is divided between the City of Negaunee and the City of Ishpeming. The estimate is also divided into standard and high-sulphur grades. The total amount of ore developed during the course of mining operations amounted to 4,665 tons in 1949. This low figure very clearly indicates that the ore reserves are fairly well defined.

c. Expected Average Natural Analysis:

Grade: Non-Bessemer Trade Name: Cambria-Jackson

<u>Tons</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Mang.</u>	<u>Alum.</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Loss</u>	<u>Moist.</u>
488,428	51.23	.080	8.79	.17	2.48	.50	.18	.052	2.12	12.53

Grade: Non-Bessemer Trade Name: Cambria-Jackson

<u>Tons</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Mang.</u>	<u>Alum.</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Loss</u>	<u>Moist.</u>
778,390	52.50	.105	6.56	.11	2.44	.61	.44	.263	1.69	12.50
1,266,818										

d. Ore in Stock: Average Natural Analysis:

Grade: Non-Bessemer Trade Name: Cambria-Jackson

<u>Tons</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Mang.</u>	<u>Alum.</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Loss</u>	<u>Moist.</u>
64,491	51.11	.084	8.01	.19	2.44	.48	.17	.046	2.23	12.90

5. LABOR
AND
WAGES:

a. Comments:

The relationship between the mine management and the union continued to be satisfactory during the year. There were no grievances presented during the year and the grievance committee met monthly with the mine captain and the superintendent to discuss various items of mutual interest. For the most part, these items included a general improvement of conditions underground.

There were 228 men on the payroll on December 31st, 1949, as compared with a like figure on December 31st, 1948. The following is a compilation of accessions and separations:

Accessions:

Transferred from Athens Mine	4
Transferred from Storehouse	1
Transferred from Negaunee Mine	8
Transferred from Mather "A" Mine	17
Straight Hires	17
Total	47

Separations:

Retired	3
Transferred to other mines	33
Discharged	2
Quit	6
Laid off	2
Settlement due to disability	1
Total	47

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5. LABOR
AND
WAGES: (CONT'D)

b. Comparative Statement of Wages and Product:

	<u>1949</u>	<u>1948</u>	<u>Increase</u>	<u>Decrease</u>
<u>Product:</u>	434,210	491,817	-	57,607
No. Shifts and Hours 1-8	-	12	-	12
2-8	<u>245</u>	<u>274</u>	-	29
Total	<u>245</u>	<u>286</u>	-	41
<u>Average No. Men Working:</u>				
Surface	50	53	-	3
Underground	<u>172</u>	<u>171</u>	<u>1</u>	-
Total	<u>222</u>	<u>224</u>	-	2
<u>Average Wages per Day:</u>				
Surface	11.52	11.14	.38	-
Underground	<u>13.51</u>	<u>12.88</u>	<u>.63</u>	-
Total	<u>13.06</u>	<u>12.46</u>	<u>.60</u>	-
<u>Average Wages per Month:</u>				
Surface	272.93	267.12	5.81	-
Underground	<u>315.84</u>	<u>309.11</u>	<u>6.73</u>	-
Total	<u>306.17</u>	<u>299.09</u>	<u>7.08</u>	-
<u>Product per Man per Day:</u>				
Surface	34.68	31.94	2.74	-
Underground	<u>10.21</u>	<u>10.00</u>	<u>.21</u>	-
Total	<u>7.89</u>	<u>7.62</u>	<u>.27</u>	-
<u>Labor Cost per Ton:</u>				
Surface	.332	.348	-	.016
Underground	<u>1.322</u>	<u>1.288</u>	<u>.034</u>	-
Total	<u>1.654</u>	<u>1.636</u>	<u>.018</u>	-
<u>Average Product Mining:</u>				
Stopping	27.79	31.63	-	3.84
Development in Ore	<u>8.55</u>	<u>7.78</u>	<u>.77</u>	-
Total	<u>25.28</u>	<u>31.11</u>	-	5.83
<u>Average Wages Contract Labor:</u>	14.66	13.62	1.04	-
<u>Total Number of Days:</u>				
Surface	12,520	15,400	-	2,880
Underground	<u>42,509</u>	<u>49,182</u>	-	6,673
Total	<u>55,029</u>	<u>64,582</u>	-	9,553
<u>Amount for Labor:</u>				
Surface	144,264.88	171,490.27	-	27,225.39
Underground	<u>574,278.63</u>	<u>633,369.70</u>	-	59,091.07
Total	<u>718,543.51</u>	<u>804,859.97</u>	-	86,316.46
<u>Average Wages per Mo. as per Labor Statement-Less Captain & Clerks:</u>				
Surface	274.80	268.25	6.55	-
Underground	<u>314.89</u>	<u>308.43</u>	<u>6.46</u>	-
Total	<u>306.39</u>	<u>299.36</u>	<u>7.03</u>	-
<u>Proportion of Surface to Underground Men:</u>				
1949 - 1 to 3.44				
- Six 2-8 hour shifts, 1-1-49 to 6-27-49				
- Five 2-8 hour shifts, 6-27-49 to 12-31-49				
1948 - 1 to 3.19				
- Six 2-8 hour shifts, 1-1-48 to 12-31-48				
1947 - 1 to 3.20				
- Six 2-8 hour shifts, 1-1-47 to 12-31-47				

Note:

	<u>1949</u>	<u>1948</u>
Proportion of Vacation Pay for Surface	5,271.57	6,571.38
Proportion of Vacation Pay for Underground	<u>22,232.35</u>	<u>21,944.93</u>
Total	<u>27,503.92</u>	<u>28,516.31</u>

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6. SURFACE:

a. Buildings:

Engine House:

In July work was started in enlarging the present motor base of the hoist motor to accomodate the larger motor which was installed the following month. During the one-week vacation commencing on August 15th, the 500-H.P. hoist motor was removed and replaced by a 700-H.P. motor which had previously been used for hoisting at the Maas Mine. A new shaft and pinion were also installed and the pillow-block bearings were rebabbitted. Operations were resumed on August 23rd and it was necessary to make final adjustments during the remainder of the month.

The hand-firing method of heating the engine house was changed in December by the installation of a 70-pound capacity stoker. This addition greatly improved working conditions in the engine house as well as resulting in a substantial saving in coal.

Dryhouse:

In February the stoker of the main hot-water and heating plant in the dry was overhauled. During this period a temporary boiler was set up outside as a replacement.

In the boiler room of the dry two hot-water tanks were installed and re-arranged. Copper pipe was used in an effort to prevent the constant replacement of iron pipe due to corrosion. This work was done in August, and the following month the vacuum system then in use was converted to a gravity and high-pressure system by the installation of a condensate pump which was installed in a concrete inclosure just north of the small hoisthouse.

In the shower room of the dry glazed tiling was installed to a height of seven feet on the four walls. This tiling had been removed from the Princeton Mine and its installation greatly improved the cleanliness and appearance of the shower room.

Office:

In February a meeting room was completed in the basement of the office to be used for safety meetings of supervisors and employees.

Shops:

An oil forging furnace was installed in the blacksmith shop in October, but was not put into operation until late in December due to the need of several replacement parts. This oil furnace was originally used at the Cliffs Shaft Mine, and was installed at the Cambria-Jackson Mine so that a more even temperature could be maintained during drill-sharpening and tempering operations.

Shafthouse:

A new steel car-barn was built on the rock trestle adjoining the west side of the shafthouse. During the summer the roof and sides were insulated and a composition roof was laid. In November a unit-heater was installed to maintain a temperature well above freezing. This building has greatly reduced the delay during severe winter weather to the top-tram cars.

The steel members under the top-tram floor in the shafthouse were scraped and painted with acid-resisting paint and a general repair was made to the floors and decking on the tramping level. In August the steel members under the pockets at the collar of the shaft were also scraped and painted. In November a portion of this inclosure was insulated and a radiator was installed to prevent constant icing conditions during the winter months.

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6. SURFACE: (CONT'D)

a. Buildings: (Cont'd)

Shafthouse: (Cont'd)

In September a contract was let to Kleen Structures, Inc., of Green Bay, Wisconsin to clean, sandblast and paint the ferroboard which incloses the headframe. The aluminum paint was supplied by the Company and the painting will prevent the rusting effect of condensate which forms intermittently during the year.

Old Shop Building:

In August the old blacksmith, carpenter and machine shop building, located just north of the shaft, was sold and dismantled. The grounds were then cleaned up resulting in a great improvement in the general appearance of the property.

Steel Warehouse:

The steel warehouse was given one coat of red-oxide paint near the middle of the year to cover the light primer coat which was applied by the manufacturer.

b. Ore and Rock Trestles:

The north and south ore trestles were filled to capacity just prior to the 1949 shipping season. For the second consecutive year it was possible to ship all ore in stock without dismantling or damaging the ore trestles. This condition has proven very economical and, near the end of the shipping season, it was necessary to replace only three new trestle legs which had been damaged by frozen ore. In September the trestles were re-aligned and braced.

c. Railroad Tracks:

There was no change in the general railroad track layout on the mine property.

d. Fences and Caves:

In April all fences inclosing the caved ground to the west and south were inspected and repaired. Several danger signs were also used where active subsidence was noted.

Two concrete weirs were installed in the discharge ditch above and below and east of the active cave, approximately 500 feet south of the steel warehouse. These weirs were installed under the direction of a Bureau of Mines supervisor and a close check was made to determine the possible loss of water through cracks in the area. The results indicated that a small loss was noted and it is possible that the discharge ditch will have to be relocated in 1950.

e. Grounds:

Further improvement of the grounds surrounding the shaft and buildings was completed during 1949. The parking lot was increased in size by leveling off the rockpile into the old caved area west of the shaft. This will allow not only greater parking space but also additional room for snow during the winter months.

Approximately ninety cedar trees were planted early in May just west of the idler stands between the engine house and shaft.

An eighteen-foot rock fill was made along the east side of the high timber track to facilitate the unloading of stull timber from railroad cars with the hydrocrane. This lane will allow the crane to operate between the loaded car and the stull timber pile.

An additional fire hydrant was installed at the extreme south end of the timber yard for added fire protection.

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6. SURFACE: (CONT'D)

f. Auxiliary Shaft:

The small auxiliary shaft which is used as an escapeway and located between the engine house and the main shaft was repaired during July. This was necessary to permit its use during August at the time when the shaft hoist motors were being changed. The collar of the shaft was also raised above the ground level to prevent drainage into the shaft during the spring breakup and in heavy rain storms.

7. UNDERGROUND:

a. Shaft Sinking:

There was no shaft sinking in 1949.

b. Development:

The following table gives a comparison of the total feet of drifting and raising in ore and rock in 1949 and 1948:

<u>Year</u>	<u>Drifting</u>		<u>Raising</u>		<u>Grand Total</u>
	<u>Ore</u>	<u>Rock</u>	<u>Ore</u>	<u>Rock</u>	
1949	9,469'	1,724'	5,573'	560'	17,326'
1948	8,763'	1,268'	4,181'	1,104'	15,316'
Increase	706'	456'	1,392'	-	2,010'
Decrease	-	-	-	544'	-

The increase in the amount of raising and drifting in ore and rock in the years 1948 and 1949 was the result of the development of several sublevel stopes.

b-1. Rock Development:

The following table gives the total footage of rock drifting and raising in 1949 and 1948:

	<u>Drifting</u>	<u>Raising</u>	<u>Total 1949</u>	<u>Total 1948</u>
6th level and above	220'	43'	263'	1,294'
7th level and above	1,504'	517'	2,021'	1,078'
Total 1949	1,724'	560'	2,284'	2,372'
Total 1948	1,268'	1,104'	2,372'	-
Increase	456'	-	-	-
Decrease	-	544'	88'	-

The rock work during the year was largely concentrated in the conveyor area which was in the process of development during 1949. With this exception there was no main level drifting in rock during 1949. All ore deposits are known and fairly well-defined on and above the 7th Level.

b-2. Ore Development:

The following is a summary of ore development in 1949, as compared with 1948:

	<u>Drifting</u>	<u>Raising</u>	<u>Total 1949</u>	<u>Total 1948</u>
6th level and above	1,516'	938'	2,454'	2,545'
7th level and above	7,953'	4,635'	12,588'	10,399'
Total 1949	9,469'	5,573'	15,042'	12,944'
Total 1948	8,763'	4,181'	12,944'	-
Increase	706'	1,392'	2,098'	-

The ore development footage for the year was fairly well distributed throughout the entire mine. In some instances where additional height of ore was to be caved it was necessary to develop this height by raising and drifting. Thus a considerable portion of the above footage can be classed as dog-drifting and raising where the ground for the most part is hard enough, not requiring support.

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7. UNDERGROUND: (CONT'D)

c. Stoping:

(1) General:

At the end of the year 1949 there were twenty active contracts in operation. One of these contracts was engaged in driving the conveyor drift in rock and thus could be eliminated for comparative reasons. In 1948 twenty-three contracts were active, all of which were carrying on mining or development operations.

In general, mining operations throughout the year were quite favorable. Approximately 21% of the time of all active mining contracts was charged to timber repairs, or other non-productive work. This figure compares with 25% during 1948.

Two large sublevel stopes were in operation during the last half of 1949. However, soon after maximum production had been reached a considerable amount of ground pressure and movement developed in the area. This condition prevented the use of long-hole drilling and it was necessary in one case to abandon stoping operations entirely and develop for sublevel caving.

The practice of taking down timber and supplies and hoisting rock, as well as any ore available, was continued on the midnight shift by a crew of ten men throughout 1949. Under favorable underground conditions an average of over 150 tons of ore were hoisted on the midnight shift.

The location and number of mining contracts at the end of 1949, as compared with 1948, are as follows:

<u>Location of Contracts</u>	<u>December 31st, 1949</u>	<u>December 31st, 1948</u>
<u>Sixth level and above</u>		
Fifth level	1	-
370' sublevel	-	1
Sixth level	2	1
<u>Seventh level and above</u>		
90' sublevel	1	1
25' sublevel	1	2
00' sublevel	-	2
-25' sublevel	3	4
-50' sublevel	6	6
-60' sublevel	-	2
-80' sublevel	5	2
Seventh level	<u>1</u>	<u>2</u>
Total	20	23

Occupation of contracts was as follows:

	<u>Dec. 31st,</u> <u>1949</u>	<u>Dec. 31st,</u> <u>1948</u>
Sublevel caving, or developing for sublevel caving	9	11
Sublevel stoping	2	2
Developing for sublevel stoping	1	2
Drifting	5	1
Raising	-	2
Developing	1	-
Repairing	<u>2</u>	<u>5</u>
Total	20	23

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7. UNDERGROUND: (CONT'D)
c. Stoping: (Cont'd)
(2) Detail of Stoping:

Cambria Lease:

Sublevels above the 6th Level:

5th Level Orebody:

Development was continued during the first four months of 1949 on the 5th level elevation. The original ore outline as shown by the diamond-drill holes indicated a small ore concentration, approximately 270 feet east of the 5th level south drift. This was developed and stoping operations were carried on during May and June. The jasper capping was found to be approximately 50 feet above the floor of the 5th level transfer, and the stope was approximately 50 feet in length and 40 feet in width. By the end of June, slightly over 4,000 tons of ore had been mined. During the remainder of the year additional development was necessary in the central, or main, deposit where approximately 60,000 tons was estimated. In December, a drift was extended from footwall to hanging wall on a sublevel 50 feet above the 5th level transfer. From this development it was found that the orebody was approximately 110 feet in length and 80 feet in width. It should also be noted that sublevel caving of this ore will be necessary, due to its softness and the small but increasing amount of water. This ore will be completely mined during 1950, at which time all known and available ore in the Cambria Lease will have been exhausted.

Jackson Strip:

6th Level - 6th Level Pillar:

The orebody known as the "6th level pillar" was mined during the year by three contracts. Early in the year, one raise had already been completed from the 7th to the 6th level elevation. A second was in progress near the south edge of the orebody. During the course of mining operations it was necessary to maintain a ventilation and supply drift with the 6th Level, and mining operations were carried on almost entirely by transfers from Raise No. 770. It might be mentioned that due to the very unstable rock on the 7th Level it was impossible to locate the three new raises in the correct position to mine this relatively large pillar, thus a transfer system has been necessary. In December, mining was being completed on the 6th Level by one contract located just south of the east-west dike.

Sublevels above the 7th Level:

90' Sublevel - East Pillar:

Near the middle of the year a drift was driven north and south of Raise No. 770 on the 90-foot sublevel, a total distance of 293 feet. This drift intersected two crossdikes and nearly paralleled the main dividing dike to the west. The orebody was approximately 150 feet in width and crosshauls were started on either side of the drift from the south and working toward the north. In December, two mining contracts were driving crosshaul drifts and caving between the main dividing dike and the east footwall.

70' Sublevel - East Pillar:

Raise No. 774 was completed to this sublevel elevation in January. Immediately thereafter a cutout was made and a connecting drift driven to the south transfer on the 90-foot sublevel. During the year a pillar in the extreme south end of the orebody was mined on the 70- and 50-foot sublevels. This mining was carried on in advance of and below

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7. UNDERGROUND: (CONT'D)
c. Stoping: (Cont'd)
(2) Detail of Stoping: (Cont'd)

Jackson Strip: (Cont'd)

Sublevels above the 7th Level: (Cont'd)

70' Sublevel - East Pillar: (Cont'd)

other operations to the north in an effort to drain the water immediately under the jasper capping, which was originally drawn off on the 6th Level. In December, stoping operations were being carried on on the 50-foot sublevel north of a small dike west of the raise. This stope completed the mining of all available ore at these elevations under the capping, and the area was temporarily abandoned until such a time as mining to the north is completed on the upper sublevels.

60' Sublevel - East Pillar:

Raise No. 770 was cut out at this elevation in May. A transfer drift was extended to the north approximately 105 feet, and to the south 120 feet. Thereafter raises were extended up to the 90-foot sub, and were used in mining during the year.

35' Sublevel - Central Deposit:

In April development was started to explore two short runs of ore, one of which was found in Diamond Drill Hole No. 116 and another in Diamond Drill Hole No. 174. The latter was drilled from a drift driven south of Raise No. 747 at the 35-foot sublevel elevation. Drifting operations were started from a mill raise which was used in the development of a stope, which was mined out earlier in the year from Raise No. 739. This drift was driven to the north 100 feet in jasper. A raise was then extended to the 90-foot sublevel, a distance of 43 feet, where a cutout was made and a second drift driven to the east. A small stope was then started which later holed to old 6th level workings, and only a limited amount of production resulted. Stoping operations were completed in July, and the area was abandoned as far as any further mining was concerned.

25' Sublevel - Central Deposit:

Early in the year two mining contracts were completing mining operations on this sublevel in an area adjacent to the dike in the east portion of the central deposit. These mining operations were being carried on from Raises No. 709 and No. 711 and the sublevel was completed in April, 1949.

00' Sublevel - Central Deposit:

Mining operations were started at this elevation in March from Raise No. 713. Shortly thereafter, two additional gangs moved to Raises No. 711 and No. 709. During the course of mining there was a pronounced reduction in the size of the area, due to the flattened footwall cutting off approximately 60 feet of area. In addition to this a horse of jasper was also encountered and used as a mining limit, 70 feet south of the east-west line of raises. This sublevel was completed in July and operations were continued on the -25-foot sublevel.

-25' Sublevel - Central Deposit:

In September, two mining contracts commenced operations at this elevation from Raises No. 711 and No. 713. Two drifts were driven into the footwall and again it was found that the footwall had reduced the mining area size by approximately 60 feet. In December, Contract No. 18 completed caving operations north and east of Raise No. 711. Thereafter, a second crosshaul drift was started to the south and parallel to the main dike.

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7. UNDERGROUND: (CONT'D)
c. Stoping: (Cont'd)
(2) Detail of Stoping: (Cont'd)

Jackson Strip: (Cont'd)

Sublevels above the 7th Level: (Cont'd)

-25' Sublevel - Central Deposit: (Cont'd)

The advance for the month amounted to 60 feet. Mining Contract No. 3 advanced a second drift into the footwall approximately 45 feet, and near the end of the month had caved the north portion of the drift.

Early in the year mining operations were being carried on in the main portion of the central orebody by three mining contracts. A pillar approximately 50 feet in width remained between the north and south series of raises above the No. 730 Crosscut. The mining of this pillar was completed in April, and immediately thereafter these mining gangs were moved to the -50-foot sublevel.

-25' Sublevel - East Pillar:

In January 1949, drifting operations were being carried on in the 6th level ore pillar on the -25-foot sublevel. A transfer drift was extended 140 feet northwest of Raise No. 703 in ore. This transfer was driven for use in mining the north portion of the 6th level orebody. The deposit is bounded on the north by the jasper footwall, on the east by a 25-foot dike which separates the central deposit from the east orebody. To the south the pillar continues, and is being mined by three contracts using the sublevel caving system. The west side of this area is bounded by seven sublevels of old workings from the 6th Level to the 00-foot sublevel. This extreme east end of the orebody was mined several years ago by the top-slicing mining method. Generally speaking the ore was relatively hard, as was the jasper capping. From the northwest transfer mentioned above two secondary transfers were driven to the northeast, one just above the primary transfer at an elevation of -20 feet, the second on the 25-foot elevation (50 feet above). The latter drift was driven 150 feet northeast of the transfer raise into the slate footwall. At this point a double-compartment cribbed raise was extended 83 feet to the 6th Level. This raise was to be used for ventilation and traveling between the 6th and 7th Levels, replacing Raise No. 704 which would ultimately be caved by stoping operations. Three sublevel drifts were also driven on the 50-foot, 70-foot and 6th level elevations. These drifts, at intervals of about 30 feet apart, were to be used for long-hole drilling during the course of stoping operations.

In July 1949, stoping operations were started at the 6th level elevation. During the opening of the stope around the northmost mill raise a large open caved area was holed to, just east of the stope. This unmapped opening was approximately 110 feet in length and an average of 40 feet in width, and was likely the result of caving ore during slicing operations on the lower sublevel several years ago. The discovery and location of this opening immediately altered the original plans of stoping, inasmuch as a second stope to the east was to be developed immediately under this area. During the remainder of the year, however, stoping operations were continued by mining rooms, large enough to support themselves. A 10- or 12-foot pillar was left between these openings in an effort to mine as clean and as safely as possible. The caved opening to the east allowed the unsupported jasper capping to crack and fall into the various stopes as they were abandoned. By the end of the year the entire area became very heavy, and it was necessary to abandon this method of mining.

As previously mentioned a second stope was opened in May, leaving a 25-foot floor pillar under the caved opening which was located on the 6th Level. Once again it was necessary to mine out this north portion

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7. UNDERGROUND: (CONT'D)
c. Stoping: (Cont'd)
(2) Detail of Stoping: (Cont'd)

Jackson Strip: (Cont'd)

Sublevels above the 7th Level: (Cont'd)

-25' Sublevel - East Pillar: (Cont'd)

of the area by small rooms. This operation was continued throughout the year under fairly satisfactory conditions. In 1950, the camelback between the two stopes will be caved and the area to the south developed for sublevel caving.

-50' Sublevel - Central Deposit:

This sublevel was opened to mining in 1948, and by the end of the year the extreme west end had been mined as well as a small area adjacent to the jasper footwall in the north and central portions. During 1949 almost the entire sublevel was mined. The area is approximately 600 feet in length and 200 feet in width. Nine contracts were mining at this elevation during most of the year. The irregular orebody is bounded to the north by jasper and lean ore on the footwall, on the west by jasper capping, and to the south and east by 20- to 30-foot dikes. During the course of mining two large jasper intrusions reduced the size of the orebody, and had some bearing on the analysis of the ore mined in this locality. In April, Raise No. 773 was extended approximately 25 feet from the level to the -80-foot sublevel, and a transfer drift was driven to the west. Two mining contracts were then located in this east part of the central orebody mining to the north, inasmuch as the flattened footwall had rendered three raises useless for further mining from the north. By the end of the year several small pillars remained to be mined on the -50-foot sublevel.

-60' Sublevel - Central Deposit:

Near the end of 1948, stoping operations were nearing completion in a small area at the extreme west end of this deposit. The stope is surrounded to the northeast and south by jasper and to the west by the fault dike. One contract completed this stope in March and thereafter commenced drifting on the -80-foot sublevel to remove the floor of the stope, which at the -60-foot elevation was approximately 70 feet in width and 80 feet in length.

-60' Sublevel - West Deposit:

In January 1949, two mining contracts were located in the west deposit where this high-sulphur ore joins the Mather Mine property. One gang completed caving operations in March from Raise No. 767 and was moved to the 6th level east pillar. The other mining gang carried on stoping operations from Raise No. 751 in an area south of the dike and west of the No. 750 Crosscut. A stope approximately 80 feet by 60 feet was developed, surrounded on three sides by jasper and bounded on the north by dike. Operations were completed in July, and this gang was dissolved to fill other mining contracts.

-80' Sublevel - Central Deposit:

This sublevel is approximately 20 feet above the 7th Level, and will be the bottom sublevel for all mining in the central orebody. In May, Raise No. 720 was cut at this elevation and a drift was driven approximately 155 feet west of the raise and just north of the south boundary dike. Immediately thereafter, an extension was driven from the end of the transfer west of Raise No. 773 for ventilation and traveling. Caving operations were then started from a crosshaul drift north of the east end of the No. 720 Transfer. In December, one drift had been caved and a second was advanced 48 feet toward a 65-foot mining limit. This mining area is located on the south side of the east part of the central deposit.

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7. UNDERGROUND: (CONT'D)
- c. Stoping: (Cont'd)
- (2) Detail of Stoping: (Cont'd)
- Jackson Strip: (Cont'd)
- Sublevels above the 7th Level: (Cont'd)
-
- 80' Sublevel - Central Deposit: (Cont'd)

In April, No. 16 Contract extended Raise No. 739-A to the -80-foot sublevel, and after completing a cutout extended the drift 128 feet west to the fault dike. Four mills were extended to the 00-foot sublevel 80 feet above and stoping operations were started, leaving a pillar on the north side along the mined-out stope which had been completed earlier in the year. In August a second drift was driven northwest of the raise along the jasper footwall to cave the floor pillar below the stope, as well as to draw the remaining broken ore which lay on the footwall in the old stope. Operations were completed near the end of December.

In April, a cutout was made just above the No. 730 Cross-cut, 30 feet west of Raise No. 738. A drift was extended to the south 120 feet, parallel and just under the jasper capping. This drift was caved back to the level, and during the remainder of the year two additional caving drifts were driven and caved at approximately 25-foot centers, east of the first drift. In December, 40 feet of drift remained to be caved. In September, a third contract started a cutout 20 feet west of Raise No. 734. In December a drift was completed to the south 170 feet through the south dike, in an effort to explore the small area between the main dike and a branch dike.

7th Level:

In March development work was started by extending two raises 40 feet above the level. These raises were the start of the storage pockets for the conveyor and drift through which the 8th level ore will be elevated to the 7th level storage pockets. These pockets are located approximately 200 feet northwest of Raise No. 745 in the footwall drift. The following month a short crosscut was driven from a point on the curve west of the pocket location, south to the 7th level intersection of the incline conveyor drift. By the end of the year the drift had been extended to the southwest 255 feet from the pockets at 15° and was supported by 4" steel H-beams spaced at 5-foot centers. For the most part the drift was driven in relatively soft slate which stands well and has shown no signs of weight. This drift is being directed on a course of S54°30'W and will be extended approximately 600 feet on the incline. Late in the year the raises which had been used as pockets were enlarged and supported by 12"x14" fir timber, and 3/8" steel plate on 3" fir plank was used as a lining. The pockets have a total capacity of 40 cars (160 tons) and will be equipped with a remote control switch located at the 8th level feeder pocket. Near the end of December the conveyor equipment was being moved underground for installation. Approximately 236 feet of conveyor belt will be installed in the first step and this conveyor will be used in elevating the rock from the next interval of drift.

During 1949 a considerable number of steel sets were installed in various parts of the drift where timber supports showed signs of failure. Generally speaking there was relatively little weight and the maintenance of the 7th level drift has not been of any particular consequence. During the coming year, however, this condition may become somewhat more serious as mining operations approach the 7th level elevation.

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7. UNDERGROUND: (CONT'D)

d. Timbering:

There was slightly more timber used in 1949 in proportion to the production, and despite the reduced working schedule as well as the 45-day strike idle period. This increase is due to a larger amount of development in proportion to the tons produced, as well as the need of constantly retrimbering heavy areas throughout the mine.

The use of 4-inch H-section steel sets was continued throughout 1949 in all the main level drifts and crosscuts. These sets have resulted in a substantial saving in labor costs, due to the fact that erection of a steel set requires less time than the use of timber and its strength is permanent. Later in the year a 6-inch H-section steel beam was used in supporting the conveyor drift. Steel sets of this size were also used in various main level turnouts where long spans are necessary.

Statement of Timber Used:

	<u>Lineal Feet</u>		<u>Average Price per Foot</u>		<u>Amount</u>	<u>Amount</u>
	<u>1949</u>	<u>1948</u>	<u>1949</u>	<u>1948</u>	<u>1949</u>	<u>1948</u>
8" Stulls	20,894	21,008	.1376	.1167	2,874.96	2,451.31
10" Stulls	29,038	31,604	.1832	.1812	5,321.02	5,728.07
12" Stulls	16,580	18,635	.2429	.2237	4,027.68	4,167.73
14" and Over	<u>2,836</u>	<u>5,885</u>	<u>.2939</u>	<u>.2846</u>	<u>833.54</u>	<u>1,674.68</u>
Total	69,348	77,132	.1883	.1818	13,057.20	14,021.79
Hardwood Cribbing	2,010	8,890	.0440	.0423	88.44	375.90
6" Cribbing	23,502	35,702	.0690	.0661	1,621.08	2,360.87
Lagging - 7'	667,610	632,940	.0167	.0153	11,149.09	9,709.96
Poles - 9½'	<u>221,873</u>	<u>224,864</u>	<u>.0293</u>	<u>.0269</u>	<u>6,496.13</u>	<u>6,047.66</u>
Total	914,995	902,396	.0212	.0205	19,354.74	18,494.39
Grand Total					32,411.94	32,516.18

	<u>1949</u>	<u>1948</u>
Product	434,210	491,817
Feet of timber per ton of ore	.160	.157
Feet of cribbing per ton of ore	.059	.091
Feet of lagging per ton of ore	1.538	1.287
Feet of poles per ton of ore	.51	.46
Cost per ton for timber	.0301	.0285
Cost per ton for cribbing	.0039	.0056
Cost per ton for lagging	.0257	.0197
Cost per ton for poles	.0149	.0123
Total cost per ton	<u>.0746</u>	<u>.0661</u>

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7. UNDERGROUND: (CONT'D)

e. Drifting and Raising:

A direct comparison by years as to the amounts of drifting and raising in rock and ore has been given under the "b. Development" heading.

f. Explosives, Drilling and Blasting:

The increase in the cost of powder as well as the amount of powder per ton of ore was due to a larger amount of drifting and raising. The cost of powder also increased an average of forty-seven cents per hundred pounds.

Year	Cost per Lb. for Powder	Lbs. Powder per Ton of Ore	Cost per Ton for Powder	Cost per Ton Fuse & Caps	Cost per Ton Total
1949	.1452	.4223	.0613	.0145	.0758
1948	.1405	.3843	.0539	.0117	.0656

Statement of Explosives Used: (Ore Development and Stopping):

	Quantity	Average Price	Amount 1949	Amount 1948
Gelamite #1 - Lbs.	1,500	15.26	228.85	1,823.26
Hercomite #2X - Lbs.	181,885	14.51	26,388.83	24,704.50
Total Powder	183,385	14.51	26,617.68	26,527.76
Primacord - Feet	1,500	32.00	48.00	243.20
Tamptite Shells	-	-	-	33.55
Fuse - Feet	582,715	8.29	4,833.27	4,231.95
Caps - #6	73,105	15.19	1,110.17	898.90
Fuse Lighters-Hot Wire	27,500	9.00	247.56	254.24
Fuse Lighters-Master	-	-	-	9.93
Detonators-Electric	229	17.50	40.08	53.96
Total Fuse, Etc.			6,279.08	5,725.73
Total All Explosives Stopping, Etc.			32,896.76	32,253.49

Product	1949	1948
Pounds of powder per ton of ore	434,210	491,817
Cost per ton for powder	.4223	.3843
Cost per ton for fuse, caps, etc.	.0613	.0539
Cost per ton for all explosives	.0145	.0117
	.0758	.0656

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

	Quantity	Average Price	Amount 1949	Amount 1948
Gelamite #1 - Lbs.	1,300	15.24	198.16	1,312.76
Hercomite #2X - Lbs.	7,200	14.50	1,044.00	1,741.13
60% Gelatin - Lbs.				269.59
Total Powder	8,500	14.61	1,242.16	3,323.48
Fuse - Feet	24,245	8.13	197.04	295.36
Caps - #6	2,900	14.70	42.63	63.01
Lead Wire - Feet				22.75
Primacord - Feet				64.00
Detonators - Electric	51	17.51	8.93	446.92
Total Fuse, Etc.			248.60	892.04
Total All Explosives Rock Development, Etc.			1,490.76	4,215.52
Total All Explosives Used in Mine			34,387.52	36,469.01
Average Price per Pound for Powder			.1452	.1405
Charged to Telephones & Safety Devices			23.04	-
Charged to Pumping Machinery			-	239.67
Charged to Exploring in Mine			-	205.62
Total as per Cost Sheet			34,410.56	36,914.30
Charged to E.&A.#CC-278(Uncompleted Constr.)			1,991.24	-
Grand Total			36,401.80	36,914.30

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7. UNDERGROUND: (CONT'D)

g. Mining and Loading:

Throughout 1949 two systems of mining were used exclusively, namely, sublevel caving and sublevel stoping. These methods, in general, had proved satisfactory. During 1949 approximately 16% of the total production was derived from stoping operations, the remaining 84% from sublevel caving. The individual mining contract production showed an overall output of 18.8 cars of ore per shift during caving operations, compared with 18.3 cars per shift in 1948.

With reference to loading and in particular from raises to the tram-cars the general trend has been toward top-timber transfers, reducing the amount of raising from the level in developing various orebodies. During the year a number of these top-timber transfers were in use. Our experience has shown that this type of loading is somewhat slower than from raises. This condition is further accentuated at the Cambria-Jackson Mine where most of the loading is carried on in a single main-level drift, in place of crosscuts which are normally used in larger orebodies. In other words, one motor-train is often delayed by another which is loading ahead. It is hoped that the new 8th Level can be laid out and developed with several short crosscuts to overcome this condition.

h. VENTILATION:

All ventilation drifts and raises were maintained throughout the year. The ventilation in general has been very good, although in several areas the excessive ground pressure has reduced the size of openings with the result that continuous maintenance and repair has been necessary.

Near the end of the year it was suggested that the present ventilation system be completely reversed so that all exhaust air would enter the inactive 6th Level and go up the shaft from there. This would require several permanent changes which will be made during the coming year.

i. PUMPING:

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

<u>Month</u>	<u>1949</u>	<u>1948</u>	<u>1947</u>	<u>1946</u>	<u>1945</u>	<u>1944</u>	<u>1943</u>	<u>1942</u>
January	289	313	281	285	317	333	369	413
February	278	315	294	293	284	285	340	387
March	254	287	279	309	315	328	335	375
April	315	345	319	396	456	344	433	430
May	363	410	538	362	460	425	619	477
June	341	362	471	314	453	389	620	465
July	337	358	460	308	439	378	583	421
August	395	335	376	289	374	347	411	379
September	375	312	359	272	341	410	395	362
October	355	299	343	255	315	408	402	391
November	333	276	323	250	299	423	340	394
December	305	293	323	276	292	397	340	386
Avg.G.P.M.	328	325	364	301	362	372	432	407

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

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YEAR 1949

8. COST OF OPERATING:

a. Comparative Mining Costs:

	<u>1949</u>	<u>1948</u>	<u>Increase</u>	<u>Decrease</u>		
Product	434,210	491,817	-	57,607		
Underground Costs	1.806	1.733	.073	-		
Surface Costs	.233	.263	-	.030		
General Mine Expenses	.372	.335	.037	-		
Cost of Production	2.411	2.331	.080	-		
Taxes	.200	.159	.041	-		
Depletion & Depreciation	.084	.196	-	.112		
Loading & Shipping	.043	.049	-	.006		
Total Cost	2.738	2.735	.003	-		
No. of Days Operated	245	286	-	41		
Tot. No. of Shifts Operated	490	560	-	70		
Average Daily Product	1,772	1,756	16	-		
<u>Total Cost at Mine:</u>						
	<u>1949</u>	<u>Percent</u>	<u>1948</u>	<u>Percent</u>	<u>Increase</u>	<u>Decrease</u>
Labor	1.760	64.3	1.737	63.5	.023	-
Supplies	.978	35.7	.998	36.5	-	.020
Total	2.738	100.0	2.735	100.0	.003	-

b. Detailed Cost Comparison:

(1) Days and Shifts:

<u>Year</u>	<u>Days Mine Worked</u>	<u>Shifts & Hours</u>	<u>Men Employed</u>	<u>Total Shifts</u>
1949	245	490 - 8 Hr.	222	55,029
1948	286	560 - 8 Hr.	224	64,582
Decrease	41	70	2	9,553

(2) Wages:

There was no increase granted in wages during 1949.

(3) Comparison of Production:

<u>Year</u>	<u>Tons</u>
1949	434,210
1948	491,817
Decrease	57,607

(4) Comparison of Number of Men and Wages:

<u>Year</u>	<u>No. of Men</u>	<u>No. of Days</u>	<u>Amount</u>	<u>Rate per Day</u>
1949	222	55,029	718,543.51	13.06
1948	224	64,582	804,859.97	12.46
Increase	-	-	-	.60
Decrease	2	9,553	86,316.46	-

(5) Tons per Man per Day:

	<u>1949</u>	<u>1948</u>	<u>Increase</u>
Surface	34.68	31.94	2.74
Underground	10.21	10.00	.21
Total	7.89	7.62	.27

(6) Cost of Production:

	<u>1949</u>	<u>1948</u>	<u>Increase</u>	<u>Decrease</u>
Amount	1,046,968.20	1,146,581.56	-	99,613.36
Cost per Ton	2.411	2.331	.080	-
<u>Year</u>	<u>Labor</u>	<u>Percent</u>	<u>Supplies</u>	<u>Percent</u>
1949	753,706.44	72.0	293,261.76	28.0
1948	839,231.30	73.2	307,350.26	26.8
Increase	-	-	-	1.2
Decrease	85,524.86	1.2	14,088.50	-

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

	<u>1949</u>		<u>1948</u>	
Days per Week	6 to 6-27-49		6	
Shifts and Hours	5 July, Aug., Sept., Nov. & Dec.		1-8 12	
	2-8 245		2-8 274	
Production, Tons	434,210		491,817	
Average Daily Production, Tons	1,772		1,756	
Number of Days Worked	245		286	
<u>UNDERGROUND COSTS:</u>				
	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>
1. Exploring in Mine	1,905.86	.004	14,543.47	.030
3. Development in Rock	14,875.22	.034	30,271.22	.062
4. Development in Ore	37,996.69	.088	5,461.59	.011
5. Stopping	277,637.22	.640	318,728.30	.648
6. Timbering	180,282.85	.415	200,080.42	.407
7. Traming	129,816.34	.299	135,258.05	.275
8. Ventilation	5,571.70	.013	5,085.59	.010
9. Pumping	29,154.04	.067	30,861.92	.063
10. Compressors and Air Pipes	35,306.79	.081	32,488.74	.066
12. Underground Superintendence	22,134.05	.051	27,908.20	.056
13. Cave-in, or Fire in Mine	200.13	.001	61.16	-
14. Maint.: Comp. & Power Drills	1,622.19	.004	4,137.44	.008
15. Scrapers & Mech. Loaders	27,885.25	.064	24,531.85	.050
16. Traming Equipment	17,120.10	.039	18,452.32	.038
17. Pumping Machinery	2,626.22	.006	4,324.17	.009
Total Underground Costs	<u>784,134.65</u>	<u>1.806</u>	<u>852,194.44</u>	<u>1.733</u>
<u>SURFACE COSTS:</u>				
18. Hoisting	30,783.61	.071	33,671.97	.068
19. Stocking Ore	13,500.73	.031	12,577.06	.026
21. Dry House	11,403.14	.026	9,460.70	.019
22. General Surface Expense	16,611.61	.038	22,651.24	.046
23. Maint.: Hoisting Equipment	16,053.98	.037	18,458.47	.038
24. Shaft	4,467.03	.010	14,879.72	.030
25. Top Tram Equipment	2,852.78	.007	6,582.15	.013
26. Docks, Trestles & Pockets	-	-	1,707.34	.004
27. Mine Buildings	5,351.76	.013	9,537.82	.019
Total Surface Costs	<u>101,024.64</u>	<u>.233</u>	<u>129,526.47</u>	<u>.263</u>
<u>GENERAL MINE EXPENSES:</u>				
28. Geological	1,033.83	.002	1,426.46	.003
29. Mining Engineering	7,049.37	.016	4,654.28	.010
30. Mech. & Electr. Engineering	4,930.28	.011	4,161.31	.008
31. Analysis and Grading	14,367.31	.033	16,975.14	.035
32. Safety Department	2,186.14	.005	2,328.17	.005
33. Telephones and Safety Devices	4,303.33	.010	4,790.65	.010
34. Local and General Welfare	2,772.03	.006	3,189.01	.006
35. Spec. Exp., Pensions & Allowances	6,730.86	.016	5,983.24	.012
36. Ishpeming Office	14,863.07	.034	20,860.02	.042
37. Mine Office	23,895.85	.055	25,141.96	.051
38. Insurance	17,154.03	.040	12,876.80	.026
39. Personal Injury	18,860.53	.044	18,005.90	.037
40. Social Security Taxes	16,127.87	.037	15,951.40	.032
41. Employees' Vacation Pay	27,503.92	.063	28,516.31	.058
Research Laboratory	30.49	-	-	-
Total General Mine Expenses	<u>161,808.91</u>	<u>.372</u>	<u>164,860.65</u>	<u>.335</u>
COST OF PRODUCTION	1,046,968.20	2.411	1,146,581.56	2.331

CAMBRIA-JACKSON MINE
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8. COST OF OPERATING: (CONT'D)

b. Detailed Cost Comparison: (Cont'd)

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

UNDERGROUND COSTS:

1. Exploring in Mine:

The decrease in the cost per ton is due to the fact that there was less borts drilling.

3. Development in Rock:

The decrease in the cost per ton is due to the fact that in 1949 the major part of the development footage comprised small rock raises and drifts, while in 1948 the footage included a considerable amount of main level rock drifting.

4. Development in Ore:

The increase in the cost per ton is due to the fact that there was more development footage.

5. Stoping:

The decrease in the cost per ton is due to the fact that a greater proportion of the product was derived from stoping operations.

6. Timbering:

The increase in the cost per ton is due to the fact that there was an increase in the price of timber used.

7. Tramming:

The increase in the cost per ton is due to the fact that there was a smaller production.

8. Ventilation:

The increase in the cost per ton is due to the fact that there was a smaller production.

9. Pumping:

The increase in the cost per ton is due to the fact that there was a smaller production.

<u>Year</u>	<u>Total Gallons Pumped</u>	<u>Gallons per Minute</u>
1949	173,343,402	328
1948	171,964,375	325

10. Compressors and Air Pipes:

The increase in the cost per ton is due to the fact that there was more pipemen labor.

<u>Year</u>	<u>Cubic Feet of Air Compressed</u>
1949	508,049,000
1948	521,350,500

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8. COST OF OPERATING: (CONT'D)

b. Detailed Cost Comparison: (Cont'd)

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

UNDERGROUND COSTS: (CONT'D)

12. Underground Superintendence:

The decrease in the cost per ton is due to the fact that underground foremen received a reduction in salary on July 1st, 1949.

14. Compressors and Power Drills:

The decrease in the cost per ton is due to the fact that there was less equipment purchased. Four L-29 pickhamers 620.00, and compressor parts 350.73, were charged out.

15. Scrapers and Mechanical Loaders:

The increase in the cost per ton is due to the fact that additional equipment was purchased. Two used scraper hoists 600.00, scraper hoist parts 1,908.00, and 56,774 feet of scraper rope 7,890.86, were charged out.

16. Tramming Equipment:

Charges to this account approximately the same in 1949 as in 1948.

17. Pumping Machinery:

The decrease in the cost per ton is due to the fact that there was no new equipment purchased. Pump parts 710.52, were charged out.

SURFACE COSTS:

18. Hoisting:

Increase due to smaller production.

19. Stocking Ore:

Increase due to smaller production.

21. Dry House:

The increase in the cost per ton is due to the fact that additional equipment was purchased. Water tank 444.53, copper pipe and fittings 301.64, regulator 122.20, coil 61.32, pump 53.77, and Thermolier motors 50.29, were charged out.

22. General Surface Expense:

Decrease due to less charges for surface improvements than in the previous year.

23. Hoisting Equipment:

Charges to this account approximately the same in 1949 as in 1948. Two hoisting ropes 2,960.33, sheave liners and bolts 424.56, and repairs to skip-cage hoist 146.46, were charged out.

CAMBRIA-JACKSON MINE
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YEAR 1949

8. COST OF OPERATING: (CONT'D)

b. Detailed Cost Comparison: (Cont'd)

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

SURFACE COSTS: (CONT'D)

24. Shaft:

Less repairs during the year.

25. Top Tram Equipment:

Less repairs during the year. Worms and wormwheels for larry-cars 298.74, were charged out.

26. Docks, Trestles and Pockets:

No charges to this account during the year.

27. Mine Buildings:

Decrease due to less expenditures for building construction and repairs. Shafthouse painting 969.50, office plumbing 401.44, "I" beams for shop building 165.40, larry-car barn roofing 70.20, were charged out.

GENERAL MINE EXPENSES:

28. Geological:

Less expense on account of a decrease in bortz drilling.

29. Mining Engineering:

Increase due to 8th level planning and conveyor drift development.

30. Mechanical and Electrical Engineering:

Increase due to changes in engine house.

31. Analysis and Grading:

The cost to this account is made up as follows:

Year	Sampling at Mine	Central Laboratory	Shipping Dept. Expense	Trucking Samples, Etc.	Total
1949	1,082.08	9,883.63	2,247.06	1,154.54	14,367.31
1948	620.37	12,996.40	2,338.91	1,019.46	16,975.14
Increase	461.71	-	-	135.08	-
Decrease	-	3,112.77	91.85	-	2,607.83

35. Special Expenses, Pensions and Allowances:

The cost to this account is made up as follows:

Year	Retirements	Employment Office	Legal	Pensions	Examinations	Total
1949	4,967.30	1,170.21	320.83	262.61	9.91	6,730.86
1948	4,106.04	774.24	357.11	332.31	413.54	5,983.24
Increase	861.26	395.97	-	-	-	747.62
Decrease	-	-	36.28	69.70	403.63	-

CAMBRIA-JACKSON MINE
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8. COST OF OPERATING: (CONT'D)

b. Detailed Cost Comparison: (Cont'd)

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

GENERAL MINE EXPENSES: (CONT'D)

36. Ishpeming Office:

<u>Year</u>	<u>Amount</u>	<u>Cost per Ton</u>
1949	14,863.07	.034
1948	20,860.02	.042

37. Mine Office:

The detail of charges to this account were as follows:

<u>Year</u>	<u>Salaries Supt. & Clerks</u>	<u>Central Warehouse</u>	<u>Misc.</u>	<u>Total</u>
1949	17,492.68	4,648.55	1,754.62	23,895.85
1948	18,749.81	4,556.14	1,836.01	25,141.96
Increase	-	92.41	-	-
Decrease	1,257.13	-	81.39	1,246.11

38. Insurance:

This account is made up as follows:

<u>Year</u>	<u>Property Insurance</u>	<u>Group Health & Life</u>	<u>Group Annuity</u>	<u>Catastrophe Insurance</u>	<u>Total</u>
1949	1,317.61	9,395.45	6,039.36	401.61	17,154.03
1948	2,235.97	10,216.22	-	424.61	12,876.80
Increase	-	-	6,039.36	-	4,277.23
Decrease	918.36	820.77	-	23.00	-

39. Personal Injury:

The detail of charges to this account were as follows:

<u>Year</u>	<u>Compensation & Doctors</u>	<u>Compensation Department</u>	<u>Total</u>
1949	17,950.69	909.84	18,860.53
1948	17,116.20	889.70	18,005.90
Increase	834.49	20.14	854.63

40. Social Security Taxes:

<u>Year</u>	<u>Unemployment Tax</u>	<u>Old Age Benefit Tax</u>	<u>Total</u>
1949	9,039.34	7,088.53	16,127.87
1948	9,015.69	6,935.71	15,951.40
Increase	23.65	152.82	176.47

41. Employees' Vacation Pay:

<u>Year</u>	<u>Amount</u>	<u>Cost per Ton</u>
1949	27,503.92	.063
1948	28,516.31	.058

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8. COST OF OPERATING: (CONT'D)

c. Cost of Idle Period (Strike):

	<u>Labor</u>	<u>Supplies</u>	<u>Total</u>
<u>UNDERGROUND COSTS:</u>			
Stopping	9.05	-	9.05
Timbering	457.50	-	457.50
Ventilation	-	221.12	221.12
Pumping	1,565.48	1,843.90	3,409.38
Compressors and Air Pipes	495.34	-	495.34
Underground Superintendence	4,408.50	18.03	4,426.53
Maint.: Scrapers & Mechanical Loaders	14.06	-	14.06
	<hr/>	<hr/>	<hr/>
Total Underground Costs	6,949.93	2,083.05	9,032.98
<u>SURFACE COSTS:</u>			
Hoisting	1,076.30	536.54	1,612.84
Dry House	319.72	153.06	472.78
General Surface Expense	1,929.82	259.95	2,189.77
	<hr/>	<hr/>	<hr/>
Total Surface Costs	3,325.84	949.55	4,275.39
<u>GENERAL MINE EXPENSES:</u>			
Geological	184.32	99.00	283.32
Mining Engineering	577.43	121.50	698.93
Mechanical & Electrical Engineering	595.57	165.00	760.57
Analysis and Grading	745.83	182.67	928.50
Safety Department	263.34	40.33	303.67
Telephones and Safety Devices	-	53.87	53.87
Local and General Welfare	150.40	158.46	308.86
Special Expense, Pensions & Allowances	116.32	779.68	896.00
Ishpeming Office	1,331.70	950.77	2,282.47
Mine Office	2,589.13	423.99	3,013.12
Insurance	-	2,072.61	2,072.61
Personal Injury	111.42	433.45	544.87
Social Security Taxes	-	113.28	113.28
Employees' Vacation Pay	4,055.00	-	4,055.00
	<hr/>	<hr/>	<hr/>
Total General Mine Expenses	10,720.46	5,594.61	16,315.07
COST OF PRODUCTION	20,996.23	8,627.21	29,623.44
<u>DEPLETION, DEPRECIATION AND TAXES:</u>			
Depreciation - Movable Equipment	-	69.00	69.00
Taxes	-	12,400.00	12,400.00
	<hr/>	<hr/>	<hr/>
Total Depl'n, Depr'n & Taxes	-	12,469.00	12,469.00
TOTAL COST AT MINE AND TOTAL COST	<hr/>	<hr/>	<hr/>
	20,996.23	21,096.21	42,092.44

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9. EXPLORATIONS AND
FUTURE EXPLORATIONS:

Diamond drilling explorations were continued into the first quarter of 1949 and concluded near the middle of March. Five holes were drilled in the west end of the central deposit from a point approximately 50 feet above the 7th Level. These holes explored the orebody below the level elevation in an effort to give sufficient information to lay out the development work as well as information as to the amount and extent of the deposit. According to the diamond-drill holes all the remaining ore in the Jackson Strip is located within ninety feet of the present active 7th Level. To the west a portion of the development will be in ore which pinches out between the slate footwall and an east-west dike. The central and eastern deposit lie entirely above the proposed level elevation. It was this information that determined the use of a conveyor to elevate the 8th level ore to a 7th level pocket.

Diamond Drill Holes No. 192, No. 193, No. 194, No. 195 and No. 196 were all drilled from a drift on the -50-foot sublevel which was located in the west portion of the central deposit. It was necessary to use this drift, which is approximately 50 feet above the 7th Level, because it was the farthest point to the south where drilling could be done without driving a rock drift on the level.

A complete log of the above-mentioned holes is reported below, and for the most part showed only short runs of ore interbedded with jasper and lean ore and dike.

Logs of Holes Drilled:

<u>D.D.Hole No.</u>	<u>Location</u>	<u>Dip</u>	<u>Elev.</u>	<u>Course</u>	<u>Footage</u>	<u>Material</u>
192 (Started 12-30-48, Stopped 1-10-49.)	-50' Sub	-59°	-51.9'	S2°32'W	0 to 20	Lean Ore
					20 to 42	High-Sulphur Ore
					42 to 146	Soft Ore Jasper
					146 to 155	Dike
					155 to 208	Soft Ore Jasper
193 (Started 1-12-49, Stopped 1-18-49.)	-50' Sub	-41°30'	-52.6'	N1°26'W	0 to 49	High-Sulphur Ore
					49 to 71	Dike
					71 to 112	Soft Ore Jasper
					112 to 120	Trans. Jasp. & Slate
					120 to 130	Lean Ore
194 (Started 1-19-49, Stopped 1-26-49.)	-50' Sub	-90°	-52.6'	-	130 to 159	Trans. Jasp. & Slate
					0 to 10	Lean Ore
					10 to 47	High-Sulphur Ore
					47 to 114	Soft Ore Jasper
					114 to 166	Trans. Jasp. & Slate
195 (Started 2-14-49, Stopped 2-22-49.)	-50' Sub	-88°	-50'	-	166 to 168	Slate
					0 to 30	Ore
					30 to 35	Dike
					35 to 38	Ore
					38 to 52	Dike
					52 to 96	Ore
					96 to 107	Jasper
					107 to 141	Ore
					141 to 154	Lean Ore
					154 to 170	Ore
196 (Started 2-25-49, Stopped 3-14-49.)	-50' Sub	-60°	-50'	South	170 to 175	Lean Ore
					0 to 17	Dike
					17 to 23	Soft Ore Jasper
					23 to 30	Lean Ore
					30 to 66	Soft Ore Jasper
					66 to 76	High-Sulphur Ore
					76 to 100	Ore
					100 to 121	Soft Ore Jasper
121 to 144	Dike					
144 to 152	Soft Ore Jasper					
152 to 167	Lean Ore					
167 to 180	Soft Ore Jasper					
180 to 183	Lean Ore					

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9. EXPLORATIONS AND FUTURE EXPLORATIONS: (CONT'D)

With reference to future explorations, at the present time none are anticipated. There is a possibility, however, that if additional ore is found on or above the 8th Level some additional drilling may be necessary.

10. <u>TAXES:</u>	<u>1949</u>		<u>1948</u>	
	<u>Valuation</u>	<u>Taxes</u>	<u>Valuation</u>	<u>Taxes</u>
<u>Cambria Realty:</u>				
S $\frac{1}{2}$ of SE $\frac{1}{4}$ of Sec. 35, 48-27)				
Lots 7 & 8 of Sec. 35, 48-27)				
Lots 5,6 & 7 of Sec. 36, 48-27)				
- 222.09 Acres)	200,000	10,472.86	125,000	5,539.41
<u>Jackson Strip:</u>				
N660' of N $\frac{1}{2}$ of NW $\frac{1}{4}$ of Sec. 1,)				
47-27 - 40 Acres)	1,035,000	54,197.05	930,000	41,213.23
<u>Personal Property:</u>				
Stockpile, Supplies & Equipment	570,000	29,847.65	620,000	27,475.49
Tot. by Mich. State Tax Com.	1,805,000	94,517.56	1,675,000	74,228.13
Lillie Mine Loc., 1 House-Lot 5			100	4.43
Total	1,805,000	94,517.56	1,675,100	74,232.56
Collection Fees		945.18		742.33
Total Taxes, Negaunee		95,462.74		74,974.89
<u>Division of Payments:</u>				
Cambria-Jackson Taxes, Ishpeming*	100,000	3,730.14	75,000	2,980.08
Cambria-Jackson Taxes, Negaunee	1,805,000	95,462.74	1,675,100	74,974.89
TOTAL	1,905,000	99,192.88	1,750,100	77,954.97
<u>*Cambria-Jackson Mine-Ishpeming:</u>				
N660' of NE $\frac{1}{4}$ of NE $\frac{1}{4}$ of Sec. 2,)				
47-27 - 20 Acres)				
<u>Tax Rate per \$100 of Valuation:</u>				
City of Negaunee		<u>1949</u>		<u>1948</u>
		5.23643		4.43153
City of Ishpeming		3.73014		3.97344
Total Taxes, City of Negaunee:		720,387.61		512,641.46
<u>Cambria-Jackson Percent of Taxes:</u>				
City of Negaunee		13.12		14.48

11. ACCIDENTS AND PERSONAL INJURY:

There was a considerable improvement in the total number of lost-time accidents reported during the year 1949. Despite the six-weeks' strike period the total number is considerably less. There were no fatal accidents during the year and only one injury resulted in a lost-time period in excess of four months.

The following is a list of the number of compensable accidents classified as lost-time, where seven or more calendar days were lost:

	<u>1949</u>	<u>1948</u>
Fatal	0	1
Time lost - over 4 months	1	1
Time lost - 1 to 4 months	5	5
Time lost - less than 1 month	5	9
Total Compensable Accidents	<u>11</u>	<u>16</u>

On December 31, 1949, payments were being made on four accidents which occurred prior to January 1, 1949. Two are death claims and two are receiving full compensation.

<u>No.</u>	<u>Date</u>	<u>Name</u>	<u>Injury</u>	<u>Days Lost</u>
75	1-25-49	Rolland J. Toms	Infected finger	16
76	2-23-49	Arnie Mitchell	Fracture, left great toe	27
77	3-23-49	Joseph Scoleri	Fracture, right foot	130
78	4-14-49	Nick Dallas	Severe contusion, back	50
79	4-27-49	Francis Conway	Laceration, nose	11
80	5-27-49	Russell Johnson	Foreign body, left eye	16
81	9-30-49	Theodore Maki	Sprain, right knee	37
82	11-23-49	John Paavola	Cut, above right knee	11
83	12-5-49	Charles Nelson	Laceration, forehead	12
84	11-29-49	Mikka Hokkanen	Strain, back	Home
85	12-27-49	John Savala	Amputation, right great toe	Home

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11. ACCIDENTS AND
PERSONAL INJURY: (CONT'D)

In addition John Hill was accepted as an occupational disease case, and settlements were made with James Adamini and John Tanila under the Occupational Disease Law.

12. NEW CONSTRUCTION AND
PROPOSED NEW CONSTRUCTION:

There was very little new construction carried on during the year. This subject has been covered under the heading, "6. SURFACE:".

All present buildings are, in general, in good shape and outside of the usual repair and maintenance no new construction is anticipated.

13. EQUIPMENT AND
PROPOSED EQUIPMENT:

a. Hydrocrane:

The Bucyrus-Erie hydrocrane, which was purchased in August, 1948 under E. & A. No. CC-267, was in operation during the entire year. Its performance has been very satisfactory and a tremendous saving has resulted in labor charges on surface. The hydrocrane has frequently been used by other mines on jobs where additional labor has been saved.

b. Shaft Hoist:

In December, 1948 E. & A. No. CC-201 was issued to cover the replacement of the original 400-H.P. skip-hoist motor with a 700-H.P. motor which had been in service a number of years at the Maas Mine. Prior to the changeover a new pinion and shaft was purchased to correct the speed differential in the larger motor. After considerable work in preparation for this move, the changeover took place during vacation week in August. The new pinion and shaft were installed and the pillow-block bearings were rebabbited. The new motor was moved into place, and after making a number of final adjustments and trial runs, the mine resumed operation on August 23rd.

The listing below shows the expenditures compared with the authorized amounts for E. & A. No. CC-201. It should be mentioned that the original authorization covered only the cost of installation and other necessary contingencies. It did not include the depreciated value of the motor from the Maas Mine. However, this amount of \$13,870.41 has been shown in the tabulation. Thus, the original amount of \$8,000.00 was overdrawn by \$11,183.63.

STATEMENT SHOWING EXPENDITURES E.&A. NO. CC-201
SKIP-CAGE HOIST MOTOR

	<u>Amt. Authorized</u>	<u>Expended</u>	<u>Unexpended</u>
Induction hoist motor & control	2,500.00	13,870.41	11,370.41
Foundations for equipment	500.00	633.06	133.06
Pinion	1,000.00	990.77	9.23
Labor, trucking, etc.	3,000.00	2,985.37	14.63
Contingencies	1,000.00	632.87	367.13
Social security taxes	-	71.15	71.15
Total	8,000.00	19,183.63	11,183.63

c. Underground Conveyor:

In November, 1948, E. & A. No. CC-278 was authorized for the expenditure of \$180,000.00 to cover the cost of driving a 600-foot incline drift, constructing pockets at the upper and lower ends and installing a conveyor, apron feeder and supply hoist. The actual work was delayed for some time to complete diamond-drilling operations which were in progress to determine the actual depth of the

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13. EQUIPMENT AND PROPOSED EQUIPMENT: (CONT'D)

c. Underground Conveyor: (Cont'd)

ore below the 7th Level. Work started on the pockets and supply drift early in 1949 and by the end of the year the entire upper end was completed, together with the installation of 236 feet of conveyor and 255 feet of steel-supported drift. The table below is a progress report of the expenditures which indicate that \$79,022.39 has been expended through December 31st, 1949, leaving \$100,977.61 as an unexpended balance. At the present writing there is no question but what the E. & A. will be completed within the estimated figure, although several items in the distribution show and will continue to show an overexpended amount. It is estimated that the complete conveyor system will be finished in October, 1950.

STATEMENT SHOWING EXPENDITURES E.&A. NO. CC-278
DEVELOPMENT BELOW 7TH LEVEL

	Amount Authorized	Expended	Unexpended
<u>Equipment and Installation:</u>			
Conveyor complete	80,000.00	28,749.13	51,250.87
Apron feeder	20,000.00	10,868.99	9,131.01
Supply hoist for incline	10,000.00	292.58	9,707.42
<u>Drifting and Excavation:</u>			
Equipment	7,500.00	4,797.70	2,700.30
Pockets - 7th level	8,000.00	9,379.58	1,379.58
Storage drift - 7th level	3,500.00	4,412.49	912.49
Storage drift - 8th level	5,250.00	-	5,250.00
Tail room - 7th level	2,000.00	2,734.09	734.09
Belt incline (small)	8,750.00	4,537.35	4,212.65
Belt incline (large)	36,000.00	12,749.82	23,250.18
Social security taxes	-	500.66	500.66
Total	180,000.00	79,022.39	100,977.61

d. Scraper Hoists:

There were no new scraper hoists purchased during 1949. Two 15-H.P. Sullivan hoists were purchased from the Princeton Mine equipment account and one 25-H.P. single-drum Sullivan supply hoist was purchased from the Isle Royal Copper Company for use in the conveyor incline.

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

Company	1949			1948	
	Total Machines	Total	Avg. Cost	Total	Avg. Cost
		Machines Repaired	of Ea. Mach. Repaired	Machines Repaired	of Ea. Mach. Repaired
Ing.-Rand 15-H.P.Elec.	17	1	1,218.54	4	260.32
Ing.-Rand 20-H.P.Elec.	2	1	411.53	4	174.28
Ing.-Rand 25-H.P.Elec.	2	-	-	-	-
Ing.-Rand Air Hoists	2	-	-	-	-
Sullivan 15-H.P.Elec.	17	4	185.14	-	-
Sullivan 25-H.P.Elec.	7	-	-	2	236.42
Total	47	6	2,370.62	10	2,211.20

e. Underground Tram-Cars:

During the year five used 65 cubic-foot rocker-dump cars were purchased from the Negaunee Mine. The car-bunks were overhauled, reducing the wheel gauge from 30 inches to 24 inches. Two of the car-boxes were used as tanks for the small plant treating hardwood plank for use as backlath in the underground conveyor drift. At the present time there are twenty-nine rocker-dump cars in use underground and two on surface.

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13. EQUIPMENT AND
PROPOSED EQUIPMENT: (CONT'D)

f. Skips and Cages:

There were no changes in the skips and cages during the year. Periodic changes of the skips and cages were made when necessary. Particular care was taken to balance the skips and cages as much as possible to allow a more even and smooth operation of the main hoist.

g. Haulage Tracks:

The following is a comparison of costs of materials for haulage tracks for 1949 and 1948:

	<u>1949</u>	<u>1948</u>
60-Lb. Rail	227.34	-
40-Lb. Rail	51.92	363.93
Ties and Tie Plates	<u>30.68</u>	<u>156.46</u>
Total	309.94	520.39

h. Mine Trucks:

The 1947 Chevrolet 1-1/2-ton truck operated satisfactorily throughout the year. No major repairs were necessary. The Dodge truck, which was purchased second-hand in 1943, was also in continuous use and during the year it was necessary to replace the motor and make other minor repairs.

14. MAINTENANCE
AND REPAIRS:

The maintenance and repair costs listed under "Underground Costs" were as follows:

	<u>1949</u>		<u>1948</u>	
	Amount	Cost per Ton	Amount	Cost per Ton
Compressors & Power Drills	1,622.19	.004	4,137.44	.008
Scraper Equipment	27,885.25	.064	24,531.85	.050
Electric Tram Equipment	17,120.10	.039	18,452.32	.038
Pumping Machinery	<u>2,626.22</u>	<u>.006</u>	<u>4,324.17</u>	<u>.009</u>
Total	49,253.76	.113	51,445.78	.105

The following is a list of purchases and repair costs for 1949, as compared with 1948:

	<u>1949</u>	<u>1948</u>
Sheave liners and bolts	424.56	
2 Hoisting ropes	2,960.33	
Air compressor	325.50	
Compressor parts	350.73	
2 Used scraper hoists from Princeton Mine	600.00	
Scraper hoist parts	1,908.00	
Guyan welder	173.00	
5 Used tram-cars from Negaunee Mine	635.00	
Prescott pump parts	710.52	
Dry water-tank	444.53	
B&G circulating pump for dry	53.77	
Powers regulator for dry	122.20	
Coil for dry	61.32	
Copper pipe and fittings	301.64	
2 Thermolier fan motors	50.29	
Lawn mower	23.95	
Repairs to skip-cage hoist	146.46	
Worms and wormwheel	298.74	
4 L-29 pickhamers	620.00	
4 "I" beams	165.40	
56,774 feet scraper rope	7,890.86	
Office plumbing	401.44	
Roofing on larry-car barn	70.20	

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14. MAINTENANCE
AND REPAIRS: (CONT'D)

	<u>1949</u>	<u>1948</u>
Painting shafthouse	969.50	
Monroe calculator	432.00	
Truck repairs	1,126.88	
Tractor repairs	189.23	
Hydrocrane repairs	350.60	
Diesel shovel repairs	655.54	
Stoker for engine house	292.99	
Total Purchases	<u>22,755.18</u>	<u>26,661.07</u>
Repairs to Compressors & Power Drills	651.46	1,292.51
Repairs to Scraper Hoists	17,486.39	17,420.55
Repairs to Locomotives	4,226.24	3,251.11
Repairs to Trolley Wire	1,803.97	2,260.66
Repairs to Tracks	4,724.01	6,064.60
Repairs to Cars	5,319.99	3,812.79
Repairs to Pumping Machinery	1,915.70	3,272.02
Total Repairs	<u>36,127.76</u>	<u>37,374.24</u>

The maintenance and repair costs under "Surface Costs" were as follows:

	<u>1949</u>		<u>1948</u>	
	Amount	Cost per Ton	Amount	Cost per Ton
Hoisting Equipment	16,053.98	.037	18,458.47	.038
Shaft	4,467.03	.010	14,879.72	.030
Top Tram Equipment	2,852.78	.007	6,582.15	.013
Docks, Trestles & Pockets	-	-	1,707.34	.004
Mine Buildings	<u>5,351.76</u>	<u>.012</u>	<u>9,537.82</u>	<u>.019</u>
Total	<u>28,725.55</u>	<u>.066</u>	<u>51,165.50</u>	<u>.104</u>

	<u>1949</u>	<u>1948</u>
Inspection of Hoisting Ropes	590.23	801.11
Repairs to Electric Hoists	1,894.34	3,578.06
Repairs to Skips, Cages, Etc.	9,770.26	10,036.67
Repairs to Sheaves & Pulley Stands	267.80	101.53
Repairs to Shaft	4,467.03	10,373.36
Repairs to Larry Cars & Tracks	2,396.06	5,763.32
Trestle Trolley Line	157.98	818.83
Repairs to Permanent Trestles	-	1,094.85
Repairs to Pockets, Chutes, Etc.	-	376.28
Repairs to Mine Buildings	<u>4,146.66</u>	<u>8,974.41</u>
Total	<u>23,690.36</u>	<u>41,918.42</u>

15. POWER:

The following is a detail of electric current purchased in 1949 and 1948, distribution of charges to various accounts, and other data:

	<u>1949</u>	<u>Per Ton</u>	<u>1948</u>	<u>Per Ton</u>
Stopping	1,139.12	.003	846.85	.002
Tramming	460.03	.001	294.12	.001
Ventilation	3,040.40	.007	3,038.63	.006
Pumping	14,684.15	.034	13,119.98	.027
Compressors	17,637.83	.041	17,058.64	.035
Hoisting	15,650.50	.036	16,700.72	.034
Stocking Ore	279.87	.001	507.58	.001
Dry House	502.91	.001	382.75	.001
General Surface	218.28	.001	368.95	.001
Telephones & Safety Devices	1,052.58	.002	1,331.24	.003
Mine Office	159.68	-	150.17	-
Electric Haulage	9,522.40	.022	10,560.01	.021
Shops	580.29	.001	588.00	.001
Heating	-	-	64.56	-
Tractor & Truck	52.41	-	37.34	-
Loading at Pocket	27.60	-	20.70	-
Mather Mine, "B" Shaft	837.30	-	140.00	-
Total	<u>65,845.35</u>	<u>.150</u>	<u>65,210.24</u>	<u>.133</u>

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15. POWER: (CONT'D)

	<u>1949</u>	<u>1948</u>
Power charged to Idle Expense	1,066.33*	-
*Included above.		
	<u>1949</u>	<u>1948</u>
Main Line Meter - K. W.	4,395,200	4,668,800
Separate Meter Readings	4,395,200	4,668,800
Line Loss - K. W.	-0-	-0-
Product - Tons	434,210	491,817
K.W. per Ton (Inc. Line Loss)	10.12	9.49
Cost per K. W. (Average)	.0150	.0140
15 Min. Demand - K.W. (Average)	1,026	1,017
Average Load Factor	49%	52%

17. CONDITION

OF GROUNDS:

Several improvements were made in the general appearance of the surface grounds during the year. An area east of the present parking lot was graded and covered with top-soil, so that a lawn could be planted early in the spring of 1950. The removal of the old shop building also greatly improved the general appearance. During the coming year only minor improvements will be made where necessary.

18. NATIONALITY

OF EMPLOYEES:

<u>As to Parentage:</u>	<u>1949</u>	<u>Percent</u>	<u>1948</u>	<u>Percent</u>
Finnish	82	36.0	80	35.1
Italian	40	17.5	39	17.1
English	39	17.1	38	16.7
Swedish	27	11.9	31	13.6
French (France)	11	4.8	12	5.3
French (Canadian)	9	4.0	8	3.5
Danish	6	2.6	6	2.6
German	4	1.8	4	1.8
Irish	3	1.3	3	1.3
Norwegian	3	1.3	3	1.3
Austrian	3	1.3	3	1.3
Slovanian	1	.4	1	.4
Total	228	100.0	228	100.0

<u>As to Birth:</u>	<u>American Born</u>		<u>Foreign Born</u>	
	<u>1949</u>	<u>1948</u>	<u>1949</u>	<u>1948</u>
Finnish	57	52	25	28
English	33	32	6	6
Swedish	26	29	1	2
Italian	21	20	19	19
French (France)	11	12	-	-
French (Canadian)	9	8	-	-
Danish	6	6	-	-
German	4	4	-	-
Irish	3	3	-	-
Norwegian	2	2	1	1
Austrian	1	1	2	2
Slovanian	1	1	-	-
Total	174	170	54	58
Percent	76.3%	74.6%	23.7%	25.4%

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

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1. GENERAL

The Maas Mine operated on two 8-hour shifts, six days per week from the first of the year to the last of June and then reduced to five days per week for the balance of the year, but during the latter period the mine was idle six weeks starting October 1st on account of the strike. The strike was called in connection with pensions and social welfare and was finally settled with a non-contributory pension plan and a continuance of the contributory welfare plan.

There was about a 10% turn-over in employment during the year with the total number working remaining fairly constant. Mining conditions were about normal with a few of the contracts sub-level stoping and the remainder all on sub-level caving. There was an increase from 5.93 to 6.40 tons per man per day due mostly to the abandonment of the top slicing system of mining.

The total production for the year was 603,306 tons, as compared with 673,126 tons in 1948, despite the loss of product for the six weeks idle period and a five day per week schedule from June 29th. The daily tonnage should be fairly constant at 2,300 until it is increased by block caving on the 7th Level.

The total shipments for the year were also curtailed by the strike and totaled 563,055 tons as compared with 655,351 tons in 1948. There were approximately 77,000 tons in stock at the end of shipping season as compared with 27,000 tons in 1948 and this increase was again due to the strike as all of the ore produced in November was placed on stock.

The necessary work in preparation for sinking the winze an additional 100 feet to the 7th Level was performed whenever possible during the year with actual sinking being started on September 15th. At the end of the year the winze was down 65 feet and the last set reinforced with steel and concrete to form a bearer set.

The Negaunee Mine completed mining in March and development was started on the 5th Level to mine the remainder of the ore in the Maas Area below the 14th Level. By the end of the year 15,000 tons had been mined from this pillar and the ore was of standard grade.

The water continued to be the greatest handicap and was the reason for the under-run developed, near the end of the year, in the ore in stock. Heretofore, the dry dirt dumped during the winter season more than offset the skips of wet ore that only hold one car instead of a car and a half. This year there were more of these short skips in the Maas and Race Course grade on 4th Level but as it was possible to have more full skips of special grade on the 6th Level due to the trench, the comparison in weights between the total cars and skips did not show enough discrepancy to foresee this shortage in time to prevent it by deducting a certain percentage. While the total amount of water being pumped remained fairly constant there was considerably more coming through the working places instead of along the footwall in the old drainage areas.

A much larger proportion of the ore was handled through transfer drifts, with the necessary addition of scraper men, as the very flat footwall above the 5th Level precludes the customary drifts and raises direct to the working places. Even with the transfer system there was quite an amount of rock development.

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2. PRODUCTION, SHIPMENTS & INVENTORIES

a. Production by Grades

	<u>1949</u>	<u>1948</u>
Maas	244,453	297,504
Maas Special	167,209	176,753
Race Course	47,130	55,512
Race Course Special	144,514	143,357
Total	603,306	673,126
Rock	18,640	26,660
Total Hoist	621,946	699,786

b. Shipments

<u>Grade of Ore</u>	<u>Pocket Tons</u>	<u>Stockpile Tons</u>	<u>Total Tons</u>	<u>Total Last Year</u>
Maas	106,020	122,442	228,462	316,279
Maas Special	74,708	68,723	143,431	169,114
Race Course	15,698	36,035	51,733	47,158
Race Course Special	81,595	57,834	139,429	132,800
Total	278,021	285,034	563,055	665,351
Total Last Year	347,998	317,353	665,351	
Decrease	69,977	32,319	102,296	

c. Stockpile Inventories

<u>Grade of Ore</u>	<u>12-31-49</u>	<u>12-31-48</u>
Maas	41,378	25,387
Maas Special	51,570	27,792
Race Course	9,915	14,518
Race Course Special	24,685	19,600
Total	127,548	87,297

d. Division of Product by Levels

	<u>1949</u>	<u>%</u>	<u>1948</u>	<u>%</u>
Fourth Level	195,737	32.6	179,224	26.6
Fifth Level	103,219	17.1	264,710	39.4
Sixth Level	304,350	50.3	229,192	34.0
Total	603,306	100.0	673,126	100.0

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

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2. PRODUCTION, SHIPMENTS & INVENTORIES (Cont.)

e. Production by Months

<u>Month</u>	<u>Maas</u>	<u>Maas Spcl.</u>	<u>Race Course</u>	<u>R.C. Spcl.</u>	<u>Total</u>	<u>Rock</u>
January	25,363	14,906	10,805	13,240	64,314	1,235
February	24,095	12,755	8,385	12,031	57,266	2,515
March	25,500	18,227	6,718	14,059	64,504	2,335
April	26,075	17,795	6,662	15,527	66,059	1,050
May	25,034	18,616	3,445	20,583	67,678	890
June	28,478	21,835	4,365	14,883	69,561	1,105
July	23,761	11,941	1,706	13,777	51,185	870
August	20,831	13,312	666	12,541	47,350	2,210
September	18,230	13,580	1,292	14,761	47,863	1,780
October	80	439	-	78	437	-
November	8,302	9,454	240	4,647	22,643	1,140
December	18,864	14,349	2,846	8,387	44,446	3,510
Total	244,453	167,209	47,130	144,514	603,306	18,640

The product was distributed by leases as follows:

	<u>1949</u>	<u>1948</u>
George Maas Lease	411,662	471,448
Race Course Lease	191,644	198,869
Baldwin Kiln Road Lease		2,809
Total	603,306	673,126

f. Ore Statement

	<u>Maas</u>	<u>Race Course</u>	<u>Maas Spcl.</u>	<u>R.C. Spcl.</u>	<u>Total</u>	<u>Total Last Year</u>
On Hand 1-1-49	25,387	14,518	27,792	19,600	87,297	79,522
Product for Year	244,453	47,130	167,209	144,514	603,306	673,126
Total	269,840	61,648	195,001	164,114	690,603	752,648
Shipments	228,462	51,733	143,431	139,429	563,055	665,351
Balance on Hand	41,378	9,915	51,570	24,685	127,548	87,297
Decrease in Output					69,820	

GILBERT
25% OPI

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2. PRODUCTION, SHIPMENTS & INVENTORIES (Cont.)

g. Schedule of Operations

1949 January 1st to June 27th, 2 8-hour shifts, six days per week with small tramping and hoisting crews on the third shift. June 27th to October 1st, 2 8-hour shifts five days per week with exception of the week of August 14th to August 21st when the mine was idle for vacation. October 1st to November 14th the mine was idle on account of the strike. November 14th to December 31st, five days per week as before the strike.

1948 January 1st to December 31st, 2 8-hour shifts, six days per week, with a small tramping and hoisting crew on the third shift with the exception that the mine was idle the week of July 3rd for vacation.

1947 January 1st to December 31st, 2 8-hour shifts, six days per week, with a small tramping and hoisting crew on the third shift with the exception that the mine was idle the week of August 25th.

h. Delays

There were no major delays during 1949.

3. ANALYSIS

a. Average Mine Analysis on Output

	<u>1949</u>				<u>1948</u>			
	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Sul.</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Sul.</u>
Maas	59.11	.111	9.55	.048	59.19	.111	8.90	.056
Maas Special	58.58	.098	9.49	.160	59.35	.097	8.78	.160
Race Course	58.63	.111	9.54	.044	59.34	.104	8.58	.055
Race Course Special	58.72	.098	9.17	.155	59.39	.097	8.28	.150

b. Average Mine Analysis on Ore Shipped

<u>Grade</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Mang.</u>	<u>Alum.</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Loss</u>	<u>Moist.</u>
Maas & Race Course	58.60	.115	9.66	.22	3.00	.68	.40	.044	1.94	12.95
Maas & R.C. Special	58.60	.091	9.30	.23	3.25	.75	.25	.153	2.10	13.32

c. Average Natural Analysis of Ore in Stock - December 31, 1949

<u>Grade</u>	<u>Tons</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Mang.</u>	<u>Alum.</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Loss</u>	<u>Moist.</u>
Maas	41,378	50.64	.092	8.54	.19	2.59	.35	.35	.033	1.67	13.72
Maas Special	51,570	50.58	.087	8.15	.20	2.80	.65	.22	.139	1.81	13.89
Race Course	9,915	50.77	.092	8.58	.19	2.59	.59	.35	.053	1.68	13.54
Race Course Special	24,685	50.77	.084	7.76	.20	2.80	.65	.22	.127	1.81	13.90

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4. ESTIMATE OF ORE RESERVES

a. Developed Ore

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

<u>Standard</u> <u>Location</u>	<u>Maas</u> <u>Area</u>	<u>Race Course</u> <u>Lease</u>	<u>Maas Lease</u>	<u>B. K. Road</u> <u>City of Neg.</u> <u>Lease</u>	<u>Total</u> <u>Tons</u>
3rd to 4th Levels		67,201	820,177	3,854	891,232
4th to 5th Levels	64,488	74,035	303,901		442,424
Gross Total 12-31-49	64,488	141,236	1,124,078	3,854	1,333,656
Less 10% for Mining & Rock (as of Oct. 1)	7,120	14,432	114,446	385	136,383
Net Total Standard Grade	57,368	126,804	1,009,632	3,469	1,197,273

Special

4th to 5th Levels	83,250	126,698	326,233	30,300	566,481
5th to 6th Levels		620,437	2,009,022		2,629,459
Below 6th Level		18,542	1,214,792		1,233,334
Gross Total 12-31-49	83,250	765,677	3,550,047	30,300	4,429,274
Less 10% for Mining & Rock	8,325	77,879	357,429	3,030	446,663
Net Total Special Grade	74,925	687,798	3,192,618	27,270	3,982,611
Total All Grades	132,293	814,602	4,202,250	30,739	5,179,884

There was an increase of only 36,352 tons developed during the year and the distribution is as follows: (16,000 tons of standard ore was recovered from the special grade area)

	<u>Maas</u>	<u>Race Course</u>	<u>Total</u>
Standard Grade	30,753 Tons	26,209 Tons	56,962 Tons
Special Grade	10,826 "	9,784 "	20,610 "
Total	19,927 Tons	16,425 Tons	36,352 Tons

There were approximately 25,000 tons developed in the Maas area where the South footwall, 25 feet below the 14th Level, Negaunee Mine, was found to be nearly vertical instead of dipping to the North at about 70°.

c. Estimated Natural Reserve Analysis

<u>Grade</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Mang.</u>	<u>Alum.</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Loss</u>	<u>Moist.</u>
Maas & Race Course Standard	51.00	.100	8.05	.17	2.50	.430	.20	.050	1.60	13.50
Maas & Race Course Special	51.10	.090	8.05	.18	2.45	.600	.10	.200	1.40	13.50

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4. ESTIMATE OF ORE RESERVES

d. Estimated Production
January 1st to December 31st, 1950

<u>Grade</u>	<u>Estimated Production</u> <u>10 Shifts Per Week</u>				
Maas & Race Course Standard	275,000				
Maas & Race Course Special	325,000				
Total	600,000				
<u>Grade</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Sul.</u>	<u>Moist.</u>
Maas & Race Course Standard	58.80	.110	9.30	.050	13.50
Maas & Race Course Special	58.80	.100	9.30	.200	13.50

5. LABOR & WAGES

a. Comments

There were 55 new employees hired to replace those who were lost for various reasons. Nearly all the new men were between the ages of 18 and 25 with little or no experience in mining.

There was no increase in wages during 1949 but at the end of the strike a non-contributory pension plan was announced whereby a man 65 years of age with 25 years of service will receive at least \$100 per month including his Social Security. Eleven men who had reached the age of 65 or more were retired during the year and these men had been employed from 25 to 47 years with two exceptions, and these two men had 19 and 23 years of service. The average age of all the employees at the end of the year was 43 with 46 men being 60 or over and, of these latter, 20 men had worked 40 years or more for the Company, with an average service of 32 years for all men over 60 years of age.

The mine was shut down from August 14th to the 21st for vacation and the men's vacation pay was distributed as follows:

- 44 Men, or 11% of the total, received one week's pay.
- 232 Men, or 59% of the total, received two week's pay.
- 95 Men, or 24% of the total, received three week's pay.
- 24 Men, or 6% of the total, were ineligible, having worked less than 1 yr.

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5. LABOR & WAGES

a. Comments (Cont.)

The following table shows a comparison in labor turnover for the last three years:

	<u>1949</u>	<u>1948</u>	<u>1947</u>
Died	3	2	1
Fatal Accident	1	0	2
Retired on Account of Age	12	5	0
Unable to Continue Work on Account of Ill Health	2	2	5
Transferred to Other C.C.I.Co. Properties	23	4	12
Quit	4	19	23
Discharges & Lay-Offs	1	4	2
Total Loss	46	36	45
Hired or Transferred to Maas	60	42	22
Net Loss	14	6	23
Net Gain	14	6	23
Experienced Miners Included in Total Loss	4	3	18

Proportion of surface to underground men:

<u>1949</u>	<u>1948</u>	<u>1947</u>	<u>1946</u>	<u>1945</u>
1 - 4.9	1 - 5.0	1 - 5.0	1 - 5.1	1 - 4.5

b. Comparative Statement of Wages & Product

	<u>1949</u>	<u>1948</u>	<u>Increase</u>
Product	603,306	673,126	69,820
Number of Shifts & Hours	245	302	57
1 8-hour	-	3	3
2 8-hour	245	299	54

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5. LABOR & WAGES

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

	<u>1949</u>	<u>1948</u>	<u>Increase</u>	<u>Decrease</u>
<u>AVERAGE NO. MEN WORKING</u>				
Surface	63	61	2	
Underground	315	306	9	
Total	<u>378</u>	<u>367</u>	<u>11</u>	
 <u>AVERAGE WAGES PER DAY</u>				
Surface	11.29	10.97	.32	
Underground	12.88	12.49	.39	
Total	<u>12.62</u>	<u>12.23</u>	<u>.39</u>	
 <u>AVERAGE WAGES PER MONTH</u>				
<u>12 Shifts per Week</u>				
<u>12 & 10 Shifts per Week - 1949</u>				
Surface	248.38	274.25		25.87
Underground	283.36	312.25		28.89
Total	<u>277.64</u>	<u>305.75</u>		<u>28.11</u>
 <u>PRODUCT PER MAN PER DAY</u>				
Surface	35.79	32.42	3.37	
Underground	7.79	7.25	.54	
Total	<u>6.40</u>	<u>5.93</u>	<u>.47</u>	
 <u>LABOR COST PER TON</u>				
Surface	.321	.345		.24
Underground	1.657	1.724		.67
Total	<u>1.978</u>	<u>2.069</u>		<u>.91</u>
 <u>AVERAGE PRODUCT MINING</u>				
Stoping	25.13	22.95	2.18	
Ore Development	12.27	13.79		1.52
Total	<u>24.83</u>	<u>22.82</u>	<u>2.01</u>	
 <u>AVERAGE WAGES CONTRACT LABOR</u>				
	13.73	13.22	.51	
 <u>TOTAL NUMBER OF DAYS</u>				
Surface	16,857 $\frac{3}{4}$	20,765 $\frac{1}{4}$		3,907 $\frac{1}{2}$
Underground	77,420 $\frac{1}{4}$	92,787 $\frac{1}{4}$		15,367
Total	<u>94,278</u>	<u>113,552 $\frac{1}{2}$</u>		<u>19,274 $\frac{1}{2}$</u>
 <u>AMOUNT FOR LABOR</u>				
Surface	193,896.90	232,412.91		38,516.01
Underground	999,540.71	1,160,772.84		161,232.13
Total	<u>1,193,437.61</u>	<u>1,393,185.75</u>		<u>199,748.14</u>
 <u>AVERAGE WAGES PER MONTH BASED ON MEN CARRIED ON MINE PAYROLL</u>				
Surface	248.38	261.35		12.97
Underground	283.36	300.74		17.38
Total	<u>277.64</u>	<u>294.09</u>		<u>16.45</u>