

The [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible]
[illegible] [illegible] [illegible]
[illegible] [illegible] [illegible]

#1998

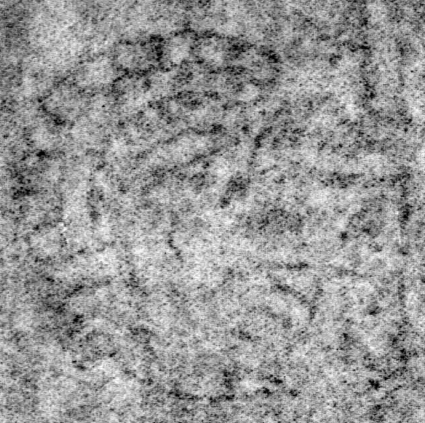
1929

152

123

PSP

天
地
人
三
才
一
理



天
地
人
三
才
一
理

天
地
人
三
才
一
理

天
地
人
三
才
一
理

THE CLEVELAND-CLIFFS IRON COMPANY
MINE DEPARTMENT - MANAGER'S ANNUAL REPORT

I N D E X

THE CLEVELAND-CLIFFS IRON COMPANY

Page 2

MINE DEPARTMENT - MANAGER'S ANNUAL REPORT.

	<u>PAGES</u>
Annual Report of the Safety Department	261-275
a. Fatal Accidents	261-263
b. Serious and Slight Accidents	266-282
c. Safety Inspection	270
d. Special Safety Measures	271-275
e. Rules and Regulations	<u>PAGES</u>
<u>ISHPEMING DISTRICT MINES</u>	274
Mine Rescue Work	274-275
Cliffs Shaft Mine	7-31
Holmes Mine	32-51
Morris-Lloyd Mine	52-87
Barnes-Hecker Mine	88-
Ogden Mine	89-101
<u>NEGAUNEE DISTRICT MINES</u>	276
Maas Mine and Crushing Plant	277
Negaunee Mine	102-126
Maas Mine	127-156
Athens Mine	157-180
North Jackson Mine	181
South Jackson Mine	182
<u>GWINN DISTRICT MINES</u>	278
Gwinn Mine and Gwinn Crushing Plant	278
Austin Mine	183-198
Stephenson Mine	199-214
Princeton Mine	215-218
Gwinn Mine	219-221
Gardner-Mackinaw Mine	222-228
Francis Mine	229-230
Gwinn District Mines	231-240
<u>OTHER MICHIGAN MINES</u>	281
Electrical Department	282-283
Republic Mine	241-267
Spies-Virgil Mine	268-298
<u>MINNESOTA MINES</u>	299
Wade Mine	299-305
Hill-Trumbull Mine	306-324
Boeing Mine	325-343
Annual Report of Geologist	344-360
a. Staff	344
b. Division of Work Among Members of the Department	345
c. Surface Geological Surveys	348
d. Underground Geological Surveys	348
e. Options and Leases	351
f. Explorations	352-353
g. Surface Explorations	354-355
h. Underground Explorations	356-357
i. Explorations by Other Companies	358
j. Examination of Mineral Land Offers	358
k. Expense Statements	360

THE CLEVELAND-CLIFFS IRON COMPANY
MINE DEPARTMENT - MANAGER'S ANNUAL REPORT
I N D E X

Page 2

	<u>PAGES</u>
Annual Report of the Safety Department	361-375
a. Fatal Accidents	361-365
b. Serious and Slight Accidents	366-369
c. Safety Inspection	370
d. Special Safety Measures	371-373
e. Rules and Regulations	374
f. First Aid Work	374
g. Mine Rescue Work	374-375
h. Miscellaneous Statistics	375
Annual Report of Mechanical Department	376-418
Hard Ore and Other Shops	376
Cliffs Shaft Mine	376
Holmes Mine	376
Ogden Mine	376
Athens Mine	376
Maas Mine and Crushing Plant	377
Negaunee Mine	377
South Jackson Crushing Plant	377
Barnes-Hecker Mine	377
Lloyd Mine	377
Morris Mine	378
Section 6 Shaft	378
Austin Mine	378
Gwinn Mine and Gwinn Crushing Plant	378
Mackinaw Mine	378
Princeton Mine and Princeton Central Power Plant	378
Stephenson Mine	379
Boeing Mine	379
Boiler Insurance	379-380
Hill-Trumbull Mine	380-381
Republic Mine	379
Wade Mine	381
Spies Mine	379
Electrical Department	382-410
Comparative Tables	411-413
Blue Print of Kilowatts	414
Distribution of Electric Power	415
Water Lost by Overflow, Current Made by Steam and Water	416
Precipitation by Years	417
Cost Diagram	418
Annual Report of Mining Engineering Department	419-431
a. List of Annual Report Map Books for 1926	419
b. Map Detail	420
c. Remarks on the Abstract Department	420-421
d. The Force	422-427
e. Percentage of Time Spent Underground	428
f. Distribution of Time and Cost to Various Mines, Etc.	428-429
h. Automobiles	430
i. Mines	430
j. Miscellaneous	431

THE CLEVELAND-CLIFFS IRON COMPANY
MINE DEPARTMENT - MANAGER'S ANNUAL REPORT
I N D E X
MINE DEPARTMENT - MANAGER'S ANNUAL REPORT
CROSS INDEX BY MINES
Page 3

	CLIFFS	MORTS	PAGES
Annual Report of Pension Department			432-505
a. Workmen's Compensation			432-446
b. Benefit Funds			447-450
c. Workmen's Compensation-Barnes-Hecker			451-454
a. Pension System			455-459
b. Republic Mine Funds			460-462
c. Suspense Funds			463
d. Visiting Nurses			463-467
e. Rest Cottage			468-
f. North Lake Club House			469
g. Gwinn Association			470-479
h. Ishpeming Y.M.C.A.			480-482
i. Safety Work			483-485
j. Hospitals & Medical Service			486-492
k. Health			493
l. Red Cross			493-495
m. Relief Work			496
n. Employment			496
o. Incapacitated Employes			496-497
p. Cost of Living			497
q. Improvement Work			497-498
r. Prize Premises			499
s. Community Service Work			499
t. Clubs			499
u. Outdoor Sports			499
v. General Matters			500
w. Various Departments			500-505

MM:EMB
3-2-28
-5-

	SOUTH	NORTH
.....	182	181
.....	182-184	187-189
.....	184	189
.....	185	189-190
.....	186-187	190-191
.....	187	191
.....	187-188	192-193
.....	188-189	193
.....	189	194
.....	189-190	194-195
.....	190	195
.....	190-191	196-197
.....	191	197
.....	191-192	198
.....	192	198
.....	192-193	199
.....	193	199
.....	193-194	200
.....	194	200
.....	194-195	201
.....	195	201
.....	195-196	202
.....	196	202
.....	196-197	203
.....	197	203
.....	197-198	204
.....	198	204
.....	198-199	205
.....	199	205
.....	199-200	206
.....	200	206
.....	200-201	207
.....	201	207
.....	201-202	208
.....	202	208
.....	202-203	209
.....	203	209
.....	203-204	210
.....	204	210
.....	204-205	211
.....	205	211
.....	205-206	212
.....	206	212
.....	206-207	213
.....	207	213
.....	207-208	214
.....	208	214
.....	208-209	215
.....	209	215
.....	209-210	216
.....	210	216
.....	210-211	217
.....	211	217
.....	211-212	218
.....	212	218
.....	212-213	219
.....	213	219
.....	213-214	220
.....	214	220
.....	214-215	221
.....	215	221
.....	215-216	222
.....	216	222
.....	216-217	223
.....	217	223
.....	217-218	224
.....	218	224
.....	218-219	225
.....	219	225
.....	219-220	226
.....	220	226
.....	220-221	227
.....	221	227
.....	221-222	228
.....	222	228
.....	222-223	229
.....	223	229
.....	223-224	230
.....	224	230
.....	224-225	231
.....	225	231
.....	225-226	232
.....	226	232
.....	226-227	233
.....	227	233
.....	227-228	234
.....	228	234
.....	228-229	235
.....	229	235
.....	229-230	236
.....	230	236
.....	230-231	237
.....	231	237
.....	231-232	238
.....	232	238
.....	232-233	239
.....	233	239
.....	233-234	240
.....	234	240
.....	234-235	241
.....	235	241
.....	235-236	242
.....	236	242
.....	236-237	243
.....	237	243
.....	237-238	244
.....	238	244
.....	238-239	245
.....	239	245
.....	239-240	246
.....	240	246
.....	240-241	247
.....	241	247
.....	241-242	248
.....	242	248
.....	242-243	249
.....	243	249
.....	243-244	250
.....	244	250
.....	244-245	251
.....	245	251
.....	245-246	252
.....	246	252
.....	246-247	253
.....	247	253
.....	247-248	254
.....	248	254
.....	248-249	255
.....	249	255
.....	249-250	256
.....	250	256
.....	250-251	257
.....	251	257
.....	251-252	258
.....	252	258
.....	252-253	259
.....	253	259
.....	253-254	260
.....	254	260
.....	254-255	261
.....	255	261
.....	255-256	262
.....	256	262
.....	256-257	263
.....	257	263
.....	257-258	264
.....	258	264
.....	258-259	265
.....	259	265
.....	259-260	266
.....	260	266
.....	260-261	267
.....	261	267
.....	261-262	268
.....	262	268
.....	262-263	269
.....	263	269
.....	263-264	270
.....	264	270
.....	264-265	271
.....	265	271
.....	265-266	272
.....	266	272
.....	266-267	273
.....	267	273
.....	267-268	274
.....	268	274
.....	268-269	275
.....	269	275
.....	269-270	276
.....	270	276
.....	270-271	277
.....	271	277
.....	271-272	278
.....	272	278
.....	272-273	279
.....	273	279
.....	273-274	280
.....	274	280
.....	274-275	281
.....	275	281
.....	275-276	282
.....	276	282
.....	276-277	283
.....	277	283
.....	277-278	284
.....	278	284
.....	278-279	285
.....	279	285
.....	279-280	286
.....	280	286
.....	280-281	287
.....	281	287
.....	281-282	288
.....	282	288
.....	282-283	289
.....	283	289
.....	283-284	290
.....	284	290
.....	284-285	291
.....	285	291
.....	285-286	292
.....	286	292
.....	286-287	293
.....	287	293
.....	287-288	294
.....	288	294
.....	288-289	295
.....	289	295
.....	289-290	296
.....	290	296
.....	290-291	297
.....	291	297
.....	291-292	298
.....	292	298
.....	292-293	299
.....	293	299
.....	293-294	300
.....	294	300
.....	294-295	301
.....	295	301
.....	295-296	302
.....	296	302
.....	296-297	303
.....	297	303
.....	297-298	304
.....	298	304
.....	298-299	305
.....	299	305
.....	299-300	306
.....	300	306
.....	300-301	3

THE CLEVELAND-CLIFFS IRON COMPANY
MINE DEPARTMENT - MANAGER'S ANNUAL REPORT
CROSS INDEX BY MINES

	AUSTIN	STEPHEN-SON	PRINCE-TON	GWINN	GARD. MACK.	FRANCIS	GWINN DISTRICT MINES
<u>GWINN DISTRICT MINES</u>							
1. General	183	199	215	219	222-	228	231-233
2. Production, Shipments & Inventories	183-185	199-201	215	219	222-223	229	-
3. Analysis	185	201-202	216	219-220	223	229	-
4. Estimate of Ore Reserves	185	202	216	220	223-224	-	-
5. Labor and Wages	185-186	202-204	-	-	-	-	233
6. Surface	186	204	217	220	224-26	229	-
7. Underground	187-191	204-213	217	220	-	-	-
8. Cost of Operating	191-197	213	217	221	226-227	230	-
9. Explorations & Future Explorations	-	-	-	-	-	-	-
10. Taxes	198	213	218	221	227-228	230	233-235
11. Accidents & Personal Injury	198	214	-	-	-	-	-
12. New Construction & Proposed New Construction	-	-	-	-	-	-	-
13. Equipment & Proposed Equipment	-	-	-	-	-	-	-
14. Maintenance & Repairs	-	-	-	-	-	-	-
15. Power	-	-	-	-	-	-	-
16. Water Supply	-	-	-	-	-	-	235-237
17. Mine Location-Condition of Premises	-	-	-	-	-	-	237
18. Nationality of Employes	-	-	-	-	-	-	-
19. Club House, County Park, Future of Gwinn	-	-	-	-	-	-	238-240

	REPUBLIC	SPIES-VIRGIL	WADE	HILL-TRUMBULL	BOEING
<u>OTHER MICHIGAN MINES & MINNESOTA MINES:</u>					
1. General	241-242	268	299	306	325
2. Production, Shipments & Inventories	242-247	268-271	299-300	306-308	325-328
3. Analysis	247	271	300-301	308-309	328
4. Estimate of Ore Reserves	248-249	271-272	301-302	309-310	329-331
5. Labor and Wages	249-250	272-273	302	310	331-333
6. Surface	251	274-275	303	311-312	333-334
7. Underground & Open Pit	252-257	276-282	303-304	312-315	334-339
8. Cost of Operating	258-264	283-288	-	316-318	340-342
9. Explorations & Future Explorations	264	290-291	305	318	342
10. Taxes	265	292-293	305	319	342
11. Accidents & Personal Injury	265	293-294	-	319	342
12. New Construction & Proposed New Construction	-	295	-	320	342
13. Equipment & Proposed Equipment	-	294-295	-	320	342-343
14. Maintenance & Repairs	-	296-298	-	320-323	-
15. Power	266	-	-	-	-
16. Water Supply	-	298	305	-	-
17. Mine Location-Condition of Premises	266	298	305	-	343
18. Nationality of Employes	267	298	305	-	343
19. Washing Plant Operations	-	-	-	323-324	-

Ishpeming, Michigan,
January 1st, 1928



Mr. Wm. G. Mather, President,
Cleveland, Ohio

-2-

1-1-28

The following statement shows a comparison of all of the Company's mines
Dear Sir:- for 1927 as compared with 1926.

1928
FEB
13

LABOR COST
PER TON

I beg to submit the report of the operations of the Mining
Department for the year 1927.

The inventories, maps and statements relative to the 1927 report
have gone forward to you under separate cover.

The colored portions of the maps show the work for the year. The
reports of the different mines of the Company were made by the Superintendents
in charge and the reports of the Engineering, Mechanical, Electrical, Geological,
Safety and Welfare Departments by the heads of these Departments.

On November 4th, 1927, the Company purchased the fee of the land known
as the Barnes-Hecker, by government description amounting to 480 acres. By
this purchase, the Company is relieved of any possibility of a suit from the
fee owners due to the Barnes-Hecker disaster and the loss of the mine.

On May 20th, 1927, the Company purchased the fee of a property on the
Cuyuna Range known as the Clark Mine which has been named by us "Pontiac".

Directly west of the Pontiac we drilled what is known as the Mathieson
and Benedictine Sisters options. Little ore was shown up on either of these
options and both of them were allowed to expire.

The Company has also explored what is known as the Joan No. 3 option on
the Cuyuna Range and on January 1st, 1928, took a lease on the property. This
will be worked in conjunction with the Pontiac and will be known as the Pontiac.

On October 15th, 1927 the Company ceased mining operations at the Boeing
Mine and on November 19th, surrendered it's lease. Most of the remaining ore
was in the floor of the open pit. On account of the depth of the pit and the
steepness of the banks and caving of them, mining operations were considered un-
safe; therefore the property was shut down.

On July 29th, all of the available ore which could be mined at a profit
at the Stephenson Mine was exhausted and hoisting ceased on that date. As we have
a large amount of ore in stockpile, it is impossible to cancel the lease until
this has been shipped.

All of the ore in the Austin Mine was exhausted on September 13th and
the lease was surrendered on November 26th. A two year lease on the stockpile
grounds was requested as there was still considerable ore which had not been
shipped. This lease was not executed by the fee owners until early in February,
1928.



STATEMENT SHOWING COMPARATIVE COST FOR ALL EXPLOSIVES USED AT 2450 250 255

	1924	1925	1926	1927
Prodnet.	572,019	590,915	594,972	466,382

Mr. Mather -2- 1-1-28

The following statement shows a comparison of all of the Company's mines for the year 1927 as compared with 1926.

Total lbs.	TONS	TONS PER MAN PER DAY	COST ON CARS	AVERAGE RATE PER DAY	LABOR COST PER TON
1926	3,366,557	4.85	2.420	5.12	1.054
1927	3,497,273	5.17	2.181	5.16	.999
Increase	131,716	.32		.04	
Decrease			.239		.055

Special statements requested by you analyzing various supply items and also labor will be found in the report.

The only outstanding lease is to the Empire Iron Company covering the SW₁ of Section 19-47-26. This property has been sublet to the Clement K. Quinn Company who operated it in 1927.

Rate, price per lb. - powder,	.1478	.1474	.1439	.1415
Cost per ton - powder,		1194	1358	1174
" " " - fuse, caps, etc.		.0094	.0122	.0121
" " " - all explosives,	.1457	.1288	.1480	.1274
Lbs. powder per ton ore,	.9143	.8095		

Yours very truly,

Manager.

SFE:DP

Above figures are combined totals of Cliffs Shaft and Republic Mines.

STATEMENT SHOWING COMPARATIVE COST FOR ALL EXPLOSIVES USED AT HARD ORE MINES.

	1924.	1925.	1926.	1927.	1927.
Product, - - - - -	372,019	390,915	394,972	466,382	1,635,408
<u>POWDER.</u>					
Lbs. 40%, - - - - -		107,370		2,900	
" 50%, - - - - -	326,480	295,260	326,406	314,961	113,075
" 60%, - - - - -	13,650	21,200	46,150	49,550	39,350
" No. 3 special, - - - - -				22,250	325,380
Total lbs.,	340,130	316,460	372,556	386,761	
Total cost,	50,280.25	46,668.46	53,625.27	54,763.92	2,250
Fuse - feet, - - - - -	437,750	413,600	538,355	600,440	113,857.94
Caps - number, - - - - -	96,900	93,950	113,406	102,345	
Cap crimpers, - - - - -	12	33	44	27	2,354.900
Tamping bags, - - - - -	9,870	11,890	22,830	3,370	421,907
Fuse lighters, - - - - -	450	0			18
Ignitors, wire, - - - - -			1,200		38
Elect. exploders, - - - - -			50		
Connecting wire, - - - - -	51,700	112,915	26		12,459
Leading wire, - - - - -			500		178
Total cost fuse, etc.,	3,922.52	3,685.23	4,829.48	4,691.64	
Total cost all explosives,	54,202.77	50,353.69	58,454.75	59,455.56	
Aver. price per lb. - powder,	.1478	.1474	.1439	.1416	
Cost per ton - powder,	.1352	.1194	.1358	.1174	
" " " - fuse, caps, etc.,	.0105	.0094	.0122	.0100	
" " " - all explosives,	.1457	.1288	.1480	.1274	
Lbs. powder per ton ore, - - -	.9143	.8095	.9432	.8293	
Pounds powder per ton of ore,					

Above figures are combined totals of the following mines:- Saltsburg, Mass., Republic, Salisbury and Austin, Francis Mine abandoned 4/30/24; Saltsburg Mine abandoned 4/30/24; Saraso-Rocher Mine abandoned 11/5/28. Beeing Mine not included in 1927 figures.

JAP:ERR.

JAP:ERR.

STATEMENT SHOWING COMPARATIVE COST FOR EXPLOSIVES FOR CLYFFS DRIFT AND REPUBLIC MINES

STATEMENT SHOWING COMPARATIVE COST FOR ALL EXPLOSIVES USED AT SOFT ORE MINES.

Product	1924.	1925.	1926.	1927.
Product, - - - - -	1,803,173	1,825,884	2,052,255	1,835,406
<u>POWDER</u>				
Lbs. 30%, - - - - -	0	107,370	2,900	
" 40%, - - - - -	266,302	178,900	186,445	113,075
" 50%, - - - - -	233,150	204,700	315,420	339,950
" 60%, - - - - -	191,765	226,488	251,800	325,350
" 80%, - - - - -	950	300	2,300	0
" 35%, - - - - -			76,150	
#2 - #4 extra, - - - - -				3,250
Total lbs.,	692,167	717,758	835,015	781,625
Total cost,	102,860.17	106,628.94	119,487.81	113,557.94
Fuse - feet, - - - - -	2,079,350	2,147,200	2,322,700	2,364,900
Caps, - number, - - - - -	430,500	441,755	499,476	423,907
Electric exploders, - - - - -	424	222	76	15
Connecting wire, - - - - -	92#	48#	18#	2#
Leading wire, - - - - -	0	650'		
Tamping bags, - - - - -	51,700	112,915	132,230	112,459
Crimpers, - - - - -	225	177	140	178
Delay igniters, - - - - -	45	0		
Total cost fuse, etc.,	18,888.88	19,186.82	22,709.73	19,051.53
Total all explosives,	121,749.05	125,815.76	142,197.54	132,609.47
Aver. price per pound - powder,	.1486	.1486	.1431	.1453
Cost per ton for powder,	.0570	.0584	.0582	.0619
" " " " fuse, caps, etc.,	.0105	.0105	.0111	.0104
" " " " all explosives,	.0675	.0689	.0693	.0723
Pounds powder per ton of ore,	.3838	.3931	.4068	.4259
Lbs. powder per ton ore, total	.9143	.9095	.9432	.9188

Above figures are combined totals of the following mines:- Holmes, Maas, Negaunee, Athens, Stephenson, Francis, Morris-Lloyd, Barnes-Hecker, Boeing, Spies-Virgil, Salisbury and Austin. Francis Mine abandoned 4/30/24; Salisbury Mine abandoned 6/30/24; Barnes-Hecker Mine abandoned 11/3/26. Boeing Mine not included in 1927 figures.

JAP:EBR-IF
3-10-28

JAP:EBR.

STATEMENT SHOWING COMPARATIVE COST FOR EXPLOSIVES FOR CLIFFS SHAFT AND REPUBLIC MINES

	1924	1925	1926	1927
Product - - - - -	372,019	390,915	394,972	466,382
POWDER				
Lbs. 40% - - - - -		295,260	326,406	314,961
" 50% - - - - -	326,480			
" 60% - - - - -	13,650	21,200	46,150	49,550
" No.3 Special - - - - -				22,250
Total lbs.	340,130	316,460	372,556	386,761
Total cost	50,280.25	46,668.46	53,625.27	54,763.92
Fuse - feet - - - - -	437,750	413,600	538,355	600,440
Caps - number - - - - -	96,900	93,950	113,406	102,345
Cap Crimpers - - - - -	12	33	44	27
Tamping bags - - - - -	9,870	11,890	22,830	3,370
Fuse lighters - - - - -	450	0		
Ignitors - - - - -			1,200	
Elect. exploders - - - - -			50	
Connecting Wire - - - - -			26	
Leading wire - - - - -			500	
Total cost fuse, etc.,	3,922.52	3,685.23	4,829.48	4,691.64
Total cost all explosives	54,202.77	50,353.69	58,454.75	59,455.56
Average price per lb. - powder	.1478	.1474	.1439	.1416
Cost per ton - powder	.1352	.1194	.1358	.1174
" " " - fuse,caps,etc.,	.0105	.0094	.0122	.0100
" " " - all explosives,	.1457	.1288	.1480	.1274
Lbs. powder per ton Cliffs Shaft	.8204	.7572	.7516	.7455
" " " " Republic	1.282	1.040	2.134	1.357
Lbs. powder per ton ore, total	.9143	.8095	.9432	.8293
Excessive use of powder at Republic in 1926 due to extensive development program.				
Total cost for all timber	178,718.25	207,363.21	208,941.07	149,817.45

JAP:EER-DF
 2-10-28
 Figures are combined totals of the following mines:- Holmes, Mass, Negaunee, Athens, Francis, Morris-Lloyd, Barnes-Hecker, Boeing, Spies-Virgil, Salisbury and Austin. Francis Mine abandoned 4/30/24; Salisbury Mine abandoned 2/30/24; Barnes-Hecker Mine abandoned 11/3/26. Boeing Mine not included in 1927 figures.

Boeing Mine timber cost is much higher than our other mines. By eliminating the Boeing the cost per ton for all the other mines shows little change. The lower cost of 1927 is due to the decrease in quantity used.

STATEMENT SHOWING COMPARATIVE COST FOR ALL MINE TIMBER USED AT SOFT ORE MINES

	1924	1925	1926	1927
Product - - - - -	1,803,173	1,825,884	2,025,255	1,835,406
<u>TIMBER</u>				
Feet 4 to 6 - - - - -	9,614	4,648	45,294	0
6 to 8 - - - - -	391,593	572,126	543,275	484,217
8 to 10 - - - - -	462,564	406,867	471,550	372,289
10 to 12 - - - - -	201,247	245,548	269,767	268,634
12 to 14 - - - - -	78,709	83,794	85,282	104,591
14 to 16 - - - - -	1,572	176	5,939	16,511
7 to 9 - - - - -	135,066	133,096	76,442	0
9 to 12 - - - - -	102,321	168,619	146,312	0
Total feet	1,382,686	1,614,874	1,643,861	1,246,242
Total cost	100,281.65	128,792.52	115,102.94	79,754.35
<u>LAGGING</u>				
Feet 5' - - - - -	1,795,412	2,008,550	2,348,612	1,553,163
6' - - - - -	674,820	385,800	747,840	173,500
7' - - - - -	2,952,460	2,374,426	2,869,971	3,434,969
8' - - - - -	497,617	1,031,632	1,009,672	1,076,343
Total feet	5,920,309	5,800,408	6,976,095	6,237,975
Total cost	45,057.78	44,359.56	52,292.53	45,264.93
Covering boards - feet - - - - -	619,404	734,585	798,527	165,106
Total cost	10,099.98	11,319.54	11,960.39	3,049.89
Poles - feet - - - - -	1,918,734	1,970,783	2,493,741	1,544,937
Total cost	23,278.84	22,891.59	29,585.21	21,748.28
Average cost per foot - timber - - - -	.0725	.0797	.0700	.0640
" " " 100' - lagging - - - -	.7610	.7648	.7496	.7288
" " " 100' - cover boards	1.6306	1.5409	1.5409	1.8472
" " " 100' - poles - - - -	1.2132	1.1615	1.1615	1.4077
Feet timber per ton of ore - - - - -	.767	.884	.801	.679
" lagging " " " " - - - - -	3.283	3.177	3.399	3.398
" poles " " " " - - - - -	1.064	1.079	1.215	.842
Cost per ton for timber - - - - -	.0557	.0705	.0561	.0434
" " " " lagging - - - - -	.0249	.0243	.0255	.0247
" " " " poles - - - - -	.0129	.0125	.0144	.0118
" " " " cover boards - - - -	.0056	.0062	.0058	.0017
Cost per ton for all mines	.0991	.1135	.1018	.0816
Cost per ton excluding Boeing	.0880	.0880	.0930	.0816
Total cost for all timber	178,718.25	207,363.21	208,941.07	149,817.45

Above figures are combined totals of the following mines:- Holmes, Maas, Negaunee, Athens, Stephenson, Francis, Morris-Lloyd, Barnes-Hecker, Boeing, Spies-Virgil, Salisbury and Austin. Francis Mine abandoned 4/30/24; Salisbury Mine abandoned 6/30/24; Barnes-Hecker Mine abandoned 11/3/26. Boeing Mine not included in 1927 figures.

Boeing Mine timber cost is much higher than our other mines. By eliminating the Boeing the cost per ton for all the other mines shows little change. The lower cost of .0816 for 1927 is due to the decrease in quantity used.

STATEMENT SHOWING TOTAL COST FOR SUPPLIES CHARGED TO
"COST OF ORE AT MINES"

SOFT ORE MINES

YEAR	1924		1925		1926		1927	
PRODUCT	1,644,233		1,825,884		2,052,255		1,835,406	
CLASSIFICATION	AMOUNT	PER TON	AMOUNT	PER TON	AMOUNT	PER TON	AMOUNT	PER TON
General	94,352.55	.0573	87,283.11	.0478	93,473.76	.0455	85,520.88	.0465
Iron & Steel	27,041.35	.0164	26,849.93	.0147	31,656.04	.0154	28,956.99	.0157
Machinery Supplies	88,119.58	.0535	99,663.91	.0545	126,562.61	.0616	85,936.53	.0468
Explosives	129,354.94	.0786	141,760.34	.0776	166,713.88	.0812	151,669.06	.0826
Lumber - Timber	170,567.23	.1037	231,884.16	.1269	238,095.23	.1160	180,515.49	.0983
Fuel	43,396.41	.0263	42,396.64	.0232	47,348.87	.0230	34,728.59	.0189
Electric Power	337,963.56	.2055	341,884.27	.1872	364,360.25	.1175	361,104.77	.1967
Miscellaneous	71,050.46	.0432	93,175.06	.0510	79,162.37	.0385	56,414.20	.0307
TOTAL	961,846.08	.5848	1,064,897.42	.5832	1,147,372.71	.5590	984,846.51	.5365

HARD ORE MINES

YEAR	1924		1925		1926		1927	
PRODUCT	372,019		446,670		366,882		467,510	
CLASSIFICATION	AMOUNT	PER TON	AMOUNT	PER TON	AMOUNT	PER TON	AMOUNT	PER TON
General	28,601.32	.0768	35,776.65	.0800	35,756.69	.0974	29,726.59	.0635
Iron & Steel	16,071.56	.0432	14,413.77	.0322	18,051.52	.0492	13,079.36	.0279
Machinery Supplies	32,552.41	.0875	36,875.08	.0825	36,827.06	.1003	32,525.13	.0695
Explosives	69,673.04	.1872	66,808.36	.1495	67,362.55	.1836	74,384.99	.1591
Lumber & Timber	13,859.09	.0372	14,014.51	.0313	12,995.23	.0354	9,431.02	.0201
Fuel	30,078.58	.0808	29,010.78	.0649	21,497.48	.0585	14,371.32	.0307
Electric Power	69,981.16	.1881	64,172.04	.1436	77,042.33	.2099	84,106.40	.1798
Miscellaneous	6,246.09	.0167	7,324.64	.0163	7,461.34	.0203	8,269.92	.0176
TOTAL	267,063.25	.7178	268,395.83	.6008	276,994.20	.7549	266,254.73	.5694

Above figures for Soft Ore Mines are combined totals of the following Mines:- Holmes, Morris-Lloyd, Barnes-Hecker, Spies-Virgil, Athens, Negaunee, Mass, Austin, Stephenson, Boeing, Francis and Salisbury. Boeing omitted for years 1924 and 1927. Francis abandoned April 30th, 1924; Salisbury abandoned June 30th, 1924. Combined totals of Cliffs Shaft and Republic Mines makes up total for Hard Ore Mines.

HARD ORE MINES

For 1924 there was considerable delay at Cliffs Shaft on account of lack of power due to water shortage.

For 1925 after deducting accumulated overruns of 56,735 tons which was included in the product, the Unit Cost is .6883 instead of .6008.

For 1926 the Cliffs Shaft Unit Cost was .570 while Republic was \$3.116 due to shortage in stockpile. Figuring Republic on actual tonnage the cost would be 1.517. Extensive development at Republic Mine caused high Unit Cost.

For 1927 increased product at Cliffs Shaft and abandonment of all exploratory and development work at Republic resulted in a smaller Unit Cost.

LABOR SUMMARY - ALL COMPANIES

TOTAL PRODUCT	1924		1925		1926		1927	
	DAYS	AMOUNT	DAYS	AMOUNT	DAYS	AMOUNT	DAYS	AMOUNT
	2,899,247		3,166,062		3,366,557		3,358,640	
Surface Cost per ton	236,655 $\frac{1}{2}$	1,071,908.50 .3697	222,954 $\frac{1}{2}$	1,012,074.67 .3197	220,589 $\frac{3}{4}$	998,311.45 .2965	208,281 $\frac{3}{4}$	945,048.09 .2813
Underground Cost per ton	431,980 $\frac{3}{4}$	2,189,728.65 .7553	404,188	2,057,956.52 .6500	420,686	2,136,173.30 .6345	392,984 $\frac{1}{4}$	2,008,260.19 .5979
Supt. & Gen. Roll Cost per ton	56,804 $\frac{3}{4}$	446,197.49 .1539	56,048 $\frac{1}{2}$	434,551.24 .1373	52,694	423,770.23 .1259	48,827 $\frac{1}{2}$	403,457.86 .1201
Grand Total Cost per ton	725,441	3,707,834.64 1.2789	683,190 $\frac{1}{2}$	3,504,582.43 1.1070	693,969 $\frac{3}{4}$	3,558,254.98 1.0569	650,093 $\frac{1}{2}$	3,356,766.14 .9993
Average Rate per Day		5.11		5.13		5.13		5.16
Tons per Man per Day		4.00		4.635		4.85		5.166

Note:- Above is total of all wages and salaries for all employees of the Mining Department, including the Cliffs Power & Light Company.

Superintendent & General Roll - Days and amounts shown is all of the General Payroll except Mine Clerks and Captains which are included in surface and underground.

CLIFFS SHAFT MINE
CLIFFS SHAFT MINE

ANNUAL REPORT

YEAR 1927.

2. PRODUCTION,
SHIPMENTS &
INVENTORIES:

1. GENERAL:

The Cliffs Shaft Mine finished the year 1927 with the largest production in its history. This was made possible by the development program carried out in 1926 and by further mechanization underground. New and larger cars on the high trestles between the shafts and the crusher building and more of the large cars underground increased the hoisting capacity to 200 tons per hour, nearly twice that originally planned, when the shafts were changed over from cages to skips in 1910.

Development has been carried out vigorously in 1927, but such a large production is a serious drain on known ore reserves, and, unless new developments are successful, it is difficult to maintain. Exploration by diamond-drill and by drifting and stoping is being carried on actively in "A" shaft in the Bancroft lease on Lot 2, Section 3, and in adjoining territory to the east and south, and discoveries of new ore in this part of the mine give promise of excellent results in the next few years. Good results have also been obtained in the South-East Deposit in "A" shaft, where intermittent ore-bodies have been opened along the south boundary, and are being followed into the territory of the old Moro Mine.

In "B" shaft the most promising developments have been, as in 1926, at the west end of the Main Vein, but this year the new ore is on the twelfth level instead of the thirteenth. Minor developments of new ore on the upper levels have helped out this shaft materially. It is inevitable that production from this shaft must decrease gradually from now on, as its possibilities are limited, and the deficiency is to be made up largely by Bancroft ore transferred from "A" shaft on the fifth level.

The mine continued on a single shift basis throughout the year, and worked five days a week for the first four months, and six days a week thereafter.

The Cliffs Shaft Crushed stockpile was the only one cleaned up during the season, a substantial balance being left in the Cliffs Shaft Lump pile and smaller amounts of both Bancroft Lump and Crushed.

2. PRODUCTION,
SHIPMENTS &
INVENTORIES:

a. Production by Grades:

<u>Grade</u>	<u>Product</u> <u>Tons</u>	<u>Overrun</u> <u>Tons</u>	<u>Total</u> <u>Tons</u>
Cliffs Shaft Lump	260,910		260,910
Cliffs Shaft Crushed	100,434	2,816	103,250
Total Cliffs Shaft	361,344	2,816	364,160
Bancroft Lump	27,894		27,894
Bancroft Crushed	10,478		10,478
Total Bancroft	38,372		38,372
Total Ore	399,716	2,816	402,532
Rock			27,114

The overrun estimated in the stockpiles in 1926 was taken up into production in that year, but the overrun shown this year was only on actual shipments.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

2. PRODUCTION,
SHIPMENTS &
INVENTORIES:
(Continued)

Dividing the ore by shipping grades, production was as follows:-

Lump Ore	288,804 Tons	71.7%
Crushed Ore	113,728 "	28.3%
Total Ore	402,532 "	100.0%

All the rock was dumped underground.

Comparison of Product for 1926 and 1927.

	1927 <u>Tons</u>	1926 <u>Tons</u>	Increase <u>Tons</u>	Decrease <u>Tons</u>
Production	399,716	331,373	68,343	
Stockpile Overrun	2,816	8,880		6,064
Total	402,532	340,253	62,279	
Percentage of Lump	71.7	70.7	1.0	
Percentage of Bancroft	9.6	11.3		1.7

In 1926 the ore was screened over 3 inch holes until May 30th, and thereafter over 2½ inch holes. In 1927 all the ore was screened over 2½ inch holes. A new combined screening and crushing arrangement has been practically completed, by which the large lumps will be crushed to 9 inches on the small dimension, and all ore will be screened over 2½ inch holes.

The mine worked five days a week in 1926, except in October and November, when it worked six days a week. In 1927 it worked five days a week until the end of April and thereafter six days a week. The total number of days worked was 291, and the average daily product was 1,383 tons. In 1926 the mine worked 267 days and produced 1,274 tons per day.

b. Shipments:

<u>Grade</u>	<u>Pocket Tons</u>	<u>Stockpile Tons</u>	<u>Total Tons</u>	<u>Total Last Year Tons</u>
Cliffs Shaft Lump	172,691	68,090	240,781	235,872
Cliffs Shaft Crushed	48,464	50,384	98,848	89,424
Total Cliffs Shaft	221,155	118,474	339,629	325,296
Bancroft Lump	13,634	8,417	22,051	22,812
Bancroft Crushed	3,496	1,143	4,639	9,914
Total Bancroft	17,130	9,560	26,690	32,726
Total Ore	238,285	128,034	366,319	358,022
Total Last Year	207,547	150,475	358,022	
Increase in Shipments			8,297	

Shipments to the dock began on April 18th and ended on November 12th. All rail shipments were made in every month of the year.

Production	399,716	331,373	68,343	
Stockpile	2,816	8,880		6,064
Overrun	2,816	8,880		6,064
Total	402,532	340,253	62,279	

CLIFFS SHAFT MINE
CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

2. PRODUCTION,
SHIPMENTS &
INVENTORIES:
(Continued)

c. Stockpile Inventories:

Grade	C.S. Lump	C.S. Crushed	Tons	Banc. Crushed	Total	Less
Cliffs Shaft Lump	46,926		46,926			
Bancroft Lump	5,069		5,069	1,715	37,294	36,213
Total Lump	51,995		51,995	10,478	399,716	389,238
Stockpile Overrun		2,816			2,816	2,816
Cliffs Shaft Crushed		15,103	15,103			
Bancroft Crushed		6,409	6,409	11,042	427,222	420,813
Total Crushed		21,512	21,512	11,042	399,716	399,025
Total Ore	46,926	18,103	73,507	10,478	399,716	388,734

On Dec. 31st, 1926 there was in stock 37,294 tons, 36,213 tons less than this year. There is ample room for stocking ore.

d. Division of Product by Levels:

Level	"A" Shaft Tons	"B" Shaft Tons	Total Tons
First	5,496	45,204	50,700
Second	11,654	3,608	15,262
Third	1,000	6,440	7,440
Fourth	4,760	2,117	6,877
Fifth	34,089	1,010	35,099
Sixth	33,686	8,131	41,817
Seventh	47,755	14,431	62,186
Eighth	29,537	7,152	36,689
Ninth	6,936	6,056	12,992
Tenth	39,234	1,538	40,772
Eleventh	20,874	645	21,519
Twelfth		31,539	31,539
Thirteenth		24,005	24,005
Fourteenth		13,849	13,849
Fifteenth		1,786	1,786
Total	235,021	167,511	402,532
Rock	14,072	13,042	27,114

e. Production by Months:

Month	Days	C.S. Lump	C.S. Crushed	Banc. Lump	Banc. Crushed	Total Ore	Rock
January	22	15,194	6,497	2,618	1,070	25,379	1,654
February	21	17,619	7,598	2,050	900	28,167	2,144
March	23	18,825	8,004	2,478	1,037	30,344	2,706
April	22	19,034	7,777	2,139	877	29,827	2,166
May	25	21,888	8,519	2,397	919	33,723	2,264
June	25	25,275	9,119	2,439	901	37,734	2,124
July	25	24,253	8,767	3,085	1,113	37,218	1,718
August	27	25,517	9,343	3,196	1,059	39,115	3,054
September	25	25,607	9,014	2,121	659	37,401	1,986
October	26	24,756	9,367	2,123	661	36,907	2,542
November	24	20,205	7,595	1,772	675	30,247	2,490
December	26	22,737	8,834	1,476	607	33,654	2,266
Year	291	260,910	100,434	27,894	10,478	399,716	27,114
Stockpile Overrun			2,816			2,816	
Total	291	260,910	103,250	27,894	10,478	402,532	27,114

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

2. PRODUCTION,
SHIPMENTS &
INVENTORIES:
(Continued)

Average Mine Analysis on Output:

f. Ore Statement:	Grade		Flux.		Silica		Total
	Lump	Crushed	Lump	Crushed	Lump	Crushed	
Cliffs Shaft Crushed	59.72	57.58	.100	.099	8.30	8.02	Total
Bancroft Lump	C.S.	C.S.	Ban.	Ban.	Total	Last	
Bancroft Crushed	Lump	Crushed	Lump	Crushed	Tons	Year	
On Hand Jan. 1, 1927.	22,271	9,556	3,752	1,715	37,294	55,063	
Output For Year	260,910	100,434	27,894	10,478	399,716	331,373	
Stockpile Overrun		2,816			2,816	8,880	
Transferred	4,526	1,145	4,526	1,145			
Total	287,707	113,951	27,120	11,048	439,826	395,316	
Shipments	240,781	98,848	22,051	4,639	366,319	358,022	
Balance on Hand	46,926	15,103	5,069	6,409	73,507	37,294	
Increase in Output	(All Mixed)				62,279		
Increase in Ore on Hand					36,213		

ESTIMATE OF
ORE RESERVES

g. Delays:

Date	Hours	Tons Lost	Cause	Cost
Jan. 18	1	125	Lump chute in crusher blocked.	
Jan. 21	1	125	Loose contact on lump stockpile car controller.	
Jan. 31	3/4	100	"A" shaft top-tram car off the track.	
Jan. 31	3/4	100	Disc grizzly blocked in crusher-building.	
Mar. 3	1 1/2	200	Pockets blocked with chunks.	
Mar. 21	1	135	Bancroft chute blocked.	
Mar. 21	1	65	"A" shaft pocket blocked.	
May 3	1 1/2	200	No current. Main line trouble.	
May 4	2 3/4	200	No current. Main line trouble.	
June 13	1 1/2	125	No current. Main line trouble.	
July 11	1 1/2	100	No current. Main line trouble.	
July 12	1	125	"B" shaft pocket blocked.	
Aug. 8	4 1/2	400	Water coming in "B" shaft.	\$ 52.36
Aug. 9	2	200	" " " " " "	
Oct. 11	1 1/2	225	Air-lift in crusher blew up.	23.75
Oct. 11	1/2	75	Overloaded car in crusher.	
Oct. 24	1/2	75	No railroad cars.	
Nov. 16	1	125	Lump pocket blocked.	
Nov. 16	3/4	100	"A" shaft pocket blocked with chunks.	
Year	24	2,800		\$ 76.11

h. Delays Due to Lack of Current:

Date	Hours	Tons Lost	Cause
May 3	1 3/4	200	No current. Main line trouble.
May 4	2 3/4	200	No current. Main line trouble.
June 13	1 1/2	125	No current. Main line trouble.
July 11	1 1/2	100	No current. Main line trouble.
Year	5 3/4	625	

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

3. ANALYSIS:

a. Average Mine Analysis on Output:

<u>Grade</u>	<u>Iron</u>	<u>Phos.</u>	<u>Silica</u>
Cliffs Shaft Lump	59.72	.100	6.30
Cliffs Shaft Crushed	57.38	.099	8.09
Bancroft Lump	59.21	.114	4.21
Bancroft Crushed	57.73	.121	4.87

b. Average Analysis on Straight Cargoes:

<u>Grade</u>	<u>Mine</u>		<u>Lake Erie</u>	
	<u>Iron</u>	<u>Phos.</u>	<u>Iron</u>	<u>Moisture</u>
Cliffs Shaft Lump	59.61	.103	59.35	.60
Cliffs Shaft Crushed	(All Mixed)		54.000	
Bancroft Lump	(All Mixed)		57.000	
Bancroft Crushed	(All Mixed)			

4. ESTIMATE OF ORE RESERVES:

a. Developed Ore - Cliffs Shaft Grade:

	<u>"A" Shaft</u>	<u>"B" Shaft</u>	<u>Total</u>
	<u>Tons</u>	<u>Tons</u>	<u>Tons</u>
Pillars	1,072,000	716,000	1,788,000
Floors	2,055,000	850,000	2,905,000
Partly Developed	30,000	14,000	44,000
<u>Total</u>	<u>3,157,000</u>	<u>1,580,000</u>	<u>4,737,000</u>
To Support Surface Available Ore	1,883,000	1,185,000	3,068,000
Less 10% Rock and 10% Loss in Mining	1,274,000	395,000	1,669,000
<u>Net Total</u>	<u>1,019,000</u>	<u>316,000</u>	<u>1,335,000</u>

RECAPITULATION

	<u>Developed</u>	<u>Prospective</u>	<u>Total</u>
	<u>Tons</u>	<u>Tons</u>	<u>Tons</u>
Available Ore	1,625,000	44,000	1,669,000
Less 10% Rock and 10% Loss in Mining	325,000	9,000	334,000
<u>Net Available Ore</u>	<u>1,300,000</u>	<u>35,000</u>	<u>1,335,000</u>

There was no shortage of labor during the year. At times an unusually large number of men were temporarily absent from work on account of illness or were working on their farms, and their places were not filled. A few men left the mine to work in the Blueberry and Holmes shafts. There was no change in the wage scale during the year.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

4. ESTIMATE OF ORE RESERVES:
(Continued)

a. Developed Ore - Bancroft Grade:

	\$715	"A" Shaft
	1-3	<u>Tons</u>
Pillars	291	75,000
Floors		43,000
Partly Developed		<u>12,000</u>
Total	57	130,000
To Support Surface	220	<u>59,000</u>
Available Ore	277	71,000
Less 10% Rock and 10% Loss in Mining		<u>14,000</u>
Net Total		57,000

RECAPITULATION

	Developed <u>Tons</u>	Prospective <u>Tons</u>	Total <u>Tons</u>
Available Ore	59,000	12,000	71,000
Less 10% Rock and 10% Loss in Mining	<u>12,000</u>	<u>2,000</u>	<u>14,000</u>
Net Available Ore	47,000	10,000	57,000

Assumptions:- 8, 9 and 10 cu. ft. equals one ton.
10% deduction for rock.
10% deduction for loss in mining.
Percentage of Bessemer equals 0.

c. Estimated Analysis:

	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Alum.</u>	<u>Mang.</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Igni.</u>	<u>Moist.</u>
Dried 212°	58.30	.100	6.71	2.45	.593	1.69	1.33	.010	2.66	
Natural	57.02	.098	6.56	2.40	.580	1.69	1.30	.010	2.60	2.20

The above analysis is for both Bancroft and Cliffs Shaft grades.

5. LABOR AND WAGES:

a. Comments:

(1) Labor:

There was no shortage of labor during the year, but at times an unusually large number of men were temporarily absent from work on account of illness or were working on their farms, and their places were not filled. A few men left the mine to work in the Blueberry and Holmes shafts.

There was no change in the wage scale during the year.

Surface	\$25,547.51	\$21,000.00
Underground	405,233.56	287,000.00
Total	430,781.07	308,000.00

*Notes:- Figures are based on production of 1927.
overrun.

Proportion of Surface to Underground

1927 - 1 to 5.66	1926 - 1 to 5.66
1925 - 1 to 3.89	1925 - 1 to 3.89
1925 - 1 to 3.41	1925 - 1 to 3.41
1924 - 1 to 3.19	1924 - 1 to 3.19
1923 - 1 to 3.37	1923 - 1 to 3.37
1922 - 1 to 3.33	1922 - 1 to 3.33
1921 - 1 to 2.44	1921 - 1 to 2.44

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

5. LABOR AND WAGES:
(Continued)

b. Comparative Statement of Wages and Product:

	<u>1927</u>	<u>1926</u>	<u>Increase</u>	<u>Decrease</u>
<u>*PRODUCT</u>	399,716	331,373	68,343	
No. Shifts & Hours	1-8	1-8		
No. of Days	291	267	24	
<u>AVG. NO. OF MEN WORKING:</u>				
Surface	57	53	4	
Underground	220	206	14	
Total	277	259	18	
<u>AVG. WAGES PER DAY:</u>				
Surface	4.39	4.44		.05
Underground	5.04	5.03	.01	
Total	4.91	4.89	.02	
<u>WAGES PER MO. OF 25 DAYS:</u>				
Surface	109.75	111.00		1.25
Underground	126.00	125.75	.25	
Total	122.75	122.25	.50	
<u>PRODUCT PER MAN PER DAY:</u>				
Surface	22.00	19.37	2.63	
Underground	6.19	5.91	.28	
Total	4.85	4.53	.32	
<u>LABOR COST PER TON:</u>				
Surface	.200	.229		.029
Underground	.814	.847		.033
Total	1.014	1.076		.062
AVG. PRODUCT BRK'G & TRM'G	11.14	9.54	1.60	
AVG. WAGES CONTRACT MINERS	5.57	5.49	.08	
AVG. WAGES CONTRACT LABOR	5.45	5.34	.11	
<u>TOTAL NO. OF DAYS:</u>				
Surface	18,169 ¹ / ₄	17,107 ¹ / ₂	1,061 ³ / ₄	
Underground	64,611 ¹ / ₄	56,039 ¹ / ₂	8,571 ³ / ₄	
Total	82,780 ¹ / ₂	73,147	9,633 ¹ / ₂	
<u>AMOUNT FOR LABOR:</u>				
Surface	79,735.77	76,027.79	3,707.98	
Underground	325,547.61	281,814.63	43,732.98	
Total	405,283.38	357,842.42	47,440.96	

*Note:- Figures are based on production without stockpile overrun.

Proportion of Surface to Underground Men:

- 1927 - 1 to 3.86
- 1926 - 1 to 3.89
- 1925 - 1 to 3.41
- 1924 - 1 to 3.19
- 1923 - 1 to 3.37
- 1922 - 1 to 3.39
- 1921 - 1 to 2.44
- 1924 - Mine worked 1-8 hr. shift 5 days per week from July 30th.
- 1925 - Mine worked 1-8 hr. shift 5 days per week.
- 1926 - 1-8 hr. shift 5 days per week from Jan. 1st to Oct. 1st. 1-8 hr. shift 6 days per week Oct. 1st to Dec. 1st.
- 1-8 hr. shift 5 days per week from Dec. 1st.
- 1927 - 1-8 hr. shift 5 das. per wk. 1-1 to 4-30. 1-8 hr. shift 6 das. per wk. from Apr. 30th.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

6. SURFACE:

a. Buildings, Repairs:

Hoist Motor:

A new stator was purchased for "A" shaft hoist motor, but has not been put in service.

Dry:

A new hot-water tank was put in service in November. Thirty new lockers were erected in June, and the old drying racks in the large room were replaced by hooks and chains.

Shaft-Houses:

Both shaft-houses were repaired with a cement gun in May and June, and a new water-line was laid to "A" shaft. "A" shaft skip-dump was rebuilt on one side in January.

Crusher Building and Top Tram:

New and larger steel cars of a new design were put on the top tram in March and April, increasing tramping capacity 200 tons per shift.

A new chute for fine lump was erected in the crusher-building in March.

Laboratory:

A new smoke-stack was erected in October.

Roads and Walks:

A new road was opened through the storage-yard to the end of Barnum St.

The walk between the office and the dry was regraded and hand rails and concrete perrones were built.

The road by the laboratory was finished in tar macadam as far as the top of the hill.

Storage-Yard:

The storage-yard was cleaned up and four cars of scrap were sold. It is planned to move this scrap-yard to the west end of the mine in 1928, using this ground for storage of bulk supplies.

b. Stockpiles:

The changes in the crusher-building necessitated some changes in the stockpile trestles. The crushed ore pile was nearly all cleaned up, and the new trestle has been erected, running south-east across the Deer Lake track.

One trestle for lump ore was not torn down in 1927, and was used again in the fall, being filled on December 17th. A new trestle was erected in December.

7. UNDERGROUND:

b. Development:

Development at the Cliffs Shaft Mine is divided into two classes:-

1. Opening new ore.
2. Preparing known ore for mining.

New ore is opened by drifts, raises and breast stopes. In this work breast-stopes and large raises are used mostly, because of greater economy in breaking ore. Drifts and raises are used for preparing known ore for mining.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
(Continued)

b. Development: (Continued)

As a breast-stope proves up approximately as much additional ore as is mined with it, the ore reserves can be maintained without much decrease, if half the working places in ore are developing new ground, or, as it is often put, if they are advancing. Mining floors, pillars and backs is called retreating.

The average classification of contracts for the past year is given in the following table:-

	<u>"A" Shaft</u>	<u>"B" Shaft</u>	<u>Total</u>
Stopes	15	6	21
Floors	12	11	23
Backs	1	1	2
Drifts and Raises in Ore	4	4	8
Rock	4	3	7
Total	36	25	61

	<u>"A" Shaft</u>	<u>"B" Shaft</u>	<u>Total</u>
Developing New Ore	18	9	27
Mining Known Reserves	14	13	27
Rock	4	3	7
Total	36	25	61

"A" Shaft: Bancroft Ore:
This ore is on Lot 2 of Section 3, and is leased from the Oliver Iron Mining Co.

First Level:
530 feet northwest of "A" shaft a cross-cut was driven to the north, following Diamond-Drill Hole No. 370, and two narrow veins were opened. One is being followed to the west, but has passed out of Bancroft territory into Cliffs Shaft ground.

Fifth Level:
A drift has been driven east for 420 feet in rock parallel to and just north of the boundary line from 1000 east to 1420 east, and two raises are now being put up to ore on the third and fourth levels.

A branch from this drift has been started to the northeast from 1000 east, and will be driven 300 feet to get under some ore found by diamond-drill on the third level.

Sixth Level:
A stope has been driven west 40 feet north of the boundary line for the past year, and is still going ahead in ore 1180 feet northeast of "A" shaft. The east end of this same vein was followed east along the foot-wall by another gang for 70 feet till the end of the old Cliffs Shaft workings was reached at the boundary at 2300 east.

One gang has drifted and stoped east for 220 feet, and has followed a good vein of ore for the last 130 feet. They are 1980 feet southeast of the shaft and are in Moro Mine territory.
Another gang has been raising and stoping in new ore from 1820 to 1280 feet southeast of the shaft near the south boundary. This ore has proved to be more extensive than was expected.
A raise was put up to the elevation of the fourth level, 1650 feet southeast of "A" shaft, but failed to find ore.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
(Continued)

b. Development: (Continued)

"A" Shaft: Bancroft Ore:

Seventh Level:

One gang followed the ore west and north to the end at 1400 east 170 feet north of the boundary, and another has been stoping all year on a sub-level nearly 300 feet further east.

Little definite is known about the geological structure here, but present indications point to a minor syncline with an east and west axis, and the chances of finding ore to the north are good. This is being tested by diamond drill.

Eighth Level:

A raise has been started from a drift just south of the boundary at 1870 east. This drift is also being turned north across the line at 1700 east.

"A" Shaft: Cliffs Shaft Ore:

First Level: North Vein:

One gang is stoping west 610 feet northwest of "A" shaft, following a vein of ore found in Diamond-Drill Hole No. 370.

Second Level: North Vein:

One contract has been stoping west for eight months, following a vein of ore 25 feet wide, 640 feet northwest of "A" shaft.

Fourth Level: North Vein:

One contract followed a vein of ore 15 feet wide for nearly 100 feet to the northwest to its end 420 feet northwest of "A" shaft, and is now mining the floor.

Fourth Level: South-East Deposit:

One gang is raising to the south in good ore near the boundary 1520 feet southeast of "A" shaft.

Another raise 120 feet further east, put up towards the east, ran out of ore a short distance above the level.

Fifth Level: North Vein:

A drift was driven in rock west from 200 east, 810 feet northwest of "A" shaft, to connect with a similar drift from "B" shaft workings. This drift will be used to transfer Bancroft ore to "B" shaft.

Two gangs are stoping on a sub-level at the elevation of the fifth level 2000 feet northeast of "A" shaft, and have fine stopes with ore on all sides. This is a very promising development.

Fifth Level: South-East Deposit:

One gang has drifted and stoped east for 220 feet, and has followed a good vein of ore for the last 120 feet. They are 1980 feet southeast of the shaft and are in Moro Mine territory.

Another gang has been raising and stoping in new ore from 1360 to 1260 feet southeast of the shaft near the south boundary. This ore has proved to be more extensive than was expected.

A raise was put up to the elevation of the fourth level, 1650 feet southeast of "A" shaft, but failed to find ore.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
(Continued)

b. Development: (Continued)

"A" Shaft: Cliffs Shaft Ore:

Sixth Level: North Vein:

The ore along the north boundary, next to the Bancroft lease, 1800 feet northeast of the shaft, was followed to the south and a new vein of smaller size was opened for a length of 100 feet. The ore does not extend far above the level.

At the east end of the level one gang has in the last two months opened a fine stope of ore 2250 feet northeast of the shaft, and another has followed the ore west near the hanging-wall, 200 feet farther southwest.

Sixth Level: South-East Deposit:

One gang has followed the ore east for 100 feet, and now has a good stope 1920 feet southeast of "A" shaft. They have had some rock work, and also raised to the fifth level.

Seventh Level: North Vein:

One gang followed an irregular and narrow vein of ore southwest from 2060 to 1920 feet northeast of "A" shaft, and then cross-cut southeast to the hanging-wall. They found a little ore here, but not enough to mine. This development has been disappointing.

Seventh Level: South-East Deposit:

One gang has followed the hanging-wall east in good ore for 110 feet from 1770 to 1880 feet southeast of "A" shaft, but has apparently reached the end of this ore-body.

Eighth Level: North Vein:

The west drift along the north boundary has been extended west 260 feet, and has now been turned northwest across the boundary into Bancroft territory at 1700 east.

Another drift was driven northeast for 90 feet from the end of the stope 1530 feet northeast of "A" shaft, but struck ore at 50 feet, and opened out a small stope north and south. This ore pinched out, and the drift was started again.

1900 feet east of "A" shaft one contract opened some ore in January, and have followed this ore east and west for 160 feet. The ore does not extend much above the level, but the floor is all ore.

Eighth Level: South-East Deposit:

Two gangs have drifted and stoped east and west along the hanging-wall from their raise 1750 feet southeast of "A" shaft, and have had ore for a length of 290 feet. They drifted through jasper to the northeast and opened another small vein, but this seems now to have ended.

2000 feet southeast of the shaft another gang has been drifting in ore and jasper for 160 feet at the top of two raises put up from the ninth level, trying to find the extension of the Incline Mine Vein. This work has been intermittent, and has been rather discouraging.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
(Continued)

b. Development: (Continued)

"A" Shaft: Cliffs Shaft Ore:

Ninth Level: South-East Deposit:

One raise was put up to the eighth level 2000 feet south-east of "A" shaft.

Tenth Level: Main Vein:

One gang cross-cut north in rock and some ore for 150 feet from the main drift, 1900 feet east of "A" shaft, to find the ore shown in Drill-Holes Nos. 4 and 208, and finally located the ore 50 feet north of the level. They opened a stope in it, and followed it to the ninth level, where they are still raising.

A raise was also put up to the ninth level 1200 feet east of the shaft.

Eleventh Level: Main Vein:

At the east end of the level the ore found in Diamond-Drill Hole No. 332 has been followed northeast in one stope for 140 feet and east in another for 80 feet, but has been cut off by jasper in both places. A drift is now being driven east in this jasper, and another is being driven south in ore seven feet high to find the ore shown in Diamond-Drill Hole No. 331.

Another gang has stoped west from a raise, put up from the twelfth level, for 120 feet, and now has a fine breast of ore 1450 feet east of "A" shaft.

A raise was put up to the tenth level from the stope 1190 feet east of the shaft.

There was no work below the eleventh level.

"B" Shaft: Cliffs Shaft Ore:

First Level: Main Vein:

Two raises were put up 300 and 400 feet southwest of "B" shaft, the first following the hanging-wall and the other the foot-wall, and holed to the stopes above.

On the 1170 foot sub-level the ore has been followed east and west from a raise 600 feet southeast of "B" shaft for a length of 130 feet, and holed to the old workings on the west.

First Level: South Lens:

The southeast drift was driven ahead for 260 feet, the last 30 feet of which was in ore. The breast is now 50 feet north of the south boundary and 1040 feet southeast of "B" shaft.

910 feet southeast of the shaft a raise was put up to the ore on the 1175 foot sub-level.

Third Level: North Vein:

370 feet north of "B" shaft one gang has been stoping and raising in a small body of ore nearly all year.

Fourth Level: North Vein:

During the last two months one gang has cut out on a sub-level half-way between the third and fourth levels 370 feet north of "B" shaft, and is now putting up a branch raise.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
(Continued)

b. Development: (Continued)

"B" shaft: Cliffs shaft Ore:

Fifth Level: North Vein:

360 feet north of "B" shaft a drift was driven east in rock to meet one coming from "A" shaft. This was finished early in the summer.

Sixth Level: North Vein:

Some new ore was found by stoping on a sub-level 700 feet northwest of "B" shaft. Late in the fall a rock-drift was driven under this ore on the sixth level, and its extension was found in December. The ore is narrow at this elevation.

420 feet northeast of the shaft a drift was driven east for 80 feet along a fault, and two cross-cuts were driven to the south, but the quality of the ore found was not satisfactory.

Seventh Level: North Vein:

One gang opened new ore in a stope 100 feet long on the foot-wall 500 feet north of "B" shaft, and is now raising.

Seventh Level: Main Vein:

1200 feet southwest of the shaft a raise was put up to the sixth level.

Eighth Level: North Vein:

The northwest drift was extended 260 feet in jasper, and two raises were put up to the seventh level. A cross-cut was also driven north for 160 feet from the drift 490 feet northwest of "B" shaft, and two more raises were put up to the seventh level. These raises were disappointing, in that the ore in the floors on the seventh level is very shallow.

Eighth Level: Main Vein:

1220 feet southwest of "B" shaft a raise was put up to the seventh level.

Ninth Level: Main Vein:

1230 feet southwest of "B" shaft a raise was put up to the eighth level.

Twelfth Level: Main Vein:

A drift was driven northwest, starting 1570 feet west of "B" shaft, to cut the ore in Diamond-Drill Hole No. 363. This was turned to the north and continued for 100 feet till it struck the Main Vein. The ore has been developed by two cross-cuts and a drift, proving an average width of 70 feet and a length of 150 feet. The hanging-wall is flat and lies close overhead. Two raises have been put up from below, and two gangs are now working here, one on the twelfth level and one on a sub-level ten feet lower down.

Twelfth Level: Fault Vein:

During the second half-year a flat raise has been put up to the east for 90 feet, starting 1250 feet west of the shaft. From this raise ore just below the eleventh level was mined behind the hanging-wall rock of this vein.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
(Continued)

b. Development: (Continued)

"B" Shaft: Cliffs Shaft Ore:

Thirteenth Level: Main Vein:

Two raises were put up early in the year 1580 and 1630 feet west of "B" shaft, and two cross-cuts were driven north and two south from the south stope 1630 and 1700 feet west of the shaft. The ore was cut off by jasper on the north, south and west. Raises have been put up to the top of the ore about 35 feet from these south cross-cuts.

Fourteenth Level: Main Vein:

The stope put up last year from the fifteenth level, 1800 feet northwest of "B" shaft, has been continued to the northeast, and is now almost up to the thirteenth level, 1710 feet northwest of "B" shaft. The ore is not large, but may lead to something better.

c. Stoping:

"A" Shaft: Bancroft Ore:

First Level:

During the first part of the year one gang took down the ore left in the back over the stope 550 to 600 feet north of "A" shaft.

Seventh Level:

Two gangs have been mining the floor of the sixth level 1340 to 1620 feet northeast of "A" shaft. There is still several month's work here.

"A" Shaft: Cliffs Shaft Ore:

Second Level: Main Vein:

One gang has been mining backs and taking down the floor of a sub-level for most of the year 300 to 450 feet northeast of "B" shaft. During the first part of the year they were stoping on the sub-level.

Fifth Level: North Vein:

One gang is mining the floor of the fourth level 350 feet northwest of "A" shaft. There is little ore left here.

Fifth Level: Main Vein:

One gang has been mining the floor of the fourth level intermittently 250 feet west of "A" shaft. This ore is nearly all mined.

Fifth Level: South-East Deposit:

One gang has been mining the floor of the fourth level most of the year 1540 to 1600 feet southeast of "A" shaft.

Sixth Level: North Vein:

One gang has been mining the floor of the fifth level 660 feet northwest of "A" shaft for the past six months.

Seventh Level: North Vein:

One gang is mining the floor of the sixth level 960 feet northeast of the shaft. They are close to the back of the seventh level, and have little more ore to mine here.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
(Continued)

c. Stoping: (Continued)

"A" Shaft: Cliffs Shaft Ore:

Seventh Level: Main Vein:

One gang has mined the ore in the back of the level and above the level on the foot-wall in a series of raises from 2120 to 2400 feet east of the shaft. They have nearly finished this ore.

Eighth Level: North Vein:

Two gangs are mining the floor of the seventh level from 1300 to 1560 feet northeast of "A" shaft.

Another gang mined the floor of the seventh level 250 feet further south for nine months.

Ninth Level: South Lens:

One gang has been stoping on a sub-level and mining the floor of the eighth level 860 feet southeast of "A" shaft.

Tenth Level: Main Vein:

One gang is stoping 1080 feet east of the shaft.

Two gangs are mining the floors of the ninth level 1230 and 1350 feet east of "A" shaft. They are getting out a large tonnage.

Tenth Level: South Lens:

One gang is mining the floor of the ninth level 1040 feet southeast of "A" shaft. This place is pretty well cleaned up, until more raises are put up.

Tenth Level: South-East Deposit:

One gang has been mining the floor of the ninth level from 1210 to 1330 feet southeast of "A" shaft, and are now working in the back of the tenth level.

"B" Shaft: Cliffs Shaft Ore:

First Level: Main Vein:

Two contracts have been mining the floor of the 1190 foot sub-level all year from 340 to 440 feet southwest of "B" shaft and from 440 to 570 feet south of "B" shaft.

First Level: South Lens:

One contract mined the floor of the 1190 and 1175 foot sub-levels 840 feet southeast of the shaft during most of the year.

Second Level: North Vein:

One gang mined the floor of the first level 300 feet north of "B" shaft for two months in the fall.

Sixth Level: North Vein:

One gang has been mining in the back for the past two months 420 feet northeast of the shaft.

Seventh Level: North Vein:

One gang has been mining the floor of the sixth level all year 390 and 340 feet north of the shaft.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
7. (Continued)

c. Stoping: (Continued)

"B" Shaft: Cliffs Shaft Ore:

Eighth Level: Main Vein:

One gang mined the floor of the seventh level for a length of 90 feet 1450 feet southwest of "B" shaft. They are now working above the tenth level.

Ninth Level: Fault Vein:

One gang has mined the floor of the eighth level for 130 feet from 1425 to 1555 feet southwest of "B" shaft.

Ninth Level: Main Vein:

One gang mined the floor of the eighth level for several months 1450 feet southwest of "B" shaft.

Tenth Level: Main Vein:

One gang is mining the floor of the ninth level 1500 feet southwest of "B" shaft.

Twelfth Level: Main Vein:

One gang has mined the floor of the eleventh level for most of the year from 940 to 1040 feet west of the shaft.

Twelfth Level: Fault Vein:

Three gangs have been mining the floor of the eleventh level from 1200 to 1460 feet west of "B" shaft. A large tonnage of good ore at low cost was produced here.

Thirteenth Level: Main Vein:

One gang is mining the floor of the twelfth level 1170 feet west of "B" shaft.

Fourteenth Level: Main Vein:

One gang has been mining the floor of the thirteenth level all of the year 1380 feet northwest of "B" shaft.

Another contract mined the floor 1250 feet northwest of the shaft, before going up to the twelfth level to mine the floor above.

e. Drifting and Raising:

The drifting and raising done in 1927 has been described under "Development."

<u>Year</u>	<u>Rock Drifting</u>	<u>Ore Drifting</u>	<u>Rock Raising</u>	<u>Ore Raising</u>
1926	1561 Ft.	628 Ft.	1490 Ft.	2279 Ft.
1927	3784 Ft.	868 Ft.	1090 Ft.	1626 Ft.

CLIFFS SHAFT MINE
CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

8. COST OF

7. UNDERGROUND:
(Continued)

Cooperative Mining Costs:

f. Explosives, Drilling and Blasting:

Twenty-seven new drills were purchased in 1926, of which fifteen were on E and A. No. 499, and six in 1927.

In the last three months of the year a new bulk powder, Special No. 3, corresponding to the 50% L.F. Standard, has been tried. It breaks the ground satisfactorily and at a saving in first cost, but is causing some trouble with an excessive amount of smoke.

Statement of Explosives Used:

Kind	Quantity	Average Price	Amount	
			1927	1926
50% Powder	228,300	.14	31,962.00	29,558.25
60% Powder	49,550	.15	7,432.50	6,950.75
Special No. 3	22,250	.14	3,115.00	
Total Powder	300,100	.1417	42,509.50	36,509.00
Fuse	434,800	5.817 M.	2,529.30	2,318.21
Caps	92,700	10.65 M.	987.13	813.43
Crimpers	21	.666	13.99	17.99
Total Fuse, Etc.			3,530.42	3,149.63
TOTAL EXPLOSIVES			46,039.92	39,658.63

Product	402,532	340,253
Pounds of Powder per Ton of Ore	.7455	.7516
Cost per Ton for Powder	.1056	.1073
Cost per Ton for Fuse, Etc.	.0088	.0092
Cost per Ton for All Explosives	.1144	.1166
Average Price per Pound for Powder	.1417	.1427

Exploring in Mine:

1926	\$ 8364.59	\$.024
1927	4681.25	.012
Decrease	\$ 3683.34	\$.012

The diamond-drill was leased to the Volcanic Mine for five months in 1927.

In 1926 2297 feet of hole cost \$ 3.44 per foot, and in 1927 1509 feet cost \$ 5.10 per foot.

Development in Rock:

1926	\$ 54847.45	\$.103
1927	54868.90	.126
Increase	\$ 1921.45	\$.023

In 1926 3051 feet cost \$ 11.42 per foot, in 1927 4874 feet cost \$ 11.26 per foot.

Development in Ore:

1926	\$ 25027.95	\$.083
1927	25420.00	.088
Decrease	\$ 2907.98	\$.020

In 1926 2907 feet cost \$ 9.74 per foot. In 1927 2894 feet cost \$ 10.19 per foot.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

8. COST OF OPERATING:

a. Comparative Mining Costs:

	1927	1926	Increase	Decrease
PRODUCT	402,532	340,253	62,279	
Underground Costs	1.333	1.390		.057
Surface Costs	.170	.188		.018
General Mine Accounts	.074	.104		.030
Cost of Production	1.577	1.682		.105
Plant and Equipment	.051	.051		
Taxes	.277	.304		.027
Central Office	.093	.099		.006
Contingent Expense	.050	.046	.004	
Cost Adjustment	.031	.053		.022
Cost on Stockpile	2.079	2.235		.156
Loading and Shipping	.034	.040		.006
Total Cost on Cars	2.113	2.275		.162
No. of Days Operating	291	267	24	
No. of Shifts and Hours	1 - 8	1 - 8		
Average Daily Product	1,383	1,274	109	
COST OF PRODUCTION:				
Labor	1.048	1.063		.015
Supplies	.529	.619		.090
Total	1.577	1.682		.105

b. Detailed Cost Comparison:

(1) Days and Shifts:

The mine worked on single shift five days per week until April 30th, and thereafter worked six days per week. The total number of days was 291, 24 more than in 1926. Hoisting was done overtime in both years as needed. There was no change in the wage-scale in either year.

UNDERGROUND COSTS:

<u>Exploring in Mine:</u>	
1926	\$ 8364.39 \$.024
1927	4681.23 .012
Decrease	\$ 3683.16 \$.012

The diamond-drill was loaned to the Holmes Mine for five months in 1927.

<u>Rock Filling:</u>	
1926	\$ 11165.08 \$.033
1927	11206.95 .033
Increase	\$ 41.87
Decrease	\$.005

In 1926 2297 feet of hole cost \$ 3.64 per foot, and in 1927 1509 feet cost \$ 3.10 per foot.

<u>Development in Rock:</u>	
1926	\$ 34947.45 \$.103
1927	54868.90 .136
Increase	\$ 19921.45 \$.033

In 1926 3051 feet cost \$ 11.45 per foot. In 1927 4874 feet cost \$ 11.26 per foot.

<u>Development in Ore:</u>	
1926	\$ 28327.98 \$.083
1927	25420.00 .063
Decrease	\$ 2907.98 \$.020

In 1926 2907 feet cost \$ 9.74 per foot. In 1927 2494 feet cost \$ 10.19 per foot.

<u>Compressors and Power Drills:</u>	
1926	\$ 3861.75 \$.011
1927	2785.88 .008
Decrease	\$ 1075.87 \$.004

In 1926 twelve new rock drills were changed to take account and in 1927 only six.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

8. COST OF
OPERATING:
(Continued)

UNDERGROUND COSTS: (Continued)

Stopping:
1926 \$ 133519.15 \$.392
1927 157651.93 .392
Increase \$ 24132.78 \$.000

Timbering:
1926 \$ 12735.88 \$.037
1927 10510.06 .026
Decrease \$ 2225.82 \$.011
Increase \$ 5225.82 \$.010

Tramming:
1926 \$ 119596.83 \$.352
1927 143376.36 .356
Increase \$ 23779.53 \$.004

Ventilation:
1926 \$ 3.61 \$.000
1927 64.83 .000
Increase \$ 61.22 \$.000

Pumping:
1926 \$ 25633.55 \$.075
1927 29709.52 .074
Increase \$ 4075.97 \$.001
Decrease \$ \$.001

Compressors and Air Pipes:
1926 \$ 35585.15 \$.105
1927 35199.88 .087
Decrease \$ 385.27 \$.018
Increase \$ \$.002

Back Filling:
1926 \$ 11163.08 \$.033
1927 11206.95 .028
Increase \$ 43.87 \$.005
Decrease \$ \$.005

Underground Superintendence:
1926 \$ 15418.60 \$.045
1927 15913.49 .040
Increase \$ 494.69 \$.005
Decrease \$ \$.005

MAINTENANCE ACCOUNTS:

Compressors and Power Drills:
1926 \$ 3861.75 \$.011
1927 2755.88 .007
Decrease \$ 1105.87 \$.004

The number of contracts increased slightly in 1927, and the mine worked 24 more days than in 1926, and produced 62,279 tons more.

In 1926 the chutes on the eighth and tenth levels in "A" shaft had to be changed and many were rebuilt to fit the new cars. Increased \$ 1894.

In 1927 the mine worked 24 days more than in 1926, and produced 62,279 tons more.

In 1926 new gears cost \$ 1831 and gate valves \$ 102.

The increase is in power charges on account of heavier rainfall. Power charges increased \$ 4035.

The mine worked 24 days more in 1927 than in 1926, but due to running the compressors less at night power charges decreased \$ 1051.

The mine worked 24 days more in 1927 than in 1926.

The mine worked 24 days more in 1927 than in 1926, but did less hoisting overtime.

In 1927 the mine worked 24 days more than in 1926.

The path to the dry was repaired.

In 1926 twelve new rock drills were charged to this account and in 1927 only six.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

8. COST OF OPERATING:
(Continued)

UNDERGROUND COSTS: (Continued)

Hand Traming Equipment:

1926	\$	29793.23	\$	.088
1927		<u>26010.53</u>		<u>.065</u>
Decrease	\$	3782.70	\$	.023

Electric Tram Equipment:

1926	\$	11115.37	\$	.033
1927		<u>17394.16</u>		<u>.043</u>
Increase	\$	6278.79	\$	.010

Pumping Machinery:

1926	\$	3004.22	\$	.009
1927		<u>1842.90</u>		<u>.004</u>
Decrease	\$	1161.32	\$	.005

SURFACE COSTS:

Hoisting:

1926	\$	16962.46	\$	.050
1927		<u>19008.94</u>		<u>.047</u>
Increase	\$	2046.48		
Decrease			\$	.003

Stocking Ore:

1926	\$	9236.81	\$	.027
1927		<u>9356.66</u>		<u>.023</u>
Increase	\$	119.85		
Decrease			\$	.004

Screening-Crushing at Mine:

1926	\$	10227.76	\$	.030
1927		<u>10906.49</u>		<u>.027</u>
Increase	\$	678.73		
Decrease			\$	.003

Dry House:

1926	\$	5905.68	\$	.017
1927		<u>7529.49</u>		<u>.019</u>
Increase	\$	1623.81	\$	.002

General Surface Expense:

1926	\$	7088.71	\$	.021
1927		<u>8276.92</u>		<u>.020</u>
Increase	\$	1188.21		
Decrease			\$	.001

Scrapers and hoists charged out in 1926 cost over \$ 3800, and ten steel car bodies cost \$ 600, but labor decreased over \$ 600 in 1927.

In 1927 a new storage-battery cost \$ 1555.20. Repairs to wheels and armatures and new cells increased \$ 1534. Part payments on new trolley locomotive amounted to \$ 2925 in 1927. Balance is labor charges for wiring.

In 1926 new gears cost \$ 1031 and gate valves \$ 102.

In 1927 the mine worked 24 days more than in 1926, and hoisted 62,279 tons more ore and 6,212 tons more rock.

The mine worked 24 days more in 1927 than in 1926.

The mine worked 24 days more in 1927 than in 1926.

In 1926 Central Office paid \$ 1592 for proportion of heating expense, in 1927 nothing.

In 1927 the mine worked 24 days more than in 1926. The path to the dry was repaired and steps built, and the storage-yard was re-arranged.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

8. COST OF
OPERATING:
(Continued)

SURFACE COSTS: (Continued)

MAINTENANCE ACCOUNTS:

<u>Hoisting Equipment:</u>			
1926	\$	5995.39	\$.018
1927		4251.30	.011
Decrease	\$	1744.09	\$.007

<u>Shaft:</u>			
1926	\$	1205.77	\$.004
1927		1220.50	.003
Increase	\$	14.73	
Decrease			\$.001

<u>Top Tram Equipment:</u>			
1926	\$	3186.69	\$.009
1927		2100.72	.005
Decrease	\$	1085.97	\$.004

<u>Docks, Trestles and Pockets:</u>			
1926	\$	388.46	\$.002
1927		1114.44	.003
Increase	\$	725.98	\$.001

<u>Mine Buildings:</u>			
1926	\$	3807.84	\$.011
1927		4766.07	.012
Increase	\$	958.23	\$.001

GENERAL MINE ACCOUNTS:

<u>Insurance:</u>			
1926	\$	160.80	\$.001
1927		3253.27	.008
Increase	\$	3092.47	\$.007

<u>Engineering:</u>			
1926	\$	2829.59	\$.008
1927		2416.87	.006
Decrease	\$	412.72	\$.002

<u>Analysis:</u>			
1926	\$	2360.92	\$.007
1927		2675.89	.007
Increase	\$	314.97	\$.000

In 1926 3400 ft. of hoisting rope cost \$ 963. In 1927 nothing. One set of coils cost \$ 500 and two pulley-stands were rebuilt.

In 1926 a new gear and pinion cost \$ 425. The decrease is principally in direct charges on E and A. No. 483.

In 1927 both "A" and "B" shaft pockets on surface were repaired.

In 1926 repairs to the shops following fire cost \$ 794, and repairs and decoration at the office cost \$ 210. Direct charges for heating plant on E and A. No. 495 amounted to \$ 178 a month in 1927.

In 1927 a large amount of back insurance was charged out to operations.

This is a Central Office charge.

Central laboratory charges increased \$ 149. Balance is in sampling.

**CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.**

**8. COST OF OPERATING:
(Continued)**

GENERAL MINE ACCOUNTS: (Continued)

Personal Injury Expense:

1926	\$ 13855.62	\$.041
1927	5018.38	.013
Decrease	\$ 8837.24	\$.028

There were two fatal accidents in 1926.

Safety Department Expense:

1926	\$ 112.98	\$.000
1927	132.23	.000
Increase	\$ 19.25	\$.000

Telephones and Safety Devices:

1926	\$ 2459.20	\$.007
1927	2396.15	.006
Decrease	\$ 63.05	\$.001

Local General Welfare:

1926	\$ 914.00	\$.003
1927	1192.80	.003
Increase	\$ 278.80	\$.000

This is a Central Office charge.

Mine Office:

1926	\$ 12726.80	\$.037
1927	12665.69	.032
Decrease	\$ 61.11	\$.005

10. TAXES:

Taxes increased \$ 5,076.76, but the cost per ton was lowered by increased production.

Comparative Statement of Taxes for Years 1926 and 1927

	1927		1926	
	Valuation	Taxes	Valuation	Taxes
Realty placed by Tax Com.	\$ 2,747,250	\$ 90,757.21	\$ 2,277,500	\$ 71,681.00
Personal	510,000	16,843.87	557,000	18,022.22
Lot A, Sec. 2.				
47-27-20 A. Minerals	90,000	2,972.62	29,000	2,912.70
Lot 174, Nelson Addition	100	3.30	100	2.25
Co. SE 21 St. of Lot 179	50	1.65	50	1.50
Total	\$ 3,247,400	110,558.55	\$ 2,133,600	105,633.67
Collection Fees		1,105.50		1,200.00
Total		111,664.05		106,833.67

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

9. EXPLORATIONS
& FUTURE

EXPLORATIONS:

Underground Diamond Drilling:

Only five holes were drilled at the Cliffs Shaft Mine in 1927, as the drill and crew were sent to the Holmes Mine in March and did not return till August. All of the holes drilled were in "A" shaft and they were all horizontal. A detailed description of this drilling will be given in the Geologist's report. A general resume' follows:-

Hole No. 374 was drilled north on the third level from a point 630 feet northeast of "A" shaft, and was in 161 feet on the first of the year. It was stopped at a depth of 270 feet, having had three small runs of ore in the last 109 feet.

Hole No. 375 was also drilled to the north on the third level near the boundary. It is 217 feet west of Hole No. 374, and was in foot-wall material all the way. It was stopped at a depth of 395 feet.

Hole No. 376 was drilled northeast on the seventh level near the boundary 1565 feet northeast of "A" shaft. It was drilled for 116 feet in foot-wall material.

Hole No. 377 was drilled northwest from a Bancroft stope on the seventh level 865 feet northeast of "A" shaft, and was stopped at a depth of 235 feet. It cut one vein of merchantable ore thirteen feet wide.

Hole No. 378 was drilled south for 250 feet from the same stope, starting 65 feet further south, to test the downward extension of ore on the sixth level. It cut 14 feet of good ore at a depth of 6 feet and 5 feet more at a depth of 225 feet. This hole took a month to make five feet in crossing a badly shattered fault-zone.

Hole No. 379 was drilled to the northeast for 404 feet from the same stope 136 feet further east. It had 14 feet of ore at the start, and then passed into the hanging-wall slate, in which it remained for 390 feet.

10. TAXES:

Taxes increased \$ 8,076.76, but the cost per ton was lowered by increased production.

Comparative Statement of Taxes for Years 1927 and 1926:

	<u>1927</u>		<u>1926</u>	
	<u>Valuation</u>	<u>Taxes</u>	<u>Valuation</u>	<u>Taxes</u>
Realty placed by Tax Com.	2,747,250	90,737.21	2,477,800	81,091.02
Personal	510,000	16,843.87	567,000	18,553.22
Lot 2, Sec. 3.				
47-27-60 A. Minerals	90,000	2,972.62	89,000	2,912.70
Lot 174, Nelson Addition	100	3.30	100	3.27
So. 35.91 Ft. of Lot 179	50	1.65	50	1.64
Total	3,347,400	110,558.65	3,133,950	102,561.85
Collection Fees		1,105.58		1,025.62
Total		111,664.23		103,587.47

In 1927 there was a decrease in the amount of coal consumed.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

12. NEW CONSTRUCTION
AND PROPOSED
NEW CONSTRUCTION:

E and A. No. 508:

Certain changes are nearly finished in the crusher building to eliminate the very large chunks from lump ore.

The chute over the big gyratory crusher is being rebuilt and a dumping cylinder for the cars has been erected. It will be necessary to turn the cars around so that the doors are on the south side. In the chute just above the crusher a rotary disc grizzly is being erected, with discs set ten inches apart. The oversize from this grizzly will pass to the big crusher, which has had the mantle and concaves cut down to give a nine-inch opening.

The ore that passes through the ten-inch grizzly falls into another chute in which is another disc grizzly with discs set $3\frac{1}{2}$ inches apart. The oversize from this second grizzly passes directly to the lump pocket, and the undersize goes to the revolving screen below the big crusher.

A new chute and stockpile pocket were erected below the revolving screen, and a new railroad pocket was erected below this chute.

The trestles and the track and pull-back for the crushed ore car have been rearranged for tramping on the east side of the building.

This construction was to have been completed early in the fall, but delay on the part of the railroad in building new tracks, and delay in receipt of material held up construction until the time for erecting stockpile trestles, and since then the carpenters have not been able to spend much time on this work.

The last statement on this E and A. was as follows:-

Acct. No.		Estimate	Expenditures To Date	Unexpended Balance
1	Crusher Changes	\$ 1,500.00	\$ 922.98	\$ 577.02
2	Rotary Grizzlies & Drives	1,500.00	577.41	922.59
3	Trestle Changes & Stockpile Pockets	2,500.00	631.41	1,868.59
4	Chutes & Linings & Building Changes	2,500.00	1,169.72	1,330.28
5	Railroad Pocket	2,000.00	1,433.24	566.76
6	6 Ft. Revolving Screen	8,000.00		8,000.00
7	Contingencies	2,000.00		2,000.00
	Total	\$ 20,000.00	\$ 4,734.76	\$ 15,265.24

E and A. No. 495: Changes in Heating Plants:

These changes were completed in March. Final charges were as follows:-

Acct. No.		Estimate	Total To Date	Unexpended Balance
1	Central Office	\$ 3,825.00	\$ 2,690.29	\$ 1,134.71
2	Cliffs Shaft Mine Office	2,075.00	2,260.45	185.45
3	Shops, Shaft-House & Garage	2,525.00	1,574.59	950.41
4	Miscellaneous	300.00	142.65	157.35
	Total	\$ 8,725.00	\$ 6,667.98	\$ 2,057.02
	10% For Contingencies	872.00		872.00
	Grand Total	\$ 9,597.00	\$ 6,667.98	\$ 2,929.02

In 1927 there was a decrease of 741 tons in the amount of coal consumed.

CLIFFS SHAFT MINE
ANNUAL REPORT
YEAR 1927.

13. NEW EQUIPMENT
AND PROPOSED
NEW EQUIPMENT:

d. Tugger Hoists and Scrapers:

E and A. No. 483 - Underground Equipment: ed practically the same. In 1927 one slide was built for loading cars with scrapers, and is working very satisfactorily. Two more are to be built. Six rocker-dump cars were bought for the fifth level, and two cars were built for the top-tram.

Following is the last statement of this E and A:-
In order to determine the proper elevation for this level five diamond drill-
Acct. were put down from the fourth level, and Total are Unexpended

No.	Estimate	To Date	Balance	
1	Four Storage-Battery Locomotives & Four Scrapers & Slides	\$ 12,800.00	\$ 12,002.43	\$ 797.57
2	Four Top-Tram Cars	3,000.00	2,777.61	222.39
3	Re-Equipping 8th Level "A" Shaft	7,000.00	5,386.24	1,613.76
4	Re-Equipping 10th Level "A" Shaft	9,050.00	6,036.17	3,013.83
5	Re-Equipping 5th Level "A" Shaft		3,150.00	
	Total	\$ 31,850.00	\$ 29,352.45	\$ 2,497.55
	10% For Contingencies	3,185.00		3,185.00
	Grand Total	\$ 35,035.00	\$ 29,352.45	\$ 5,682.55

Two new small storage-battery locomotives with slides and scrapers should be purchased in 1928.

18. NATIONALITY
OF
EMPLOYEES:

The product for the year 1927 was 4,255 tons more than in 1926. All hard ore was screened and produced an average of 2 1/2 tons per day.

Americans -----	39
English -----	38
Irish -----	16
French-Canadian -----	12
Scandinavians -----	80
Finnish -----	94
Italians -----	15
German -----	2
Total -----	286

99% are American citizens, and all speak English. This classification is based on the nationality of the father at birth, and not on the man's nationality at birth. A large proportion are American born, and many are of mixed parentage.

Grade	Pocket	Stockpile	Total	Last Year
Junction Seconder	24,227	23,439	47,666	59,362
Junction	1,261	50,007	51,268	216,523
Total	25,488	110,419	135,907	275,885

Shipments were slightly less than production, so that more ore is on hand than was reported last year, but the increase is small, and there is ample room for all grades this winter, except possibly Helmer Lump.

Shipments began on April 14th and continued intermittently till November 6th.

HOLMES MINE
ANNUAL REPORT
HOLMES MINE

ANNUAL REPORT
YEAR 1927.

PRODUCTION,
SHIPMENTS &
INVENTORIES:
(Continued)

1. GENERAL:

a. Stockpile Inventories:

The general situation at the mine remained practically the same as in 1926 until November, when shaft sinking started. This is carried on at night, and hoisting is done by day.

Development has kept pace with stoping, as far as raising is concerned, but as the working-places are getting down towards the fourth level, it has become necessary to open a new level. In order to determine the proper elevation for this level five diamond drill-holes were put down from the fourth level, and found ore extending 130 feet below the level. The quantity of ore found, however, was not up to expectations.

The mine continued to work on single shift, five days a week, throughout the year, and production was almost exactly the same as in 1926. There was no change in the wage-rate and no shortage of labor in 1927.

2. PRODUCTION,
SHIPMENTS &
INVENTORIES:

a. Production by Months:

Month	Holmes Lump	Holmes Crushed	Junction Bessemer	Junction Total	Total	Rock		
Jan.	2,956	2,734		5,690	14,545	760		
Feb.	2,153	2,827		4,980	14,509	860		
Mar.	2,228	2,226	25,083	27,311	15,486	820		
Apr.	2,804	2,249	38,718	43,771	12,531	860		
May		3,920	44,332	48,252	14,294	880		
June	2,044	3,566	68,361	73,971	13,641	612		
July	Total Ore 109		3,455	176,494	3,819	15,840	824	
Aug.	Rock		2,588	4,053	9,956	4,791	15,708	886
Sept.	1,751	5,211	4,509	5,203	15,394	488		
Oct.							840	
Nov.							840	
Dec.							840	

The product for the year 1927 was 4,266 tons more than in 1926, exclusive of stockpile overruns. All hard ore was screened as of Holmes grade in 1927.

The mine worked 262 days in 1927 and produced an average of 674 tons per day, exclusive of stockpile overruns. In 1926 the mine worked 260 days and produced 660 tons per day.

b. Shipments:

Grade	Holmes Bessemer	Holmes Lump	Holmes Cr.	Junction Bessemer	Junction Total	Last Year Total	Total 1927
On Hand	56,902	2,725	Pocket 74	Stockpile	Total	172,822	172,822
Output for Year		25,083	Tons 718	Tons	Tons	172,822	172,822
Transfer	Holmes Bessemer			26,173	26,173	20,580	
Stockpile	Holmes Lump	13,857		3,723	17,580	13,526	13,180
Total	Holmes Crushed	17,806	18,759	7,077	25,836	49,894	25,688
Ship	Junction Bessemer	7,880	24,227	23,439	47,666	59,562	40,425
Balance	Junction	10,785	10,226	1,262	50,007	51,269	216,933
Decrease in	Total		58,105	110,419	168,524	360,495	
Increase in	Balance on Hand						7,970

Shipments were slightly less than production, so that more ore is on hand than was reported last year, but the increase is small, and there is ample room for all grades this winter, except possibly Holmes Lump.

Shipments began on April 14th and continued intermittently till November 6th.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

2. PRODUCTION,
SHIPMENTS &
INVENTORIES:
(Continued)

c. Stockpile Inventories:

<u>Grade</u>	<u>Tons Lost</u>	<u>Tons</u>	<u>Grade</u>
Holmes Bessemer	180	10,736	Main line trouble.
Holmes Lump		10,226	
Holmes Crushed	Current:	19,556	
Junction Bessemer	Tons Lost	8,034	Grade
Junction	180	94,611	Main line trouble.
Total		143,163	

d. Division of Product by Levels:

Third Level	61.0	130,309 Tons	7.56
Fourth Level	22.0	46,185 "	5.84
Total	83.0	176,494 "	6.72
Rock	58.16	9,956 "	8.06

e. Production by Months:

<u>Month</u>	<u>Days</u>	<u>Holmes Lump Tons</u>	<u>Holmes Crushed Tons</u>	<u>Junction Bessemer Tons</u>	<u>Junction Tons</u>	<u>Total Tons</u>	<u>Rock Tons</u>
Jan.	22	2,036	2,734	4,698	5,075	14,543	760
Feb.	21	2,153	2,827	3,156	6,373	14,509	360
Mar.	23	2,335	3,226	3,300	6,625	15,486	520
April	21	1,604	2,249	2,499	7,179	13,531	560
May	21	1,888	3,080	3,585	5,731	14,284	680
June	23	2,044	3,586	5,296	4,615	15,541	612
July	21	2,109	3,455	4,357	3,619	13,540	524
Aug.	24	2,588	4,053	4,306	4,791	15,738	656
Sept.	21	1,781	3,611	4,609	5,393	15,394	488
Oct.	21	2,145	3,795	3,561	5,197	14,698	840
Nov.	22	2,160	3,270	2,963	6,806	15,199	1,628
Dec.	22	2,240	2,832	3,264	5,695	14,031	2,328
Total	262	25,083	38,718	45,594	67,099	176,494	9,956
Transfers				1,262	1,262		
Year	262	25,083	38,718	44,332	68,361	176,494	9,956

f. Ore Statement:

	<u>Holmes Bess.</u>	<u>Holmes Lump</u>	<u>Holmes Cr.</u>	<u>Junction Bessemer</u>	<u>Junction</u>	<u>Total 1927</u>	<u>Total 1926</u>
On Hand 1-1-27	36,909	2,723	6,674	11,368	77,519	135,193	304,330
Output for Year		25,083	38,718	45,594	67,099	176,494	172,228
Transferred				1,262	1,262		
Stockpile Overrun				13,000	81,000	1,119,000	19,130
Total	36,909	27,806	45,392	55,700	145,880	311,687	495,688
Shipments	26,173	17,580	25,836	47,666	51,269	168,524	360,495
Balance on Hand 10,736	10,226	19,556	8,034	94,611	143,163	135,193	
Decrease in Output						14,864	
Increase in Balance on Hand						7,970	

1927 - 1-8 hour shift 5 days per week, Jan. 1st to Dec. 31st.
 1926 - 1-8 hour shift 5 days per week, Jan. 1st to Dec. 31st.
 1925 - 1-8 hour shift 5 days per week, Jan. 1st to Dec. 31st.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

2. PRODUCTION, SHIPMENTS & INVENTORIES:
(Continued)

Estimated Analysis:

g. Delays:

Date	Hours	Tons Lost	Cause
May 3	2	150	No current. Main line trouble.

h. Delays from Lack of Current:

Date	Hours	Tons Lost	Cause
May 3	2	150	No current. Main line trouble.

3. ANALYSIS:

a. Average Mine Analysis on Output for Year:

Grade	Iron	Phos.	Silica
Holmes Lump	61.69	.043	7.56
Holmes Crushed	62.03	.050	5.84
Junction Bessemer	62.79	.039	4.72
Junction	58.18	.079	8.06

b. Average Analysis on Straight Cargoes for Year 1927:

5. LARGE AND MEDIUM:

All Mixed.

c. High Sulphur Ore:

Some high sulphur ore was found during the year, but it did not cause as much trouble as last year.

4. ESTIMATE OF ORE RESERVES:

a. Developed Ore:

Level	Holmes Bessemer Tons	Holmes Tons	Junction Bessemer Tons	Junction Tons	Total Tons
Third	23,000	10,000	10,000	120,000	163,000
Fourth	60,000	58,000	91,000	535,000	744,000
Total	83,000	68,000	101,000	655,000	907,000

b. Prospective Ore:

Fourth	8,000	12,000			20,000
Fifth			32,000	160,000	192,000
Total	8,000	12,000	32,000	160,000	212,000
Total Ore	91,000	80,000	133,000	815,000	1,119,000

Assumptions:- Hard Ore - 9 cu. ft. per ton.
Soft Ore - 12 cu. ft. per ton.

Deductions of 10% for loss in mining and 10% for rock were made in calculating tonnage.

The ore below the fourth level was recalculated from information obtained in drilling, and shows a reduction of 83,000 tons net, which is almost offset by gains above.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

4. ESTIMATE OF ORE RESERVES:
(Continued)

Comparative Statement of Wages and Product:

c. <u>Estimated Analysis:</u>	1927		1926		Increase		Decrease			
	Iron	Phos.	Sil.	Mang.	Alum.	Lime	Mag.	Sul.	Igni.	Moist.
<u>Holmes Bessemer</u>										
Dried at 212°	61.98	.039	6.56	.179	.267	.410	.179	.007	1.09	
Natural	59.50	.037	6.30	.172	.256	.402	.172	.007	1.05	4.00
<u>Holmes</u>										
Dried at 212°	59.40	.100	8.13	.110	.244	.300	.220	.021	1.41	
Natural	57.08	.096	7.80	.106	.234	.288	.211	.020	1.35	3.90
<u>Junction Bessemer</u>										
Dried at 212°	60.50	.045	7.55	.228	.178	.145	.166	.023	1.52	
Natural	52.94	.039	6.61	.200	.156	.127	.145	.020	1.33	12.50
<u>Junction</u>										
Dried at 212°	56.67	.100	8.50	.244	.283	.141	.161	.029	5.09	
Natural	51.00	.090	7.65	.220	.255	.127	.145	.026	4.58	10.00

5. LABOR AND WAGES:

a. Comments:

1. Labor:

Labor conditions at the mine were satisfactory during the year. The organization contains so many old men, inherited from the Lake and Salisbury Mines, that it feels the need of young blood, and in the past summer a number of young men have been employed, mostly sons of old employees. The number of men was increased in November on account of sinking the shaft. The tons per man was reduced and cost per ton for labor increased.

There were no changes in the wage rate during the year.

<u>AVG. PRODUCT</u>			
MINING & TRAMMING	8.72	9.75	.03
AVG. WAGES CONT. MINERS	5.64	5.59	.07
AVG. WAGES CONT. LABOR	5.64	5.59	.07
<u>TOTAL NO. OF DAYS:</u>			
Surface	12,840	11,715	634
Underground	29,454	27,577	1,857
Total	42,015	39,292	2,781

<u>AMOUNT FOR LABOR:</u>			
Surface	54,900.42	51,692.51	3,217.91
Underground	159,958.64	146,517.85	13,441.09
Total	215,859.06	198,200.36	15,658.64

Proportion Surface to Underground Men:

- 1927 - 1 to 2.49
 - 1926 - 1 to 2.34
 - 1925 - 1 to 2.30
 - 1924 - 1 to 2.23
 - 1923 - 1 to 2.01
 - 1922 - 1 to 2.78
 - 1921 - 1 to 2.65
 - 1920 - 1 to 2.67
- 1927 - 1-8 hr. shift 5 days per week.
 1926 - 1-8 hr. shift 5 days per week.
 1925 - 1-8 hr. shift 5 days per week.
 1924 - 1-8 hr. shift from Jan. 7th.
 1-8 hr. shift 6 days per wk. 7-20 to 12-1.
 1-8 hr. shift 5 days per wk. from 12-1.

*Note: Based on production without stockpile overrun.

** Mine works 22 days per month.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

5. LABOR AND WAGES:
(Continued)

b. Comparative Statement of Wages and Product:

	1927	1926	Increase	Decrease
*PRODUCT	176,494	172,228	4,266	

No. Shifts & Hours 1-8 1-8

AVG. NO. MEN WORKING:

Surface	45	45	0	
Underground	112	106	6	
Total	157	151	6	

AVG. WAGES PER DAY:

Surface	4.37	4.41		.04
Underground	5.39	5.31	.08	
Total	5.09	5.04	.05	

**WAGES PER MO. OF 25 DAYS:

Surface	109.25	110.25		1.00
Underground	134.75	132.75	2.00	
Total	127.25	126.00	1.25	

*PRODUCT PER MAN PER DAY:

Surface	14.06	14.70		.64
Underground	5.99	6.25		.26
Total	4.20	4.38		.18

LABOR COST PER TON:

Surface	.311	.300		.011
Underground	.900	.851		.049
Total	1.211	1.151		.060

AVG. PRODUCT

BREAKING & TRAMMING 8.72 8.75 .03

AVG. WAGES CONT. MINERS 5.66 5.59 .07

AVG. WAGES CONT. LABOR 5.66 5.59 .07

TOTAL NO. OF DAYS:

Surface	12,549	11,715	834	
Underground	29,464	27,577	1,887	
Total	42,013	39,292	2,721	

AMOUNT FOR LABOR:

Surface	54,900.42	51,682.86	3,217.56	
Underground	158,958.64	146,517.56	12,441.08	
Total	213,859.06	198,200.42	15,658.64	

Proportion Surface to Underground Men:

1927 - 1 to 2.49 1927 - 1-8 hr. shift 5 days per week.

1926 - 1 to 2.36 1926 - 1-8 hr. shift 5 days per week.

1925 - 1 to 2.30 1925 - 1-8 hr. shift 5 days per week.

1924 - 1 to 2.23 1924 - 1-8 hr. shift from Jan. 7th.

1923 - 1 to 3.01 1-8 hr. shift 4 das. per wk. 7-30 to 12-1.

1922 - 1 to 2.78 1-8 hr. shift 5 das. per wk. from 12-1.

1921 - 1 to 2.63

1920 - 1 to 2.87

*Note:- Based on production without stockpile overrun.

** Mine works 22 days per month.

7. UNDERGROUND:

a. Shaft

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

6. SURFACE:

a. Buildings and Repairs:

1. Pumps:

In February the centrifugal pump on the fourth level was thoroughly overhauled and repaired.

In July the bearings on the big plunger pump were burned out, and had to be entirely renewed.

The sump was cleaned out in September and October.

2. Screens:

The chutes and screens in the crusher-building were thoroughly overhauled in March.

3. Buildings:

The roofs of all buildings were painted during the summer, and the interiors of the dry and shops were calcimined and painted. The drying-hoods were removed in the dry, and hooks and chains are to be erected in place of the racks.

4. Skip-Hoist:

In April a new pinion was put on the skip-hoist. In November another 400 H.P. motor, taken from the old Salisbury Mine hoist, was added, and two larger pinions were installed, increasing the speed of the skips 150 feet per minute. This has increased the capacity of the hoist about 100 tons a shift. A small air-compressor was erected in December to furnish air for the power-brakes on the hoists, when the big air-compressor is not running.

b. Stockpiles:

The stockpile situation is practically the same as a year ago. The hard ore side is a little crowded, but there is plenty of room on the soft ore side. Four grades, Holmes Lump, Holmes Crushed, Junction Bessemer and Junction are being stocked.

c. Tracks, Roads and Transmission Lines:

On May 3rd lightning struck the main transmission line, and the mine was idle the following day, but worked the next Saturday instead. It also worked at night on May 25th, 26th and 27th on account of shortage of power on day-shift.

d. Subsidence:

The outline of the caved area over the Section 16 and Holmes Mines has not changed materially in the past year, but the ground has gone down a good deal. The west crack on Section 16 is within forty feet of the Chicago and North-Western Ry. tracks. This crack must extend down through the hanging-wall as far as the third level, because the entrance-point of the water on this level has moved west to the line of this crack. It would be wise to move these tracks in 1928.

7. UNDERGROUND:

a. Shaft Sinking:

Shaft-sinking was started on November 7th, using the Athens sinking-cage, hung below the big cage with three ropes and a sliding cross-head. The shaft was sunk 68 feet to the fifth level, the plat was started and the pocket cut, and the shaft is now 12 feet below the level. The skip-pit is to be 62 feet deep.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
(Continued)

a. Shaft Sinking: (Continued)

Two shifts of ten miners, two landers, and a shift-boss are employed, one working from five to twelve, and one from twelve to seven A.M. The rock is hoisted on the sinking cage to the third level, and is there loaded into cars. It is hoisted to surface after seven in the morning, so that no hoisting is done with the skips, while there are men working in the shaft.

b. Development:

Second Outlet:

In November and December a short cross-cut was driven south towards the boundary-line on the fourth level, 25 feet west of Raise 465, and a raise was put up to connect with the seventeenth level of the Section 16 Mine, to serve as a new second outlet.

Third Level:

Raise 316 was put up to the 330 foot sub-level in October, and a third compartment was added to Raise 330 in January.

Raise 368 was put up in rock in the Hard Ore Vein to the 330 foot sub-level, 30 feet west of Raise 367.

On the 330 foot sub-level some new ore has been developed 100 feet east and west of Raise 321.

Fourth Level:

Raises 486 and 488 were put up to the third level from the middle drift east of No. 3 cross-cut, and Raises 419 and 420 between No. 4 and No. 5 cross-cuts.

Raises 425, 430 and 456 were put through to the third level from the foot-wall drift on the fourth level.

One new sub-level, the 250, was opened forty feet below the third level near the southeast corner of the property.

No. 6 cross-cut on the fourth level was advanced 35 feet in slate and quartzite.

c. Stoping:

The number of contracts remained the same as in 1926. The average classification for the year is as follows, not including shaft-work:-

Stopping Level:	-	20	Contracts
Drifting and Raising in Ore	-	14	"
Drifting and Raising in Rock	-	2	"
Total	-	36	"

Third Level:

Hard Ore Vein 14 Contracts
Soft Ore Vein 20 "

Much rock drifting was done by contracts classified as on ore, because it was incidental to their work. For this reason the production of rock from the mine is much larger than the classification would indicate. Over 1000 tons of rock per month was hoisted from the shaft in November and December.

270 Foot Sub-Level:

The hard ore between Raises 462 and 463 for a width of 40 feet north of the boundary has been mined, and two contracts are opening up west and south of Raise 463.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
(Continued)

c. Stoping: (Continued)

Hard Ore Vein:

An average of fourteen contracts was distributed over eleven sub-levels from the 345 foot sub-level on the west at the beginning of the year to the 250 foot sub-level on the east at the end of the year. The 345 and 340 foot sub-levels were finished early in the year, and in December one gang was cutting out on the 250 foot sub-level.

345 Foot Sub-Level:

The ore was mined for 50 feet west of Raise 311 and for 25 feet south. The northern part of the vein from the 330 foot sub-level on the northwest to the 250 foot sub-level on the southeast. The

340 Foot Sub-Level:

The ore north and west of Raise 317 for 70 feet has been finished.

330 Foot Sub-Level:

This sub-level has been nearly finished. There is a little ore left to mine close to Raise 317, and one gang is working on this. The ore has been mined during the year from Raise 317 northwest for nearly 200 feet with an average width of 20 feet.

320 Foot Sub-Level:

At the beginning of the year three gangs were opening up in Raises 361, 363 and 365. The ore has been mined for a length of 280 feet and a width of 50 feet from a point 30 feet east of Raise 361 to a point 50 feet west of Raise 367. The ore probably extends 200 feet further to the northwest, but is much narrower.

310 Foot Sub-Level:

One gang was mining near Raise 360 at the beginning of the year. The ore has been mined from a point 30 feet east of Raise 360 to Raise 363, where it is cut off by a dike.

West of Raise 363 the ore is being opened up by three contracts as far west as Raise 368, a distance of 160 feet. It is much narrower on this sub-level, the hard ore on the north being replaced by soft ore.

300 Foot Sub-Level:

The ore has been mined for 30 feet east and west of Raise 360 and for nearly 50 feet north of the raise.

Third Level:

For nearly 50 feet north and south of the main drift the ore has been mined between No. 3 and No. 5 cross-cuts, a length of 100 feet.

280 Foot Sub-Level:

Some ore had been mined on this sub-level around Raise 462 at the end of last year. It has now been mined as far west as Raise 465 and as far north as Raise 454. Two contracts are working on this sub-level.

270 Foot Sub-Level:

The hard ore between Raises 462 and 463 for a width of 40 feet north of the boundary has been mined, and two contracts are opening up west and south of Raise 463.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
(Continued)

c. Stoping: (Continued)

Hard Ore Vein:

260 Foot Sub-Level:

The ore for 45 feet west of Raise 462 and for a width of 40 feet north of the boundary has been mined.

250 Foot Sub-Level:

One contract is cutting out in Raise 462. The western extension of the same vein is being mined over a length of 160 feet.

Soft Ore Vein:

There are twenty-two contracts working along the foot-wall and in the northern part of the vein from the 330 foot sub-level on the northwest to the 260 foot sub-level on the southeast. The 345 and 340 foot sub-levels were finished early in the year, and some work was done on the 240 and 250 foot sub-levels.

345 Foot Sub-Level:

One gang finished the ore south of Raise 320.

340 Foot Sub-Level:

An irregular ore-body extending from 90 feet west of Raise 321 for 140 feet to the east was mined in the first half-year. A small ore-body was also mined north of Raise 320. South of Raise 320 the ore was mined out against the hanging-wall from a point 15 feet east of Raise 315 to Raise 322.

The only ore remaining on this sub-level is from Raise 315 west. Some of this is high in sulphur, and some is under the railroad tracks.

330 Foot Sub-Level:

Three veins of soft ore have been mined on this sub-level. The northern one extends for 100 feet east and west from Raise 321, but is narrow and irregular. It has been finished west of the raise, but one contract is now working on the east side.

The next vein is 40 feet further south, and is a little wider. It has been mined from a point 35 feet west of Raise 320 to a point 40 feet east of Raise 325, a length of 250 feet with an average width of 25 feet.

The third vein follows the hanging-wall, and is separated from the second vein by a dike. It has an average width of 30 feet, and has been mined for a length of 230 feet as far west as a point 30 feet west of Raise 320. One contract is finishing up here.

Some ore has also been mined along the north side of the hard ore vein near Raise 316.

320 Foot Sub-Level:

The foot-wall vein has been mined for a length of 100 feet and a width of 80 feet between No. 3 and No. 5 cross-cuts on the third level. Three gangs are now opening up from Raises 322 and 325. The ore along the hanging-wall has also been mined from a point 50 feet east of Raise 323 for 100 feet to the west. It was very irregular in outline and analysis.

One gang is drifting west from Raise 316.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
(Continued)

c. Stoping: (Continued)

Soft Ore Vein:

310 Foot Sub-Level:

In the foot-wall vein most of the ore has been mined from a point 25 feet east of Raise 325 for 250 feet east with an average width of nearly 100 feet.

Further south along the hanging-wall a narrow vein was mined for a length of 150 feet, and west of Raise 323, the western extension of the same vein is being mined over a length of 160 feet.

300 Foot Sub-Level:

At the end of last year the foot-wall vein was being opened up from Raises 345, 346 and 348. In 1927 the ore has been mined along the foot-wall as far west as Raise 338, and along the dike on the south as far west as Raise 330, a total length of nearly 300 feet. Three gangs are working to the north and west along the foot-wall.

Third Level:

The ore east and west of Raise 453, 100 feet long, between two dikes has been mined, and also that on the north side of these dikes from Raise 456 east to the foot-wall, a distance of 130 feet. Two gangs are working here, mining the ore to the north.

280 Foot Sub-Level:

At the beginning of the year the ore along the south boundary at the east end of the deposit had been mined for a length of 150 feet and a width of 60 feet. During the year the area mined has been extended 80 feet to the north and as far west as No. 1 cross-cut on the fourth level. Two contracts are opening up on this level in Raises 490 and 451.

270 Foot Sub-Level:

At the end of last year a small amount of ore had been mined east of Raise 461. The ore has since been mined as far west as the hard ore contact near Raise 462 for a width of 65 feet north of the boundary, and there are now five gangs working here, stoping and opening up as far west as No. 1 cross-cut on the fourth level.

260 Foot Sub-Level:

The ore has been mined along the south boundary from the east end, 30 feet east of Raise 460, as far west as Raise 462, a distance of 150 feet, for a width of 40 feet. One gang is working here.

250 Foot Sub-Level:

The ore in Raise 460 was mined along the foot-wall for a length of 80 feet northwest from the boundary and a width of 25 feet. The ore lies between the foot-wall and a dike.

240 Foot Sub-Level:

The ore south of Raise 460 was mined early in the year. The amount mined was insignificant.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
(Continued)

d. Timbering:

The cost of repairing was higher than in 1926. Three gangs were required throughout the year, whereas two only were required up to the fall of 1926.

The 240 foot sub-level has been largely retimbered, and many of the sets on the fourth level have been replaced.

A car of treated timber is on hand for the fifth level.

Statement of Timber Used:

<u>Kind</u>	<u>Linear Feet</u>	<u>Avg. Price Per Foot</u>	<u>Amount</u>	
			<u>1927</u>	<u>1926</u>
6" to 8" Timber	68,233	\$.0387	\$ 2,639.68	\$ 2,960.64
8" to 10" "	64,829	.0608	3,943.47	2,682.51
10" to 12" "	34,050	.0772	2,629.78	2,506.13
12" to 14" "	15,249	.0977	1,489.95	2,018.65
Total 1927	182,361	\$.0586	\$ 10,702.88	
Total 1926	169,638	\$.0599		\$ 10,167.93
5' Lagging	760,750	\$.7425 C.	\$ 5,648.88	\$ 5,709.46
1" Cover. Boards	20,061	.1725 C.	346.06	
Total Lagging	780,811	\$.7677 C.	\$ 5,994.94	\$ 5,709.46
Poles	180,955	1.333 C.	2,412.79	3,236.39
Total Lagging, Poles	961,766	\$.8742 C.	\$ 8,407.73	1,945.85
Total 1926	984,686	\$.8212 C.		\$ 8,945.85
Product			176,494	191,358
Feet of Timber per Ton of Ore			.962	.886
Feet of Lagging per Ton of Ore			4.424	3.696
Feet of Lagging per Ft. of Timber			4.221	4.161
Cost per Ton for Timber			.0606	.0531
Cost per Ton for Lagging			.0339	.0298
Cost per Ton for Poles			.0137	.0169
Cost per Ton for All Timber			.10822	.0998
Feet of Board Measure per Ton of Ore			1.87	1.62
Cost for Timber, Lagging & Poles, 1927			\$ 19,110.61	
Cost for Timber, Lagging & Poles, 1926				\$ 19,113.78

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

7. UNDERGROUND:
(Continued)

e. Drifting and Raising:

Very little rock-drifting was done on main levels in 1927, most of it being in opening work on sub-levels.

Year	Rock Drifting	Ore Drifting	Rock Raising	Ore Raising
1926	1330	314	254	457
1927	585	175	137	731

f. Explosives, Drilling and Blasting:

All hollow steel, except that used in the shaft, was sharpened at the Cliffs Shaft Mine. There has not been much change in the hardness of the ground, the average being about the same as last year.

Statement of Explosives Used for Breaking Ore:

Kind	Quantity	Average Price	Year 1927	Year 1926
50% L.F. Powder	16,200	14.90	2,268.00	
60% " "	65,950	15.00	9,892.50	13,895.00
60% " Gelatin	2,800	15.50	433.25	1,156.03
80% " "				471.00
Total Powder	84,950	14.62	12,593.75	15,522.03

Fuse	230,400	.5623	1,341.75	1,945.65
Caps	58,500	1.065	623.05	850.03
Tamping Bags	15,000	2.083	31.25	61.78
Cap Crimpers	1	1.00	1.00	
Total Fuse, Etc.			1,997.05	2,857.46

b. Detailed Cost Comparison:

Total Explosives			14,590.80	18,379.49
Product			176,494	191,358
Pounds Powder per Ton of Ore			.4813	.5325
Cost per Ton for Powder			.0713	.0811
Cost per Ton for Fuse, Etc.			.0113	.0149
Cost per Ton for Explosives			.0826	.0960
Average Price per Pound for Powder			.1462	.1523

Explosives in Mine:

1926	\$		\$	
1927		2508.76		.014
Increase	\$	2508.76	\$	.014

Sinking in Shaft:

1926	\$		\$	
1927		11628.66		.066
Increase	\$	11628.66	\$	.066

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

8. COST OF OPERATING:

a. Comparative Mining Costs:

	1927	1926	Increase	Decrease
PRODUCT AND COSTS: (Continued)	176,494	191,358*		14,864
Underground Costs	1.455	1.222	In .233	1584 feet cost
Surface Costs	.271	.220	.051	In 1927
General Mine Accounts	.123	.106	.017	at 2.74 per
Cost of Production	1.849	1.548	.301	
Plant and Equipment	.120	.120		
Development	.079	.079	In 1926	771 feet cost
Taxes	.321	.328	.007	62 per foot. 1.00727
Central Office	.113	.100	.013	\$ 6.85 per
Contingent Expense	.061	.044	.017	
Cost Adjustment	.018	.020		.002
Cost on Stockpile	2.561	2.239	.322	was actually
Loading and Shipping	.064	.096		.032
Cost on Cars	2.625	2.335	.290	increase in cost
No. Days Operating	262	260	2	ton in 2
No. Shifts and Hours	1 - 8	1 - 8		overrun taken up in
Average Daily Product	674	736		62
COST OF PRODUCTION:				
Labor	1.207	1.044	.163	had increased
Supplies	.642	.504	.138	The Holmes
Total	1.849	1.548	.301	underground.

*1926 figures include 19,130 tons stockpile overrun. None in 1927.

Without stockpile overrun the cost of production in 1926 was \$ 1.827, as compared with \$ 1.849 in 1927. Taking out shaft sinking, \$.066 per ton, and diamond-drilling, \$.014, in 1927, costs for 1927 show a decrease of \$.058 per ton.

b. Detailed Cost Comparison:

The mine worked the same number of contracts as in 1926, and worked two more days, and produced 4,266 more tons. The two extra days were offset by the delay in hoisting due to shaft-sinking.

Shaft-sinking and repairs to machinery and buildings were higher than in 1926.

Comparison of the different accounts follows:-

UNDERGROUND COSTS:

Exploring in Mine:

1926	\$	\$
1927	2508.76	.014
Increase	\$ 2508.76	\$.014

Sinking in Shaft:

1926	\$	\$
1927	11628.56	.066
Increase	\$ 11628.56	\$.066

1926	\$ 12112.43	\$.055
1927	14364.29	.022
Increase	\$ 2251.86	\$.019

For nearly four months with the centrifugal pump on night shift, on account of a break. In 1927 1370 feet cost \$ 1.83 per foot. No drilling in 1926. extra hoisting engineer. In 1927 pumping was done on night shift for two. In 1927 80 feet cost \$ 145.71 per foot. No sinking in 1926.

In November and December 1927 the compressor worked 24 hours a day, on account of sinking shaft at night. It was running in regularity on day-shift in 1927 on account of diamond-drilling and wire repairs.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

8. COST OF
OPERATING:
(Continued)

UNDERGROUND COSTS: (Continued)

Development in Rock:

1926	\$	11814.84	\$	.062
1927		<u>5600.50</u>		<u>.032</u>
Decrease	\$	6214.34	\$	.030

Development in Ore:

1926	\$	4331.46	\$	.023
1927		<u>8022.36</u>		<u>.045</u>
Increase	\$	3690.90	\$	.022

Stopping:

1926	\$	117861.19	\$	.616
1927		<u>123648.77</u>		<u>.700</u>
Increase	\$	5787.58	\$	.084

Timbering:

1926	\$	42601.14	\$	.223
1927		<u>46209.30</u>		<u>.262</u>
Increase	\$	3608.16	\$	.039

Tramming:

1926	\$	15176.71	\$	.079
1927		<u>14795.79</u>		<u>.085</u>
Decrease	\$	380.92	\$	.002
Increase	\$	7044.31	\$	.006

Ventilation:

1926	\$	220.16	\$	.001
1927		<u>245.92</u>		<u>.001</u>
Increase	\$	25.76	\$	.000

Pumping:

1926	\$	9769.46	\$	.051
1927		<u>8448.27</u>		<u>.048</u>
Decrease	\$	1321.19	\$	.003

Hoisting:

1926	\$	11278.00	\$	.059
1927		<u>12548.00</u>		<u>.072</u>
Increase	\$	1270.00	\$	.013

Compressors and Air Pipes:

1926	\$	12112.43	\$	.063
1927		<u>14564.29</u>		<u>.082</u>
Increase	\$	2451.86	\$	.019

In 1926 1584 feet cost \$ 7.46 per foot. In 1927 722 feet cost \$ 7.76 per foot.

In 1926 771 feet cost \$ 5.62 per foot. In 1927 906 feet cost \$ 8.85 per foot.

The mine actually produced 4,266 tons more in 1927. Increase in cost per ton is due to stock-pile overrun taken up in 1926.

Timber used increased \$ 2269 in 1927. The balance is in repairs underground.

The decrease is due to shorter hauls on the third level and less cleaning up, and to greater concentration of work on the fourth level.

Locomotives	1031	891	840
Wiring	865	562	25
Tracks	1511	932	979
Cars	2422	2332	1150
Total	\$ 7045	\$ 4822	\$ 3525

For nearly four months in 1926 all pumping was done with the centrifugal pump on night shift, on account of a broken shaft on the plunger pump. This required more power and an extra hoisting engineer. In 1927 pumping was done on night shift for two months on account of shortage of power.

In November and December 1927 the compressor worked 24 hours a day, on account of sinking shaft at night. It was running to capacity on day-shift in 1927 on account of diamond-drilling and more scrapers.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

8. COST OF OPERATING:
(Continued)

UNDERGROUND COSTS: (Continued)

Back Filling:

1926	\$	510.71	\$	.003
1927		<u>210.00</u>		<u>.001</u>
Decrease	\$	300.71	\$	.002

Underground Superintendence:

1926	\$	8209.09	\$	.043
1927		<u>7154.43</u>		<u>.041</u>
Decrease	\$	1054.66	\$	.002

Screening-Crushing at Mine:

MAINTENANCE ACCOUNTS: .74 \$.029

Compressors and Power Drills: .018

1926	\$	1616.15	\$	.008
1927		<u>987.71</u>		<u>.006</u>
Decrease	\$	628.44	\$	.002

Hand Trammig Equipment: .033

1926	\$	2548.45	\$	.013
1927		<u>4029.30</u>		<u>.023</u>
Increase	\$	1480.85	\$	.010

General Surface Expense:

Electric Tram Equipment: .024

1926	\$	4521.39	\$	.024
1927		<u>7046.31</u>		<u>.040</u>
Increase	\$	2524.92	\$	.016

MAINTENANCE ACCOUNTS:

Hoisting Equipment: .012

1926	\$	2333.69	\$	.012
1927		<u>4373.39</u>		<u>.022</u>
Increase	\$	2039.70	\$	.010

Pumping Machinery:

1926	\$	2513.47	\$	.013
1927		<u>1623.11</u>		<u>.009</u>
Decrease	\$	890.36	\$	.004

Shaft:

1926	\$	322.19	\$	.002
1927		<u>305.84</u>		<u>.001</u>
Increase	\$	16.35	\$	.001

SURFACE COSTS:

Hoisting:

1926	\$	11278.00	\$	.059
1927		<u>12548.00</u>		<u>.072</u>
Increase	\$	1270.00	\$	.013

Docks, Trestles and Peaksta:

1926	\$	1723.22	\$	.009
1927		<u>1723.20</u>		<u>.010</u>
Decrease	\$	29.92	\$	.001
Increase				.001

In both years the charges were for back-filling in No. 32 contract to make a covering to work under. Less was required in 1927.

1926	Inc.
\$ 2174	\$ 74
\$ 2094	\$ 688
1927	1492
1492	1492
Total	\$ 2222

Repairs to screens were high in 1926 and new cones were In 1926 eight drills cost \$ 1363.30. In 1927 four machines cost \$ 680. Higher prices for coal raised fuel cost \$ 425. al- though In 1927 most of the wooden sub-level cars were replaced with steel cars, and six new scrapers were built.

Supplies increased \$ 121.

Care Charges were as follows:-

	1927	1926	Inc.
Generator	\$ 21	\$ 3	\$ 18
Locomotives	1031	691	340
Wiring	585	562	23
Tracks	1911	932	979
Cars	3498	2333	1165
Total	\$ 7046	\$ 4521	\$ 2525

A new crank-shaft cost \$ 1508 in 1926. In 1927, the centrifugal pump was overhauled, and new bearings and valves were put in the Aldrich pump.

In 1927 hoisting on two shifts at night was carried on in November and December on account of sinking shaft, and more ore was hoisted from the fourth level.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

8. COST OF OPERATING:
(Continued)

SURFACE COSTS: (Continued)

<u>Stocking Ore:</u>		
1926	\$ 7716.37	\$.040
1927	9948.67	.056
Increase	\$ 2232.30	\$.016

GENERAL WINE ACCOUNTS:

<u>Insurance:</u>		
1926	\$ 47.88	\$.000
1927	2223.50	.013
Increase	\$ 2175.62	\$.013

<u>Screening-Crushing at Mine:</u>		
1926	\$ 5488.74	\$.029
1927	3237.10	.018
Decrease	\$ 2251.64	\$.011

<u>Dry House:</u>		
1926	\$ 5244.64	\$.027
1927	5889.37	.033
Increase	\$ 644.73	\$.006

<u>General Surface Expense:</u>		
1926	\$ 6447.37	\$.034
1927	6827.09	.039
Increase	\$ 379.72	\$.005

MAINTENANCE ACCOUNTS:

<u>Hoisting Equipment:</u>		
1926	\$ 2283.69	\$.012
1927	4979.39	.028
Increase	\$ 2695.70	\$.016

<u>Shaft:</u>		
1926	\$ 322.19	\$.002
1927	205.84	.001
Decrease	\$ 116.35	\$.001

<u>Top Tram Equipment:</u>		
1926	\$ 802.06	\$.004
1927	1015.85	.006
Increase	\$ 213.79	\$.002

<u>Docks, Trestles and Pockets:</u>		
1926	\$ 1759.22	\$.009
1927	1729.30	.010
Decrease	\$ 29.92	
Increase		\$.001

There was one more rock-picker employed in 1927. All roofs were painted. Charges were as follows:-

	1927	1926	Inc.
Trestles	\$ 2174	\$ 2098	\$ 76
Opt. Tram	4792	4124	668
Rock Pickers	2982	1494	1488
Total	\$ 9948	\$ 7716	\$ 2232

Repairs to screens were high in 1926 and new concaves were put in crushers.

Higher prices for coal raised fuel cost \$ 422, although consumption decreased 28 tons. Dry-house was charged with a larger proportion of heating expense than in 1926.

Supplies increased \$ 121. Care of office grounds was higher in 1927, and repairs to roads were also higher.

A new skip-rope cost \$ 444 in 1926, and in 1927 a new cage-rope and counter-weight rope cost \$ 734.

Another motor was added to the hoist in 1927, and three new pinions were bought.

Charges are for repairs to pockets underground. Shaft-house railing. Trolley guards.

In 1927 tracks and cars increased \$ 151 and rope \$ 195. Repairs to motors and drums decreased \$ 78, and sheaves and rollers decreased \$ 54.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

8. COST OF OPERATING:
(Continued)

SURFACE COSTS: (Continued)

<u>Mine Buildings:</u>		
1926	\$ 727.89	\$.004
1927	1434.24	.008
Increase	\$ 706.35	\$.004

In 1926 part of the office roof was blown off. In 1927 all roofs were painted, and the dry and shops were calcimined and painted inside.

9. EXPLORATIONS & FUNDS EXPLORATIONS:

GENERAL MINE ACCOUNTS:

<u>Insurance:</u>		
1926	\$ 47.88	\$.000
1927	2223.50	.013
Increase	\$ 2175.62	\$.013

In 1927 a large amount of accumulated insurance from past years was distributed and charged to the operating mines regardless of its source.

<u>Engineering:</u>		
1926	\$ 1582.49	\$.008
1927	1725.32	.010
Increase	\$ 142.83	\$.002

This is a Central Office charge.

<u>Analysis:</u>		
1926	\$ 6744.78	\$.035
1927	6096.92	.035
Decrease	\$ 647.86	\$.000

In 1927 Central Laboratory charges decreased \$ 566. Balance is in sampling.

<u>Personal Injury Expense:</u>		
1926	\$ 2226.51	\$.012
1927	2217.98	.013
Decrease	\$ 8.53	\$.000
Increase		\$.001

<u>Safety Department Expense:</u>		
1926	\$ 224.31	\$.001
1927	238.94	.001
Increase	\$ 14.63	\$.000

<u>Telephones and Safety Devices:</u>		
1926	\$ 100.28	\$.001
1927	314.05	.001
Increase	\$ 213.77	\$.000

The principal items of increase are as follows:-

Scraper-hoist guards	\$ 77.48
Shaft-house railing	14.62
Trolley guards	41.23
Total	\$ 133.33

Balance is underground work.

<u>Local General Welfare:</u>		
1926	\$ 523.95	\$.003
1927	632.50	.003
Increase	\$ 108.55	\$.000

Central Office charge.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

8. COST OF OPERATIONS
OPERATING:
(Continued)

GENERAL MINE ACCOUNTS: (Continued)

<u>Mine Office:</u>					The decrease is due
1926	\$	8861.57	\$	.046	to less time by clerks
1927		<u>8318.37</u>		<u>.047</u>	and less salaries.
Decrease	\$	543.20			
Increase			\$	.001	

9. EXPLORATIONS
& FUTURE
EXPLORATIONS:

Hole No. 25 was drilled northeast from the same cross-cut, 53 feet further northeast, at an angle of forty-five degrees below the horizontal. This hole was in dike for 50 feet and then ore for 40 feet, passing into altered dike and diorite. Total depth 130 feet.

In order to test the ore below the fourth level and to determine the best position for the fifth level, eight diamond-drill holes were put down from the fourth level during the spring and summer of 1927. They proved the existence of ore to a depth of 130 feet below the fourth level in one place, but it is very narrow.

Diamond-drilling in future should be tried again in three places:-

1. Vertically from the end of No. 6 cross-cut on the fourth level, when it has been extended 160 feet farther. This will test for the extension of the Castleford Vein, found in the Section 16 Mine.
 2. Vertically from the east end of the fourth level and horizontally from the east end of the fifth level to see if the main ore-body of the Section 16 Mine pitches west under our foot-wall dike.
 3. Vertically from the fifth level near the shaft to see if there is ore below the diorite in which the shaft is sunk.
- A brief description of the drilling done on the fourth level in 1927 follows:-

Hole No. 21 was drilled to the northeast at an inclination of sixty degrees below the horizontal from the south end of No. 4 cross-cut. It was drilled to a depth of 189 feet in altered dike without finding ore, and then penetrated solid diorite for 12 feet. Total depth 201 feet.

Hole No. 22 was then drilled in the same direction from the same place, but at an angle of thirty degrees below the horizontal. This hole passed into ore at 50 feet, and was in ore for 62 feet. It then went into dike for 55 feet and solid diorite for 41 feet more. Total depth 208 feet.

Hole No. 23 was then drilled to the southwest in the same vertical plane, starting from the center drift. It was drilled at an angle of fifty-nine degrees and was in ore for 79 feet, passing then into dike and at 197 feet into solid diorite. Total depth 240 feet.

The drill was then moved west 140 feet to No. 5 cross-cut, and Hole No. 24 was drilled to the northeast at an angle of forty-three degrees, 100 feet from the end of the cross-cut. This hole was in dike and diorite for 153 feet.

Later Hole No. 27 was drilled southwest in this same vertical plane from the main drift, 30 feet southeast of Raise 419, at an angle of seventy-nine degrees below the horizontal. This hole was in ore for 50 feet and jasper 5 feet, and then went into paint-rock and dike. Total depth 89 feet.

10. EQUIPMENT
& PROPOSED
EQUIPMENT:

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

19. EXPLORATIONS
& FUTURE
EXPLORATIONS:
(Continued)

Hole No. 25 was drilled northeast from No. 6 cross-cut at an angle of fifty-eight degrees below the horizontal. It was in ore for 15 feet, dike for 85 feet, and then ore again for 35 feet, passing into dike again at 135 feet and into diorite at 173 feet. Total depth 186 feet.

Hole No. 26 was then drilled northeast from the same cross-cut, 35 feet further northeast, at an angle of forty-five degrees below the horizontal. This hole was in dike for 50 feet and then ore for 40 feet, passing into altered dike and diorite. Total depth 155 feet.

Hole No. 28 was drilled southwest in the same vertical plane at an angle of seventy-one degrees below the horizontal, starting from the foot-wall drift 60 feet northeast of Hole No. 26. It was in ore for 130 feet and then passed into diorite. Total depth 138 feet.

10. TAXES:

The assessed value of the realty was reduced \$ 259,000, but that of personal property was raised \$ 59,000, in spite of the fact that there was little more than half as much ore in stock on May 1st, 1927 as on May 1st, 1926.

Comparative Statement of Taxes for Years 1927 and 1926:

	<u>1927</u>		<u>1926</u>	
	<u>Valuation</u>	<u>Taxes</u>	<u>Valuation</u>	<u>Taxes</u>
Realty - S.W. $\frac{1}{4}$ of S.E. $\frac{1}{4}$				
Sec. 9-47-27	\$ 608,000	\$ 20,082.69	\$ 867,000	\$ 28,374.36
Personal	1,092,000	36,067.78	1,033,000	33,810.00
Total	\$ 1,700,000	\$ 56,150.47	\$ 1,900,000	\$ 62,184.36
Collection Fees		561.50		621.84
Total		\$ 56,711.97		\$ 62,806.20

13. EQUIPMENT
& PROPOSED
EQUIPMENT:

a. Tugger Hoists and Scrapers:

It is proposed to equip the hard ore contracts with 15 H.P. electric scraper-hoists and scrapers as far as is practicable, some places having too much rock mixed with the ore to permit mechanical loading, and three hoists have already been ordered. By the use of more scrapers the output can be increased with the same number of men, as soon as the shaft and fifth level plat are finished. The improvement in the skip-hoist, made this year, has made this increase possible.

Four air-hoists were received from the Cliffs Shaft Mine early in the year, and one was purchased in the fall from the Stephenson Mine. There is not compressed air capacity for more hoists of this type.

HOLMES MINE
ANNUAL REPORT
YEAR 1927.

13. EQUIPMENT
& PROPOSED
EQUIPMENT:
(Continued)

ANNUAL REPORT
YEAR 1927

b. Cars:

Ten saddle-back cars were purchased from the Stephenson Mine and six rocker-dump cars also, all second-hand equipment. All but two of these cars have gone into service. During the year nearly all of the wooden sub-level cars have been replaced by steel cars of an improved design, which makes shoveling much easier and reduces repairs.

c. Auxiliary Air Compressor: E and A. No. 507:

A small air-compressor and accumulator for operating the main brakes on the hoists was erected in December. Final charges are as follows:-

	Acct. No.	Estimate	Expenditures	Unexpended Balance
1 - Compressor & Tanks		\$ 894.00	\$ 894.00	
2 - Freight & Erecting		200.00	196.05	\$ 3.95
Total		\$ 1094.00	\$ 1090.05	\$ 3.95

16. NATIONALITY
OF
EMPLOYEES:

English -----	73
Irish -----	2
French-Canadian -----	13
Scandinavians -----	34
Finnish -----	57
Italians -----	1
German -----	1
Total -----	181

Year	Lloyd	Lloyddale	Total
1920	105,327	45,000	261,772
1921	104,741	171	209,034
1922	109,227	89,902	221,978
1923			
1924			
1925			
1926	178,118	1,857	35,671
1927	59,281	60,217	326,214

The table that follows shows each grade produced in 1927 in detail:

Grade	Tons
Lloyd	59,281
Lloyddale	60,217
Lloyd Silica	21,079
Harris	178,118
Harris Manganese	1,857
Morrisville	12,753
Total for 1927	526,214

MORRIS-LLOYD MINE

ANNUAL REPORT

YEAR 1927

1. GENERAL:

The Morris-Lloyd Mine again increased its production in 1927, the total being the greatest in the history of the property. The tons per man per day, however, will not be up to the 1926 mark, due to the sinking of the Morris shaft, due to putting up second outlet in rock from the sixth to fourth level, and also because of the fact that so many of the regular working places in the Morris shaft had to be abandoned after the concrete dams were built and new territory opened up by raising.

We added to our ore reserves principally by development work in the main ore deposit on Chase Lease No. 9 on the 7th level. We also found the ore to extend over onto the old Iron Cliffs Co.'s lands South of Chase Lease No. 9.

Production from the leases was increased over last year, the total being approximately twice the minimum called for.

Additional scrapers were added until finally in November, the statements show that all of the product for that month was loaded mechanically.

Shipments were a little better than the year before but we show more left in stock due to larger production.

2. PRODUCTION, SHIPMENTS & STOCKPILE BALANCES:

a. Production by Grades:

The following table shows ore produced each year since 1920:-

Year	Morris	Manganese	Silica	Lloyd	Lloyddale	Total
1920	45,572		63,873	105,327	45,000	261,772
1921	68,593		45,529	84,741	171	209,034
1922	109,227		22,850	89,902		221,979
1923	132,413		25,147	101,145	1,630	260,335
1924	76,038		69,253	88,672	12,393	246,356
1925	100,568		59,945	105,316		265,829
1926	110,863	3,436	53,088	49,678	73,097	290,162
1927	173,118	1,357	33,871	58,251	60,217	326,814

The table that follows shows each grade produced in 1927 in detail:

Grade	Tons
Lloyd	58,251
Lloyddale	60,217
Lloyd Silica	21,078
Morris	173,118
Morris Manganese	1,357
Morrisville	12,793
Total for 1927	326,814

c. Stockpile Balances:

Year	Morris	Manganese	Silica	Lloyd	Lloyddale	Total
1920	26,917		39,956	78,821	39,077	226,169
1921	87,871		45,529	75,992	42,671	229,363
1922	65,658		59,551	51,250	44,184	257,417
1923	137,758		31,985	122,977	12,317	347,030
1924	186,709		5,568	117,373	14,622	324,189
1925	184,842		15,709	164,745	14,500	379,676
1926	194,820		34,743	164,745	4,354	418,519
1927	219,820	1,357	33,784	164,399	12,900	432,159

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

2. PRODUCTION,
SHIPMENTS &
STOCKPILE BALANCES:
(Continued)

b. Shipments: from Chase Leases by Months:

Shipments were a little better than last year but still far from the total we would like to forward.

Shipments by Grades:

Grades	1922	1923	1924	1925	1926	1927
Morris	118,858	45,394	27,084	122,435	86,413	148,118
Morris Manganese					3,259	86
Morrisville	8,117	39,773	80,975	28,673	12,372	15,790
Lloyd	96,571	80,267	104,115	67,953	33,948	58,615
Lloyddale	42,742	20,390	25,171		67,119	53,641
Lloyd Silica	27,627	24,868	31,883	21,084	21,664	21,038
Total	293,915	210,692	269,228	240,145	224,775	297,288

Shipments as forwarded from pockets and stockpiles were as follows:

Grade	Pocket	Stockpile	Total
Lloyd	25,573	33,042	58,615
Lloyddale	23,678	29,963	53,641
Lloyd Silica	18,875	2,163	21,038
Morris	82,639	65,479	148,118
Morrisville	51	15,739	15,790
Morris Manganese	86		86
Total	150,902	146,386	297,288

The ores shipped in 1927 were consigned to the docks and various charcoal furnaces as shown:-

Destination	Grade					
	Lloyd	Lloyddale	Lloyd Silica	Morris	Morrisville	Morris Mang.
L. S. & I. Dock	22,686	52,921	409	103,804	12,244	
C. & N. W. "	10,174	720		1,886	3,546	
Antrim Iron Co.			4,211	14,793		
Cadillac Furnace			1,421	8,201		
East Jordan "			749			
Newberry "			4,831	13,073		
Pioneer #2 "	11,641		5,687	6,361		86
Wells "	14,114		3,730			
Total	58,615	53,641	21,038	148,118	15,790	86

c. Stockpile Balances:

Balances Shown as of Dec. 31st each year:

Year	Morris	Morris Mang.	Morrisville	Lloyd	Lloyddale	Lloyd Silica	Total
1920	26,917		52,514	33,840	73,821	39,077	226,169
1921	87,371		74,849	90,270	73,992	42,871	369,353
1922	65,658		59,651	96,674	31,250	44,184	297,417
1923	137,758		31,985	132,977	12,417	31,923	347,060
1924	186,709		5,568	117,373		14,538	324,188
1925	164,842		15,759	154,733		14,538	349,872
1926	194,820		34,783	164,763	6,354	14,538	415,259
1927	219,820	1,271	31,786	164,399	12,930	14,579	444,785

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

2. PRODUCTION,
SHIPMENTS &
STOCKPILE BALANCES:
(Continued)

e. Production from Chase Leases by Months:

Leases	No. 9	No. 24	No. 25	No. 26	Nos. 27 & 28	Total
Minimum Yearly Tonnages Required	10,000	15,000	15,000	15,000	22,500	77,500
January	2,854	4,648	979		0	8,481
February	4,488	5,193	832	302	0	10,815
March	5,468	6,083	1,811		0	13,362
April	5,458	2,774	1,054		0	9,286
May	7,310	4,422	647	233	0	12,612
June	8,217	4,530	1,263	199	0	14,209
July	8,177	3,756	1,357		0	13,290
August	8,965	3,614	1,040		0	13,619
September	9,052	2,894	981	202	0	13,129
October	9,320	2,904			0	12,224
November	8,053	3,495			0	11,548
December	9,562	3,951			0	13,513
Totals	86,924	48,264	9,964	936	0	146,088
Over-run	2,032	667	76	16	0	2,791
Grand Total	88,956	48,931	10,040	952	0	148,879

Production from Leases by Years:

This table is added to show how production from the Chase Leases is being gradually increased to offset royalties accrued since 1908. For the period 1908 to 1922, the minimums over balanced the production, but for the past six years, we have exceeded the annual requirements.

Lease No.	9	24	25	26	27	28	Totals
Minimums	10,000	15,000	15,000	15,000	15,000	7,500	77,500
Year							
1920	33,411	19,073	1,527	1,320	0	0	55,331
1921	56,794	12,075	4,843	2,075	176	0	75,963
1922	97,082	6,980	2,057	0	0	0	106,119
1923	104,522	9,148	7,109	1,831	0	0	122,610
1924	97,123	13,047	699	137	2	0	111,008
1925	77,244	29,526	10,367	2,425	0	0	119,562
1926	53,102	47,876	14,604	303	0	0	115,885
1927	88,956	48,931	10,040	952	0	0	148,879

Total Royalties Accrued and Production from Leases:

No. of Lease	Accrued		Mined	Balance
	To Dec. 31, 1927	To Dec. 31, 1927	To Dec. 31, 1927	
9	192,283		888,267	695,984
24	271,088		194,058	77,030
25	271,068		51,246	219,842
26	261,713		9,043	252,670
27	239,213		178	239,035
28	119,607		0	119,607
Totals	1,354,992		1,142,792	212,200

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

2. PRODUCTION,
SHIPMENTS &
STOCKPILE BALANCES:
(Continued)

e. Table Showing Balances Due on Accrued Royalties For Leases Nos. 9 to 28 Inclusive For Past Few Years:

Year	Tons	Tons	Balance
	Accrued	Mined	
1920	812,492	342,766	469,726
1921	889,992	418,729	471,263
1922	967,492	524,848	442,644
1923	1,044,992	647,458	397,534
1924	1,122,492	758,466	364,026
1925	1,199,992	878,028	321,964
1926	1,277,492	993,913	283,579
1927	1,354,992	1,142,792	212,200

f. Ore Statement:

	Morris	Morrisville	Morris Mang.	Lloyd	Lloyd-dale	Lloyd Silica	Total
On Hand Jan.1,1927	194,820	34,783		164,763	6,354	14,539	415,259
Produced in 1927	160,911	19,685	1,357	88,587	41,863	14,411	326,814
Total	355,731	54,468	1,357	253,350	48,217	28,950	742,073
Transfers	12,207	6,892		30,336	18,354	6,667	
Net Total	367,938	47,576	1,357	223,014	66,571	35,617	742,073
Shipments	148,118	15,790	86	58,615	53,641	21,038	297,288
Balance on Hand	219,820	31,786	1,271	164,399	12,930	14,579	444,785

g. Delays:

Date	Cause of Delay	Loss of Production
Jan. 3rd,	Morris shaft not working. Changing Skip Hoist.	250 Tons
" 4th,	" " " " " " " " " "	250 "
" 5th,	" " " " " " " " " "	250 "
" 6th,	" " " " " " " " " "	250 "
Apr.26th,	16 Hours delay at Morris Shaft due to cage hoist breaking down.	200 "
Dec. 8th,	Mine idle due to snow storm.	1,000 "
	Total Loss of Production	2,200 Tons

3. ANALYSIS:

Average Mine Analysis on Output For Year 1927:

Grade	Iron	Phos	Silica
Lloyd	58.57	.107	6.63
Lloyd-dale	58.62	.160	6.40
Lloyd Silica	52.30	.083	15.29
Morris	58.97	.096	7.11
Morrisville	51.71	.066	18.44
Morris High-Manganese	60.48	.060	7.39

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

3. ANALYSIS:

(Continued)

Average Mine Analysis for Year 1927:Ores Shipped:

Grade		Iron	Phos	Silica	Moisture
Morris	Dried	58.70	.097	7.15	10.75
	Natural	52.40	.087	6.38	
Morrisville	Dried	49.90	.062	19.86	10.50
	Natural	44.65	.056	17.77	
Lloyd	Dried	58.50	.116	6.08	12.30
	Natural	51.30	.102	5.35	
Lloyddale	Dried	58.30	.148	6.31	12.30
	Natural	51.14	.130	5.53	
Lloyd Silica	Dried	52.00	.081	15.85	11.00
	Natural	46.28	.072	14.10	

Ores Stocked:

Grade		Iron	Phos	Silica	Moisture
Morris	Dried	58.35	.100	7.42	10.75
	Natural	52.08	.089	6.63	
Morris Manganese	Dried	60.30	.060	6.51	10.50
	Natural	53.96	.054	5.83	
Morrisville	Dried	51.00	.068	18.84	10.50
	Natural	46.00	.061	16.86	
Lloyd	Dried	58.25	.111	6.50	12.30
	Natural	51.08	.097	5.70	

Average Analysis on Straight Cargoes For Year 1927:

Grade	Mine		Lake Erie
	Iron	Phos	
Lloyd	58.25	.113	None
Lloyddale	All Mixed		
Lloyd Silica	" "		
Morris	58.56	.080	
Morrisville	50.26	.067	

4. ESTIMATE OF ORE RESERVES:

	Lloyd	Lloyddale	Total Tons
<u>DEVELOPED ORE</u>			
Factor:- 12 cu. ft. per ton	28,145	145,227	173,372
10% deduction for rock	6,927	95,594	102,521
10% " " loss in mining	1,038	108,120	109,082
Above and Below 4th Level,	21,179	596,518	817,697
Total Developed Ore	260,387	940,519	1,200,906
<u>PROSPECTIVE ORE</u>			
Above 4th Main Sub,	8,405	23,081	31,486
Total Prospective Ore	8,405	23,081	31,486
Total Ore in Lloyd Mine East	268,792	963,600	1,232,392

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

4. ESTIMATE OF ORE RESERVES:
(Continued)

Following is the estimate showing ore in sight Dec. 31, 1927 that can be mined.

MORRIS MINE

Location of Ore	Bessemer	Morris	Total Tons
<u>DEVELOPED ORE</u>			
Above 6th Level, C.C.I.Co. Lands,		31,253	31,253
" " " Chase Lease No.9,		59,245	59,245
" 7th " C.C.I.Co. Lands,	42,332	151,836	194,168
" " " Chase Lease No.9,	52,181	503,037	555,218
" " " " " No.24,		63,413	63,413
" " " " " No.25,		22,937	22,937
" " " " " No.26,		9,687	9,687
Below " " C.C.I.Co. Lands,	15,284	57,286	72,570
" " " Chase Lease No.9,	28,164	107,738	135,902
" " " " " No.24,		18,394	18,394
" " " " " No.25,		10,336	10,336
" " " " " No.26,		16,453	16,453
Total Developed Ore	137,961	1,051,615	1,189,576
<u>PROSPECTIVE ORE</u>			
Above 7th Level, C.C.I.Co. Lands,		78,840	78,840
" " " Chase Lease No.9,		21,600	21,600
Total Prospective Ore		100,440	100,440
Total Ore in Morris Mine	137,961	1,152,055	1,290,016

LLOYD MINE

Location of Ore	Lloyd	Lloydale	Total Tons
<u>DEVELOPED ORE</u>			
Above 3rd Level,	87,227		87,277
<u>PROSPECTIVE ORE</u>			
Below 3rd Level,	6,185		6,185
Total Ore in Lloyd Mine	93,412		93,412

LLOYD MINE EAST

Location of Ore	Lloyd	Lloydale	Total Tons
<u>DEVELOPED ORE</u>			
Above 3rd Main Sub,	22,145	143,227	165,372
" 4th " "	6,927	95,594	102,521
Between 3rd Level & 4th Main Sub,	14,038	103,180	117,218
Above and Below 4th Level,	216,977	598,518	815,495
Total Developed Ore	260,087	940,519	1,200,606
<u>PROSPECTIVE ORE</u>			
Above 4th Main Sub,	8,606	20,082	28,688
Total Prospective Ore	8,606	20,082	28,688
Total Ore in Lloyd Mine East	268,693	960,601	1,229,294

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

4. ESTIMATE OF ORE RESERVES:
(Continued)

SUMMARY OF TOTAL ORE

Mine	Bessemer	Morris & Lloyd	Lloyddale	Total Tons
Morris	137,961	1,152,055		1,290,016
Lloyd		93,412		93,412
Lloyd East		268,693	960,601	1,229,294
Total	137,961	1,514,160	960,601	2,612,722

	MORRIS MINE		TOTAL	LLOYD & LLOYD EAST		TOTAL	GRAND
	BESSEMER	MORRIS	MORRIS MINE	LLOYD	LLOYDDALE	LLOYD EAST	TOTAL TONS
Total Ore Developed	137,961	1,051,615	1,189,576	347,314	940,519	1,287,833	2,477,409
" " Prospective		100,440	100,440	14,791	20,082	34,873	135,313
Total	137,961	1,152,055	1,290,016	362,105	960,601	1,322,706	2,612,722

Total Ore on Chase Lease No. 9, -	771,965 Tons
" " " " " No.24, -	81,807 "
" " " " " No.25, -	33,273 "
" " " " " No.26, -	26,140 "
Total Ore on All Leases,	913,185 "
Total Ore on C.C.I.Co. Lands,	1,699,537 "
Total Ore in Morris-Lloyd Mines,	2,612,722 Tons

The following table shows the above tonnages sub-divided into grades as reported to the Tax Commission.

Developed Ore	Morris Shaft	Lloyd Shaft	Total
Bessemer	137,961		137,961
Non-Bessemer	1,051,615	1,287,833	2,339,448
Siliceous			
Total	1,189,576	1,287,833	2,477,409
Prospective Ore			
Bessemer			
Non-Bessemer	100,440	34,873	135,313
Siliceous			
Total	100,440	34,873	135,313
Grand Total	1,290,016	1,322,706	2,612,722

Wages Per Month of 25 Days:

	1927	1926	Increase	Decrease
Surface	126.25	125.00	.25	
Underground	128.50	125.00	3.50	
Total	125.50	121.50	4.00	

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

4. ESTIMATE OF ORE RESERVES:

(Continued)

Ore Reserves:

The following table gives the ore in sight January 1st; product for year; balance in sight and new ore developed during the year.

Estimated Ore	1923	1924	1925	1926	1927
Ore in Mine Jan. 1st.	3,309,174	3,306,270	3,309,075	3,325,341	2,891,893
Production	260,335	246,356	265,829	290,162	326,814
Balance	3,048,839	3,059,914	3,043,246	3,035,179	2,565,079
Ore in Mine Dec. 31st.	3,306,270	3,309,075	3,325,341	2,891,893	2,612,722
New Ore Developed	257,431	249,161	282,095	143,286	47,643

5. LABOR AND WAGES:

a. General:

Labor conditions were very satisfactory for the year. Men were more abundant than jobs and a great many men applied daily for work.

b. Comparative Statements:

Product - Shifts - Hours:

	1927	1926	Increase
Product	326,814	290,162	36,652
No. of Shifts & Hours	1-8 Hr.	1-8 Hr.	

Average Number of Men Working:

Year	Surface	Underground	Total
1921	46	203	249
1922	48	162	210
1923	44	156	200
1924	44	144	188
1925	45	145	190
1926	45	149	194
1927	50	178	228

Increase for 1927 - 34 Men

Average Wages Per Day:

Year	Surface	Underground	Total
1922	3.72	4.19	4.08
1923	4.12	4.65	4.53
1924	4.29	4.94	4.78
1925	4.34	5.02	4.86
1926	4.32	5.02	4.85
1927	4.33	5.14	4.94
Increase for 1927	0.01	0.12	0.09

Wages Per Month of 25 Days:

	1927	1926	Increase	Decrease
Surface	108.25	108.00	.25	
Underground	128.50	125.50	3.00	
Total	123.50	121.25	2.25	

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

5. LABOR AND WAGES:

b. Comparative Statements:

Product - Shifts - Hours:

(Continued)

Product Per Man Per Day:

Year	Surface	Underground	Total
1920	17.67	4.33	3.48
1921	18.78	4.22	3.44
1922	17.40	5.33	4.08
1923	18.47	5.58	4.28
1924	19.08	6.42	4.80
1925	20.45	6.85	5.13
1926	21.42	6.97	5.26
1927	20.93	6.61	5.02
Decrease for 1927	.49	.36	.24

The decrease for 1927 is due to extra men employed on development work and sinking Morris Shaft. If it had not been for these men, our record would have shown an improvement over last year. As proof for this, the tons of ore mined per man per day stoping and drifting in ore shows an increase over last year as will be noted from the following table.

Tons Ore Mined Per Man Per Day:

	1927	1926
Stoping	17.46	17.33
Development in Ore	11.18	8.90
Total	16.73	16.54

Labor Cost Per Ton:

Year	Surface	Underground	Total
1920	.307	1.482	1.791
1921	.242	1.248	1.490
1922	.214	.786	1.000
1923	.223	.834	1.057
1924	.225	.770	.995
1925	.212	.733	.945
1926	.201	.721	.922
1927	.207	.777	.984
Increase for 1927	.006	.056	.062

	1927	1926	Increase	Decrease
Average Product Stoping & Trammig	12.04	11.76	0.28	
" Wages Contract Miners	5.80	5.45	0.35	

b. Stockpile Facilities:

We extended the Morris stockpile area N. E. of the shaft to a point directly North of the Lloyd shaft. Ore is being stockpiled in the old yard adjacent to the boarding houses.

The old Morris pile near the mine office was cleaned up and that area is now reserved for High Blastings ore.

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

5. LABOR AND WAGES:

b. Comparative Statements:

Product - Shifts - Hours:

(Continued)

Total Number of Days Labor Statement:

Year	Surface	Underground	Total
1922	12,715 $\frac{1}{2}$	41,618 $\frac{1}{2}$	54,333 $\frac{1}{2}$
1923	14,083	46,666 $\frac{1}{2}$	60,749 $\frac{1}{2}$
1924	12,911 $\frac{1}{2}$	38,384 $\frac{1}{2}$	51,296 $\frac{1}{2}$
1925	12,988	38,798 $\frac{1}{2}$	51,796 $\frac{1}{2}$
1926	13,544 $\frac{3}{4}$	41,616	55,160 $\frac{3}{4}$
1927	15,618	49,479 $\frac{1}{2}$	65,097 $\frac{1}{2}$
Increase for 1927	2,073 $\frac{1}{4}$	7,863 $\frac{1}{2}$	9,936 $\frac{3}{4}$

Amount For Labor:

Year	Surface	Underground	Total
1922	\$47,387.29	\$174,481.44	\$221,868.73
1923	58,007.55	217,099.94	275,107.49
1924	55,422.26	189,689.21	245,111.47
1925	56,432.49	194,847.06	251,279.55
1926	58,448.93	208,934.14	267,383.07
1927	67,551.48	254,175.60	321,727.08
Increase for 1927	\$ 9,102.55	\$ 45,241.46	\$ 54,344.01

Proportion Surface to Underground Men:

1924	1 to 3.27
1925	1 to 3.22
1926	1 to 3.31
1927	1 to 3.56

6. SURFACE:

a. Buildings:

The top tram building at the Lloyd shaft was rebuilt and made into a fire proof structure.

At the Morris shaft, the new crusher was covered and the new structure built was made large enough to house the top tram control apparatus. The pockets and the frame building around the crusher were gunited.

Both the exposed portions of the timber tunnels at the Morris and Lloyd shafts were torn down and rebuilt. We likewise extended the tunnel far enough into the Morris timber yard to cover the frog and switch leading to the side track.

At the Section Six Mine, we repaired and rebuilt a portion of the wood head frame.

b. Stockpile Trestles:

We extended the Morris stockpile area N. E. of the shaft to a point directly North of the Lloyd shaft. Ore is being stocked in the old yard adjacent to the boarding houses.

The old Morris pile near the mine office was cleaned up and that area is now reserved for High Manganese ore.

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

6. SURFACE:

c. Tracks, Roads Etc.:

We have extended the snow fences erected last year and in order to protect the timber yards still further, the railway company spotted ore cars on all the side tracks not in use.

7. UNDERGROUND:

a. Shaft Sinking:

The Morris shaft was sunk to a point 26 $\frac{1}{2}$ feet below the 7th level. Sinking was started under the ladder and pipe compartment below the 7th level, a rock pentice under the skip and cage roads being left in place to safeguard the men below. Below the pentice, the shaft is sunk full size and all the timber and guides are in place.

No particular trouble was experienced until the elevation of the 8th level plat was reached. At this point, the slate was badly shattered and full of slips and a large concrete arch was built over the storage pockets to make the back safe. Opposite the cage road, a double tier of 12" x 12" Fir timber was thrown across the South side of the plat to catch up the loose in the back.

Below the 8th level, the shaft and room for the pockets is being cut at the same time.

b. Development:

We drifted a total of 401 feet in rock, most of the drifting for the year being in ore. We discontinued the old system of driving small development drifts in ore and did all that sort of work with full sub level drifts, using scrapers to handle the dirt. Following are the figures for the last two years showing the amount of drifting and raising in ore.

Year	Ore Drifting	Ore Raising
1926	2249	1703
1927	2210	2232

As usual, most of the above footage was confined to the Morris shaft.

It is interesting to note how the adoption of scrapers in the development drifts has raised the tons per man. In 1926, the tons per man was 8.90 compared with 11.18 in 1927. All of the increase had to come from the drifts as we have not increased the efficiency of the raising gangs.

c. Stoping:

Due to the fact that most of the gangs in 1926 were already equipped with scrapers, it was not possible to increase the stoping tons per man very much, but the average for 1927 is a little better than it was in the previous year.

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

7. UNDERGROUND:c. Stoping:

(Continued)

Stoping Tons Per Man:

Year	Tons Per Man	Avg. Price Per Foot	Amount 1927	Amount 1926
1919	8.75			
1920	9.27			
1921	10.20			
1922	13.82	.044	3,520.51	3,039.18
1923	15.54	.058	4,140.58	4,206.27
1924	15.67	.086	5,006.14	4,561.63
1925	17.10	.106	487.76	650.43
1926	17.53	.521	1,697.02	177.07
1927	17.46	.0695	14,550.96	12,434.50

Although the average for the year does not show much improvement over last year, the monthly averages indicate that we showed vast improvement during the last half of the year.

Year 1927			Amount 1927	Amount 1926
Jan.	15.40			
Feb.	16.89			
Mar.	17.16			
Apr.	16.32			
May	16.85			
June	17.21			
July	17.31			
Aug.	18.17		325,814	290,162
Sep.	18.97		.66	.649
Oct.	19.16		3.07	3.28
Nov.	18.15		2.85	5.06
Dec.	18.00		.0457	.0429

The average for the first six months was only 16.65, while the last six months shows an average of 18.34.

d. Timbering:

The timbering cost shows an increase over the previous year due to the fact that practically all of the ore mined in 1927 was scraped and taken out by the regular sub level top slicing system. For a number of years previous to 1926 and for the first half 1926, a considerable portion of the production came from #24 sub-stope on the sixth level Morris shaft.

We are using treated timber also for all main level drifts and the cost of this timber is double the raw timber. Naturally the unit cost increased but we expect to show a saving eventually due to the longer life of treated timber.

The consumption of covering poles also continued heavy due to lagging down the floors in all sub levels with poles instead of covering boards. On all new subs started under the hanging, two layers of poles are used, the (9½') nine and one-half foot poles being laid lengthwise and (8') eight foot poles crosswise.

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

7. UNDERGROUND:

d. Timbering:

(Continued)

Timber Statement:

The following statement shows the various quantities of timber used during 1927.

	Lineal Feet	Avg. Price Per Foot	Amount	
			1927	1926
6" to 8" Timber	82,579	.044	3,620.51	3,039.18
8" to 10" "	65,362	.063	4,140.53	4,206.27
10" to 12" "	57,944	.086	5,005.14	4,361.63
12" to 14" "	4,616	.106	487.76	650.45
Treated Stulls	5,291	.321	1,697.02	177.07
Total Timber 1927	215,792	.0693	14,950.96	12,434.60
" " 1926	188,202	.0661	12,434.60	
		Per 100'		
5' Lagging	420,113	.776	3,260.42	1,194.07
8' "	583,544	.753	4,394.54	3,936.69
Total Lagging	1,003,657	.763	7,654.96	5,130.76
3" Poles	401,682	1.28	5,149.42	3,590.13
Total Lagging & Poles 1927	1,405,339	.911	12,804.38	8,721.89
" " " 1926	951,367	.917	8,721.89	
1" Covering Boards	13,113	18.14	237.99	631.16
Product			326,814	290,162
Feet of Timber Per Ton of Ore			.66	.649
" " Lagging " " " "			3.07	3.28
" " " " Ft. " Timber			4.65	5.06
Cost Per Ton for Timber			.0457	.0429
" " " " Covering Boards			.0007	.0022
" " " " Lagging			.0234	.0177
" " " " Poles			.0158	.0124
" " " " All Timber			.0857	.0752
Equivalent of Stull Timber to Board Measure			364,741	305,676
Feet Board Measure Per Ton of Ore			1.12	1.053
Cost of Timber, Lagging, Poles Etc. - 1927			27,993.33	
" " " " " " - 1926			21,787.65	
" " " " " " - 1925			17,701.50	
" " " " " " - 1924			16,664.69	
" " " " " " - 1923			15,207.16	
" " " " " " - 1922			11,735.86	

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

8. COST OF OPERATING:7. UNDERGROUND:e. Drifting and Raising:

Although we did considerable development work during the year, very little of it was in rock. Most of our rock work was confined to the new second outlet raise from the sixth to the fourth level, all of which is in slate.

The following figures show the comparison with previous years.

Year	Total Footage	Ore Drifting	Ore Raising	Rock Drifting	Rock Raising
1924	3,107 Ft.	1,945 Ft.	803 Ft.		359 Ft.
1925	4,896 Ft.	2,794 Ft.	1,288 Ft.	390 Ft.	424 Ft.
1926	5,350 Ft.	2,249 Ft.	1,703 Ft.	868 Ft.	530 Ft.
1927	4,845 Ft.	2,210 Ft.	2,232 Ft.	9 Ft.	394 Ft.

f. Explosives, Drilling and Blasting:

We made several changes during the year in an effort to save money on explosives. At the beginning of the year, the mine was using $1\frac{1}{2}$ " x 8" - 40% Low Freezing Ammonia Dynamite and $1\frac{1}{2}$ " x 8" - 60% Gelatine. We changed to bulk powder, using first #2 and then #4. We found #2 did not have enough strength and then tried #4. The fumes from the latter were objectionable and we changed back again to 60% Gelatine.

Statement of Explosives Used For Breaking Ore:

Kind	Quantity	Average Price	Amount	
			1927	1926
40% Powder	32,600	13.00	4,244.50	9,951.60
60% "	127,500	15.50	19,611.25	11,488.27
No. 2 Extra	1,050	14.00	147.00	
No. 4 "	2,200	14.00	308.00	
Total Powder	163,350	14.87	24,310.75	21,439.87
Fuse	586,050	6.09	3,570.76	3,112.62
#6 Caps	103,607	10.66	1,104.12	947.54
Tamping Bags	35,800	2.12	75.75	128.14
Crimpers	31	.41	12.79	8.85
Total Fuse, Caps Etc.			4,763.42	4,197.15
" Explosives			29,074.17	25,637.02
Product			326,814	290,162
Pounds Powder Per Ton of Ore			.5	.514
Cost Per Ton for Powder			.0744	.0739
" " " " Fuse, Caps Etc.			.0146	.0145
" " " " All Explosives			.089	.0884
Average Price Per Lb. for Powder			.1487	.1438

9. EXPLORATION:

No diamond drilling was undertaken this past year and the only new work carried on in virgin territory was drifting 2400 feet down into the S.W. of the S.E. $\frac{1}{4}$ of Section 1-27-22, to find the extension of the main #33 deposit south of Chase Lode No. 2.

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

8. COST OF OPERATING:

	1927	1926	Increase	Decrease
Product	326,814	290,162	36,652	
Underground Costs	1.288	1.165	.123	
Surface Costs	.222	.205	.017	
General Mine Accounts	.132	.110	.021	
Cost of Production	1.642	1.480	.162	
Depreciation	.225	.251		.026
Taxes	.178	.182		.004
Central Office	.093	.087	.006	
Welfare, Safety, Hospital Etc.	.050	.042	.008	
Cost Adjustment	.018	.021		.003
Cost on Stockpile	2.206	2.063	.143	
Loading and Shipping	.063	.074		.011
Total Cost on Cars	2.269	2.137	.132	
Royalty	.114	.099	.015	
Rail Freight	.640	.640		
Lake "	.760	.760		
Cargo, Insurance and Analysis	.010	.010		
Shrinkage	.030	.029	.001	
Total Cost Lower Lake Ports	3.823	3.675	.148	
No. of Days Operating	267	259	8	
No. of Shifts and Hours	1-8	1-8		
Average Daily Product	1224	1120	104	
<u>Cost of Production</u>				
Labor	1.018	.949	.069	
Supplies	.624	.531	.093	
Total	1.642	1.480	.162	

Cost of Production For Past Eight Years:

Year	Production	Daily Product	Cost of Production		
			Labor	Supplies	Total
1920	261,772	873	1.751	.734	2.485
1921	209,034	723	1.482	.870	2.352
1922	221,979	737	1.019	.649	1.718
1923	260,335	862	1.083	.682	1.765
1924	246,356	940	1.026	.658	1.684
1925	265,829	1,022	.978	.595	1.573
1926	290,162	1,120	.949	.531	1.480
1927	326,814	1,224	1.018	.624	1.642

Cost of production for 1927 includes .084 per ton for shaft sinking.

9. EXPLORATION:

No diamond drilling was undertaken this past year and the only new work carried on in Virgin territory was drifting South-west across onto the S.W. of the S.E. $\frac{1}{4}$ of Section 1-47-28, to find the extension of the main #33 deposit South of Chase Lease No. 9.

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

10. TAXES:

The following tables show tax data for Ely and Ishpeming Townships and the valuations and taxes paid by our company in these two townships.

Lloyd Mine	1927		1926	
	Valuation	Amount	Valuation	Amount
Realty	396,450	14,886.24	380,450	13,451.21
Personal	421,000	15,807.74	465,450	16,464.63
Total Lloyd & Sec. 6	817,450	30,693.98	845,900	29,915.84
Morris Mine				
Realty	355,600	11,348.62	367,600	10,718.19
Personal	500,000	15,959.01	481,600	12,079.50
Total Morris	855,600	27,307.63	849,200	22,797.69
Grand Total	1,673,050	58,001.61	1,695,100	52,713.53
Product- Tons		326,814		290,162
Taxes Per Ton Produced		.1778		.1812
Shipments- Tons		297,288		224,775
Taxes Per Ton Shipped		.1953		.2322
Barnes Hecker Mine				
Realty	13,000	414.89	53,000	1,422.86
Personal	176,000	5,617.87	240,700	6,461.68
Total Barnes Hecker	189,000	6,032.76	293,700	7,884.54

Taxes Raised Ishpeming Township:

Tax	1927	1926	1925
State	4,141.88	3,221.41	3,504.98
County	6,315.58	6,760.15	5,429.85
County Road	2,914.20	3,281.91	3,293.77
Township Contingent	1,010.35	1,000.00	
Highway Improvement	6,996.79	6,600.00	3,000.00
Road Repair	4,497.38	5,000.00	3,000.00
School	18,486.98	16,750.00	15,690.00
One Mill	1,227.00	1,253.00	1,310.00
Rejected		1.11	233.61
Total Tax	45,590.16	43,867.58	35,462.21
Tax Paid By C.C.I.Co.	35,073.20	34,026.34	28,059.86
Percentage of Tax Paid by C.C.I.Co.	77.05	77.65	78.38
Assessed Valuation	1,227,000.00	1,253,000.00	1,310,000.00
Tax Rate	3.717	3.502	2.707

In the first place, we made a change in the underground personnel, a new mining captain and underground foreman being appointed, a new boss put in charge of the Lloyd shaft and an additional boss put in charge of the sixth level contracts in the Morris shaft. That means better and closer supervision.

During the summer months, I took our mining captain underground in various mines on the Menominee and Gogebic Ranges and we were very much impressed with the efforts of the Oglebay-Scott Co. and the Dickson Mather Company to eliminate accidents.

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

10. TAXES:
(Continued)

Taxes Raised Ely Township:

Tax	1927	1926	1925
State	6,132.88	4,512.02	4,293.00
County	9,359.17	9,468.52	6,566.98
County Road	4,314.26	4,596.76	3,983.55
Highway Improvement	5,000.93	4,000.00	3,500.00
Road Repair	5,999.91	4,500.00	4,000.00
School	12,999.95	13,000.00	12,000.00
One Mill	1,816.60	1,755.00	1,584.37
Bridge	2,999.06	2,000.00	1,500.00
Rejected	1,033.61	41.57	96.43
School Building	4,251.18		
Township Contingent	3,500.35	2,500.00	2,000.00
Total Tax	57,407.90	46,372.87	39,470.33
Tax Paid By C.C.I.Co.	34,222.89	31,546.14	28,656.11
Percentage of Tax Paid By C.C.I.Co.	59.80	68.15	71.05
Assessed Valuation	1,816,600.00	1,755,000.00	1,584,000.00
Tax Rate	3.160	2.657	2.52

11. ACCIDENTS AND
PERSONAL INJURIES:

We are pleased to report that the number of accidents occurring during the year were cut from (39) thirty-nine to (25) twenty-five, notwithstanding the number of man shifts worked increased from 55,161 to 65,097.

We regret to report one fatal accident on April 13th, when John Niemie was killed while helping to land shaft timber on the 7th level plat.

The accidents occurring at the Morris-Lloyd property were classified as follows:

Falls of ground	5
Haulage	3
Hand Tools & Machinery	3
Chunks rolling down piles	2
Timber	4
Miscellaneous	8
Total	25

The reduction in the accident rate is, I believe, due to two reasons. In the first place, we made a change in the underground personnel, a new mining captain and underground foreman being appointed, a new boss put in charge of the Lloyd East end and an additional boss put in charge of the sixth level contracts in the Morris shaft. That means better and closer supervision.

During the summer months, I took our mining captain underground in various mines on the Menominee and Gogebic Ranges and we were very much impressed with the efforts of the Oglebay-Norton Co. and the Pickands Mather Company to eliminate accidents.

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

11. ACCIDENTS AND
PERSONAL INJURIES:
(CONTINUED)

Tugger Hoists and Scrapers:
We were much impressed with the neatness and cleanliness of these mines, due to excellent illumination underground.

Upon our return, we started a clean-up campaign, placed additional lights in service, equipped men with gloves and goggles, enforced stricter discipline, converted the bosses into safety enthusiasts and in a short time, the accidents began to diminish.

The keynote for the whole safety campaign is discipline and once the men realize that, you will get better results.

12. NEW CONSTRUCTION
AND
PROPOSED NEW CONSTRUCTION:

E. & A. #493:

This E. & A. covered cost of installing crusher in the Morris shaft house, new motor for skip hoist, raising dump in the head frame etc. This work started in 1926 was finished the first week in January 1927 and has been operated without a hitch. We handled 31,901 tons of furnace ore through the new plant the past year.

The construction work was finished without overrunning the estimate, in fact, we finished with a credit balance of \$1,045.61.

After the skip hoist was rebuilt, we put a herringbone gear and new pinion on the cage hoist. The gear came from the Salisbury Mine.

We are now planning on changing both gears at the Lloyd shaft. These hoists are still operating with the old spur gears and are driven from the motor by double reduction.

Underground we expect to install new pumping equipment on the eighth level. This level will be started in 1928 and pump-house and sump should be finished in the latter part of the new year. It is proposed to install two pumps, one from the Spies Mine and one from the Salisbury. Most of the piping and fittings can be secured from the Stephenson Mine, so that no new purchases will be required for the pumping equipment.

13. EQUIPMENT AND
PROPOSED EQUIPMENT:

b. Stockpile Trestle:

We graded and levelled off for seven new bents at the East end of the North stocking area North-east of the Morris shaft. Additional room can easily be secured by moving 2500 yards of sand along the North side of the pile, which would make available room to stock 150,000 tons.

14. MAINTENANCE
AND REPAIRS:

d. Tugger Hoists and Scrapers:

The Morris-Lloyd Mine is now 100% scrapers. We added three Sullivan Electric Hoists; two Ingersoll-Rand Hoists and seven new Waugh Electrics giving each contract a scraper. At the close of the year, we had the following equipment in service.

Sullivan	11 Air Hoists	8 Electric Hoists	Total	19
Ingersoll	5 " " "	0 " " "	"	5
Waugh	4 " " "	7 " " "	"	11
Grand Total	20 " " "	15 " " "	"	35

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

13. EQUIPMENT AND
PROPOSED EQUIPMENT:

d. Tugger Hoists and Scrapers:

(Continued)

(Continued)

We conducted experiments all year on ropes, scrapers, guards etc. We have standardized on rope guards and have also covered all drums with guard plates, partly to keep dirt from flying off into a mans eye and also to prevent their clothing getting cuaght in the ropes. We have adopted the Seale construction independent wire rope centre as standard 1/2" size for pulling and 3/8" for the tail rope. After trying box scrapers, hoe scrapers, crescent and other shapes, we finally concluded that the best all round scraper for our use was an improved Hoe Type with straight ball, 56" long, 21" high and 42" wide, the back being a reversible 1/2" Manganese plate and the sides of 1/2" Manganese plate. No weights are required with this scraper.

We have also come to the conclusion that more powerful and faster scraper units will be used underground. In the Section Six mine, we employed a 15 H.P. Sullivan Electric Hoist to transfer ore. This unit has a pulling speed of 200 feet per minute.

We also equipped all the air driven scraper hoists with "Line Oilers" to insure proper lubrication. The oilers can be set for heavy or light oil and we adjusted them to feed one pint per hour.

e. Idlers:

Experiments during the year were centered on our hoisting ropes and idlers. It is a notorious fact, that the life of the hoisting ropes at the Morris-Lloyd is low and the mechanical department thought that the trouble was due to friction between the rope and idlers in the pulley stands. First pipe rollers were tried, these being later covered with rubber but the idlers wore out very fast. Then rubber covered idlers were purchased from the Robbins Conveyor Co. These were in service at the end of the year but from inspection, I don't believe they will hold up either.

There is a probability that the excessive fleet angle is at the bottom of all the trouble and for that reason, we are now oiling the drums daily. We are also getting advice from the various rope manufacturing companies as to proper type of rope for our conditions. Personally, I believe a more flexible rope will improve the service our ropes give.

14. MAINTENANCE
AND REPAIRS:

a. Shafts:

We rebuilt the Lloyd shaft sets from the third level down. The wall and end plates and dividers were badly worn from the dirt dropping down the shaft below the third level pocket. New sets were placed on top the old ones and both the end plates, wall plates and dividers in the two skip compartments were covered over with scrap plate to stop excessive wear. New runners were then installed and the Lloyd shaft below the third level is now as good as new.

The third level storage pocket was also rebuilt and the pocket on the fourth level should also be entirely renewed.

We make a careful inspection of each shaft each week and new runners are put in as needed. The shafts are guaged yearly, something not heretofore done.

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

14. MAINTENANCE
AND REPAIRS:
(Continued)

b. Electric Tram Equipment:

We have the most extensive underground haulage system in any of the company's mines. We keep seven locomotives busy on seven miles of main line tracks. We have (96) ninety-six motor cars in service. A great deal of our mine line haulage is laid with (30#) thirty pound rail and during the year, we replaced extensive sections of this light rail with (40#) forty pound. On the seventh level, the entire track was rebuilt and raised. New ties were used and spaced closer and the new type Ohio Brass Co.'s A.W.12 rail bonds used.

A spare locomotive was purchased from the Austin Mine and the draw-head so arranged to permit its being removed easily, so that the motor could be run onto a standard cage and moved rapidly from one level to another.

We discarded all of the old Lake Mine four ton saddle back cars and replaced them with the modern type.

All of the tram cars are now equipped with "Agathon" steel axles and Chrome Nickel wheels.

We also changed the design of the brake rigging on all our motors in an effort to cut down the excessive use of new brake shoes. The benefits of this change will not be noticeable until next year.

c. Hoisting Equipment:

Under this heading, we include the skips and cages. We rebuilt all three cages in use and put them in first class shape. We also put into service two new skips. All of our skips now have a collar added onto the top to prevent spillage.

d. Top Tram Equipment:

A new (50) fifty H. P. Motor was put into service on the Morris shaft top tram. The old motors were (40) forty H. P. and a little too light for the work they are called upon to do. We stock considerable ore up-grade.

e. Motor Haulage Set:

Considerable trouble has been experienced for years with the underground haulage set. Every two or three years, a set gives out due to trouble with the rotor. Two 100 K.W. sets have burned out in the last two years. In order to prevent delays, we moved the large unit from the Central Power Plant at Princeton and installed it at North Lake. This unit is 50% larger than our old one and to further safeguard ourselves against trouble, the switch board was wired so that both the regular unit and the span can be run at the same time when the Peak load comes on.

f. Miscellaneous Equipment:

All raises were equipped with gates at the foot of the ladder roads to prevent men climbing down from stepping back onto the motor tracks. The gates force them to turn and face the tracks before stepping out from the ladder road.

All contracts were furnished with special boxes for powder and a wooden mallet for opening powder boxes.

MORRIS LLOYD MINE
ANNUAL REPORT
YEAR 1927

14. MAINTENANCE AND REPAIRS:

f. Miscellaneous Equipment:
(Continued)

All contractors were given come-a-longs for skidding timber.
All raising contracts were furnished safety belts, gloves and goggles.
All men handling timber were required to wear gloves.
All contracts were given special sollar planks to cover dirt compartments with when scraping was not in progress.
All chutes were equipped with special hinged planks to cover trolley wire when dirt was being loaded out of chute.

16. WATER SUPPLY:

We had considerable trouble with broken water mains during the year and a great deal of the old pipe was replaced with (4") four inch iron pipe.
We also placed five shut-off valves in the system in the location so that leaks could be repaired without shutting off all the water as heretofore.

17. MINE LOCATION:

Extensive repairs to the houses were continued. The work done the last three years, however, has so improved the general condition of the houses, that very few extra repairs will be necessary for 1928.
All the houses are now covered with Asbestos Shingles. All sheds have been repaired. Most of the windows and doors are in good shape. The porches need attention next year.
In the past year, we repaired all the fences on the West side of Main Street. The roads were all graded and gravelled. Two short roads should be built next summer connecting the South ends of First and Second Streets, so that the County plows can run around to plow the South-east corner of the location.
We have no empty houses for rent, in fact, there are three applications on hand for houses just as soon as some tenant vacates.

18. NATIONALITY REPORT:

Following is the nationality report for the Morris-Lloyd Mine for the quarter ending December 31st, 1927:

Finnish	95
French	58
English	30
Italian	30
Swedish	18
Norwegian	4
Austrian	1
Irish	1
Greek	1
Hollander	<u>1</u>
Total	239

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

19. GENERAL
UNDERGROUND
OPERATIONS:

(Continued)

The following is a general description of the mining operations in the various portions of the mine during the year:-

Lloyd Mine East:

Twelve contracts are regularly employed here - Nos. 1, 2, 3, 8, 9, 10, 17, 19, 40, 46, 100 and 102.

Main Deposit:

East End:

The territory in the extreme East end of the mine is mined out to the second sub below the second main transfer level. Nos. 10 and 19 have taken all the ore in the crotch between the main dike and the foot back to a line near raises Nos. 51, 52 and 53.

In the central portion of the main deposit, between #43 and #53 raises close to the second main sub, we tried to sub out the ore with regular (10') ten foot slices. Nos. 8 and 100 mined out two subs and we found the ore too narrow to permit making a profit. We, therefore, decided to stope this ore from the third main sub up. No. 8, therefore, cut out #43 raise at the 1165 foot elevation and drifted both East and West along the main dike to open up the main tramming drift. They drove West to the old cave coming up from the main third level stope and East to #53 raise. From these drifts, raises were put up close together and a shrinkage stope started. At the end of the year, the back of the stope was fifty feet above the floor of the third main sub. We found the ore next to the main dike very slabby and we are leaving four or five feet to prevent the dike mixing with the ore. As the ore is drawn off, this shell of ore will mix with the broken ore in the stope.

No. 10 Deposit:

This ore chimney, which extended from the fourth level to surface, is being mined at two different elevations. The hanging is very flat between the second and third levels and #40 is mining above the third transfer level, while #2 and #46 are taking the ore close to the third main level. The top gang cleaned out two subs, the 1245 and 1235 foot levels. At the 1245 foot elevation, a drift was driven through the footwall Jasper to Diamond Drill Hole #62 which showed considerable ore. No ore was cut on the 1245 foot elevation but we did find the ore on the 1235 foot sub.

At the lower elevation, ore was sliced from four subs. At the 1010 foot elevation, we found the ore going South at #2 raise and we drifted sixty feet to the South-west before the hanging was reached. On the bottom or 1005 foot sub, all the mining was confined to the North-east end of the deposit.

No. 12 Deposit:

This deposit lies along the main footwall dike in the South-west end of Section Six Mine, beginning at a point ninety feet above the 1290 foot sub directly South of the shaft and then pitching very flat to the West to the 1165 foot elevation. It varies in width and length, being very irregular. At the 1270 foot elevation, we find an ore area 250 x 70 feet. During the past year Nos. 1 and 17 mined out this deposit from the 1290 to the 1270 foot elevation and started to sub ten feet below the latter elevation.

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

9. GENERAL
UNDERGROUND
OPERATIONS:
(Continued)

No. 12 Deposit:
(Continued)

In order to avoid shoveling below the 1245 foot sub, contract #100 drifted South-west from #12 raise for 100 feet. A raise was then planned to come up from the East end of their drift to the West end of the deposit on the 1245 foot sub. Contract #1 will then be able to scrape into this transfer raise and take the balance of the ore direct into #12 raise to the bottom of the deposit below the third main sub.

Third Main Sub:

In the North-west limb of the main deposit, contract #20 started raising from the back of main foot wall drift between the shaft and #51 raise on the third main sub. We plan a sub stope to take out the narrow ore lens that runs back 160 feet West of #51 raise. The ore only goes up a short distance above the 1165 foot elevation.

Main Third Level:

A new raise was started from the third level 220 feet South-east of the shaft extending to the 1030 foot sub level. At that elevation #3 mined back to the limit of mining East of the 3600 foot coordinate line taking out all the ore West to old cave. On the South side of the same sub between the main dike and a smaller dike to the North, #20 subbed East and West 110 feet from their raise. These two gangs dropped down two subs during the year finding the ore pinching out rapidly as we near the third level.

Lloyd Mine:

There is nothing new to report from the Lloyd Mine proper. We reduced the number of gangs to five.

1015' Sub Level:

A few small pillars in the North-west end of the deposit were mined by #15 and #44.

1005' Sub Level:

Nos. 15 and 44 took out an area 120' x 80' above the second crosscut. the crotch in the North-west corner is moving East very fast, shortening up the length of the ore along the foot, fifty feet on each sub level.

995' Sub Level:

Most of the ore mined at this elevation was taken out in 1927. Nos. 5, 7 and 16 cleaned up an ore area approximately 300 feet long and 100 feet wide. This ore is on the East side of the deposit.

No. 61 Deposit:

The two lenses in #61 deposit above the sixth level were raised down to the mill floor. The North lens went up 60 feet above the level and the other only extended 30 feet above the mill floor.

MORRIS-LLOYD MINE
ANNUAL REPORT
YEAR 1927

19. GENERAL
UNDERGROUND
OPERATIONS:
(Continued)

985' Sub Level:

Contracts Nos. 5, 11 and 16 all dropped down their respective raises from the 995 foot elevation and started subbing ten feet below. By the end of the year, Nos. 5 and 11 had taken a fair sized section of ore out between the two main dikes in the South portion of the deposit. No. 16 had just started drifting East and West along the Jasper foot from their raise leaving the pillars to be taken in 1928.

Morris Mine:

Sixth Level:

East Deposit:

Contract #32 started mining 100 feet above the 6th level and took out five subs during the year. The top 300 feet of this ore extending to the fourth level was left in place to protect two concrete plugs in the raises below the fourth level, running up through the East Deposit. This ore lens is narrow being only two slices wide and 120 feet long.

No. 21 Deposit:

West Side:

As in the case of the East Deposit, mining was started 300 feet below the fourth level leaving a pillar of ore 300 feet high to protect the concrete plug in the raise at the fourth level. The top sub called the 430 showed an ore area 50' x 80'. Contract #33 mined out this sub, the 420' sub and started the 410'. At this latter elevation, the ore was found to run West 95 feet from the raise so we decided to have #34 put up a new raise from the sixth level to make room for another gang in this deposit. This raise was holed to the 410 foot elevation and slicing started just as the year drew to a close.

East Side:

Two hundred feet East of #33 and #34, contract #35 explored a stringer of ore going up from the sixth level. A raise was put up for 100 feet, 75 feet East of the 1200' Meridian. The first sub mined out was opened up 60 feet above the sill floor. The ore here was about 50 feet in diameter. We expect this ore to pitch to the West and join the ore mined by #33 and #34 somewhere above the sixth level.

Main or No. 33 Deposit:

The two stringers of the main deposit reaching above the sixth level were mined down to the sill floor by Nos. 35 and 63.

West Deposit:

Contract #37 took pillars left in this deposit on the 360, 370 and 380 foot levels.

No. 61 Deposit:

The two lenses in #61 deposit above the sixth level were mined down to the sill floor. The North lens went up 60 feet above the level but the other only extended 30 feet above the sill floor.