

REPORT ON DRILLING OF LEFROY REEFS

With the object of testing the value and proving the downward extension of certain of the known quartz reefs below the old workings at Lefroy, a drilling campaign with the "Sullivan" diamond drill was commenced on 31st January 1935 and completed on 29th June, 1937.

Fourteen bores were put down through black slates, sandstones and quartzites to an average depth of 693 feet, while the total frontage amounted to 9,704 feet.

Bore holes 1, 2 and 3 were sited to cut Chum Reef; 4, 4a, 5, 6 and 7 Morning Star Reef; 8, 11, 12 and 13 Golden Era Reef, and 9 and 10 to intersect Volunteer Reef.

NO. 1 BOREHOLE - CHUM REEF

This hole was located 377 feet from New Chum Shaft, bearing $196^{\circ}30'$. It was directed towards Chum Reef on a bearing of 350° and depressed at an angle of 73° with the object of intersecting the reef at 800 feet.

Quartz veinlets were encountered between 521 and 531 feet, 545 and 571 feet, 658 and 664 feet, 664 and 668 feet, 668 and 673 feet, 673 and 778 feet, 798 and 806 feet (6 inches quartz at 800 feet), 825 and 840 feet.

The hole continued to 1167 feet (1116 feet vertically from surface) without cutting any more quartz.

The cutting and core sections obtained from the under-mentioned depths were assayed with the following results:-

<u>Depth</u>		<u>Gold</u>	<u>Silver</u>
<u>From</u>	<u>To</u>	<u>per ton</u>	<u>per ton</u>
303'	- 305'	Nil	Nil
501'	- 501'3"	"	"
510'		"	"
525'	- 525'10"	"	"
566'6"	- 567'	"	"
825'	- 831'	6 grns	6 grns
831'	- 833'	1 dwt 1 grn	6 "
833'	- 840'	Nil	Trace

NO. 2 BORE-HOLE - CHUM REEF

No. 2 Borehole was put down at 282 feet bearing 252° from No. 1 Borehole and was depressed at an angle of 80° along a bearing of 340° . It was expected that reefs would be intersected at 620 feet and 750 feet.

Between 459 to 499 feet, and 598 to 698 feet quantities of fine pyrite were passed through.

Small quartz veins occurred between 588 to 596 feet, 609 to 618 feet, 664 to 664 feet 8 inches, 765 to 773 feet, 838 to 839 feet, 1,023 to 1,023 feet 6 inches, 1,036 to 1,046 feet,

1090 to 1,145 feet, and 1,230 to 1255 feet.

The hole was completed at 1,260 feet, being 1,241 feet vertical from surface.

Assays of samples from different sections were undertaken with the following results:-

<u>Depth</u>		<u>Gold</u>	<u>Silver</u>	<u>Remarks</u>
<u>from</u>	<u>to</u>	<u>per ton</u>	<u>per ton</u>	
459'	- 461'	Trace	3 dwt 13 grs	Pyrite concentrate from cuttings.
461'	- 499'	Nil	Nil	do.
598'	- 608'	Nil	Nil	do.
588'	- 596'	Trace	13 grs.	Split cores
596'	- 664'	Nil	Nil	do.
837'	- 838'6"	Nil	Nil	Core and cuttings
1008'		Nil	Nil	do.
1091'	- 1096'6"	Trace	Trace	do.

NO. 3 BOREHOLE - CHUM REEF

This is situated at 267 feet, bearing 255°10', from No.2 borehole and was bored to cut reefs at about 640 and 775 feet respectively. The drill was set at an angle of 80° and bearing 337°.

White quartz and quartz formation were pierced from 461 to 462 feet 2 inches, sandstone and slate with quartz veins from 625 to 630 feet, chiefly quartz from 714 to 716 feet, sandstone and slate with quartz veins from 716 to 732 feet, quartz and slate from 897 to 900 feet, black slate with quartz veins from 1,123 to 1,134 feet.

The bore reached a depth of 1,300 feet (1280 feet vertical).

The result of an assay of core between 897 and 900 feet showed traces of both gold and silver.

Cuttings from the same section gave nil results for gold and silver.

NO. 4 BOREHOLE - MORNING STAR REEF

This borehole was started from a point 156 feet - bearing 219°48' - from Morning Star main shaft. The drill was directed north and depressed at 85°.

Estimated depth to reef was considered to be 500 feet.

Slate with quartz veins came in between 307 and 311 feet, 327 and 348 feet, and quartz rubble with pyrite showed in the cuttings between 487 and 512 feet.

The hole was abandoned after reaching 512 feet (510 feet vertical) owing to the ground caving.

Assay results of core and cuttings are as follows:-

From	Depth		Gold		Silver		Remarks
	To		Per	Ton	Per	Ton	
338'	-	347'		Trace		Trace	Core
338'	-	342'		"		"	Cuttings
342'	-	347'		6 grns		6 grns	"
506'	-	512'		Nil		Nil	"
506'	-	512'		Trace		Trace	Pyritic concentrate

NO. 4A BOREHOLE - MORNING STAR REEF

No. 4A borehole was placed 10 feet east of No. 4 borehole with the object of testing the ground in the same vicinity between 500 and 600 ft. in depth. The drill was depressed and directed similarly to No. 4 borehole.

At 215 feet a vein of quartz was passed through. A highly mineralised quartz formation occurred between 316 and 322 feet slate and sandstone with quartz veins between 329 and 370 feet; slate and quartz formation from 370 to 371 feet 3 inches; an apparent lode formation producing sand and coarse quartz cuttings from 552 to 562 feet, and quartz formation with slate and sandstone from 562 to 587 feet.

The hole was completed at 614 feet (612 feet vertical).

Assays of cores and cutting gave the following results:-

From	Depth		Gold		Silver	
	To		Per	Ton	Per	Ton
562'	-	565'		9 grs		3 grs
565'	-	570'		Trace		Trace
570'	-	574'		13 grns		6 grs
574'	-	577'		9 grs		3 grs
577'	-	587'		13 grs		6 grs
582'	-	587'		13 grs		6 grs
590'	-	597'		19 grs		6 grs

NO. 5 BOREHOLE - MORNING STAR REEF

Situated 132 feet on a bearing of $245^{\circ}23'$ from No. 4 borehole. Drill directed north at angle of 85° . Penetration of reefs was expected at 465 and 600 feet.

A three inch quartz vein was cut at 184 feet; slate and sandstone with small quartz veins between 190 and 274 feet; 455 and 473 feet; 517 and 518 feet; 524 and 585 feet, and six inches of quartz from 585 to 585 feet 6 inches.

Total depth of hole 624 feet (622 feet vertical).

Apparently no assays were made of the cuttings and cores from No.5 bore hole.

No. 6 BOREHOLE - MORNING STAR REEF

This hole is located 106 feet north from No.4 borehole.

The drill was directed south at an angle of 85°.

Between 70 and 83 feet coarse quartz gravel was disclosed by the drill cuttings.

At 286 feet (285 feet vertical) drilling was discontinued in slate and sandstone when investigation disclosed that the hole had been started too close to the reef outcrop.

The cuttings from between 70 and 83 feet were assayed with the following results:-

	<u>Gold</u>	<u>Silver</u>
Coarse clean quartz	6 grs	6 grs
Fine dark material	1 dwt 14grs.	2 dwt 2 grs.

NO. 7 BORE HOLE - MORNING STAR REEF

Position of bore hole 50 feet north from No.6 bore hole. Angle and direction similar to the latter. Total depth 633 feet (631 feet vertically from surface.)

Quartz gravel appeared in the cuttings from 101 to 110 feet. Quartz occurred between 613 and 615 feet 6 inches, and mixed slate and quartz from 619 to 623 feet.

The result of assays of cores and cuttings from 613 to 623 ft. showed gold and silver "nil".

NO. 8 BOREHOLE - GOLDEN ERA REEF

No. 8 bore hole is situated 141 feet due north-east from Amalgamated Golden Era main shaft. The drill was directed on a bearing of 330° and depressed at an angle of 82°. The drill was sited to cut the reef at about 300 feet. The total footage of the hole was 398 feet (394 feet vertical).

From 146 to 148 feet 6 inches coarse quartz rubble was obtained from the cuttings; 3 inch quartz veins appeared at 171 and 192 feet respectively, and quartz rubble in the form of cuttings occurred between 270 and 273 feet 6 inches, and from 295 to 296 feet.

Assay results of the various samples were as follows:-

<u>Depth</u>		<u>Gold</u>	<u>Silver</u>	<u>Remarks</u>
<u>From</u>	<u>To</u>	<u>per ton</u>	<u>per ton</u>	
146'	- 148'6"	Nil	Nil	Cuttings
171'	- 173'3"	Nil	Nil	Core
192'	- 192'3"	Nil	Nil	Core
194'	- 194'1½"	Nil	Nil	Core
272'	- 273'	12 grs.	12 grs.	Cuttings
273'	- 275'	Nil	Trace	Cuttings
273'	- 274'	Nil	Trace	Core
286'	- 287'	Nil	1dwt. 7grs.	Cuttings

NO. 9 BOREHOLE - VOLUNTEER REEF

Located 283 feet due south-west from West Volunteer new shaft. Direction of drill - north, and depressed at 85°. Sited to intersect the reef at approximately 850 feet. Total depth 860 feet (857 feet vertically from surface). Lode material was passed through at the points indicated below:-

- (1) 40 to 47 feet - slate and quartz rubble
- (2) 290 to 291 feet - quartz formation. Core 6 inches
- (3) 550 to 550 feet 3 inches - quartz. Core 3 inches
- (4), 565 to 565 feet 3 inches - quartz. Core 3 inches
- (5) 600 to 607 feet - slate and schist with small quartz veins, Core 3 feet 6 inches.
- (6) 607 to 608 feet - slate & 2 inch quartz vein. Core 12 in.
- (7) 608 to 609 feet - slate with 6 inch quartz vein. Core 10 inches.
- (8) 680 to 700 feet - quartzite and slate with small quartz veins.
- (9) 763 to 764 feet - quartz. Core 10 inches
- (10) 772 to 772 feet 3 inches - quartz. Core 3 inches
- (11) 790 to 796 feet 6 inches - quartz and slate. Core 3ft. 3in.
- (12) 801 to 802 feet - quartz. Core 10 inches
- (13) 804 to 813 feet - lode formation. Core 3 ft. 6 inches

The following samples were assayed with "nil" results for gold and silver.

- (a) Slate formation at 187 feet
- (b) Cuttings from 763 to 764 feet
- (c) Core from 608 to 609 feet, 761 to 764 feet, 790 to 799 feet and 801 to 802 feet.

NO. 10 BORE HOLE - VOLUNTEER REEF

Bore situated 200 feet from No. 9 bore hole on a bearing of $283^{\circ}13'$. Drill directed at 347° and depressed at angle of 85° .

Estimated depth of reef 750 feet.

The hole was completed at 777 feet (774 feet vertical)

Details of veins intersected are:-

- (1) 300 to 316 feet. One to two inch veins of quartz in slates and sandstone.
Core - 8 feet.
- (2) 488 to 488 ft. 8 inches. Quartz.
Core - 7 inches
- (3) 573 to 623 ft. Slate and schist with quartz veins.
Core 40 feet.
- (4) 623 to 623 ft. 7 in. Quartz. Core 7 inches
- (5) 660 to 660 ft. 3 inches Quartz. Core 3 inches
- (6) 671 to 673 ft. 6 inches Quartz with some slate.
Core 2 feet 2 inches.
- (7) 677 to 677 ft. 8 inches. White quartz. Core 5 inches

Assay results of cores and cuttings from 436 to 439 feet and from 447 to 448 feet gave "nil" returns for gold and silver in each case.

NO. 11 BOREHOLE - GOLDEN ERA REEF

This bore hole was located 250 feet on a bearing of 240° from No. 8 bore hole. It was directed on a bearing of 330° and depressed at 82° .

Estimated depth of reef 300 feet.

Total depth of hole 414 feet (410 feet vertical).

At 268 feet a quartz vein 12 inches in thickness was passed through, giving a core of 9 inches. The cuttings and core were assayed separately and both gave "nil" results for gold and silver. Concentrates of pyrite obtained from between 332 and 335 feet showed gold 7 dwt. 8 grs., and silver 6 dwt. 19 grs. by assay.

NO. 12 BORE HOLE - GOLDEN ERA REEF

This is situated 112 feet from No. 8 Bore Hole - bearing 60°.

Direction drilled 330° and angle of depression 82°.

Estimated depth of reef 300 feet.

Total depth of bore 400 feet. (396 feet vertically from surface).

A little quartz was obtained in the cuttings between 60 and 80 feet, and 90 and 112 feet.

Assays of sandstone cuttings from 150 to 154 feet showed "nil" results for gold and silver.

NO. 13 BORE HOLE - GOLDEN ERA REEF

This hole was started at 100 feet on a bearing of 257° from No. 11 Bore Hole. The drill was depressed at an angle of 82° and directed towards the reef at a bearing of 343°. It was assumed that the reef would be cut at a depth of 300 feet.

The hole was completed at a depth of 459 feet. (455 feet vertically from surface.)

At 345 feet a lode formation two feet in thickness was intersected from which two inches of quartz core was obtained. This, together with the cuttings, was assayed but showed traces only of gold and silver.

Concentrates of pyrite from between 239^{and 240}/feet gave 1 dwt. 1 grn. of gold, and 1 dwt. 1 grn. of silver per ton by assay.

CONCLUSIONS:

The boring campaign has clearly illustrated that, although the lode formations extend to varying depths below the former underground workings, the gold values at the points penetrated are negligible.

This supports the contention of the Geological Survey staff that the upper portions of the reefs have been enriched by secondary processes and that the lower workings have penetrated an unproductive primary zone.

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24th December, 1937.

DEPTH	No. 8B Bore	No. 9B Bore	No. 10 Bore	No. 11B Bore	12B	13B
0' - 7'4"	1.37	.04	.06	.03	-	-
7'4" - 14'8"	.10	.06	.07	.05	-	-
14'8" - 22'	.13	.03	.23	.10	-	-
22' - 29'4"	.18	.02	.32	.04	-	-
29'4" - 36'8"	.14	.12	.23	.04	-	-
36'8" - 44'	.14	.07	2.89	.09	-	-
44' - 51'4"	.22	.48	2.86	.09	-	-
51'4" - 58'8"	.31	.06	.53	.11	-	6.62 (51'4" - 62'10")
58'8" - 66'	.11	.36	.65	.67	-	.88 (62'10"- 74'4")
66' - 73'4"	.09	.16	2.13	1.07	8.67	.86 (74'4" - 85'10")
73'4" - 80'8"	.13	.06	.51	.23	1.97	1.42 (85'10"- 97'4")
80'8" - 88'	.16	.59	.13	1.44	.89	1.28 (97'4" - 108'10")
88' - 95'4"	10.13 (88' - 94')		1.02 (88'-91'6")	.84	.83 (88'-99'6")	2.3 (108'10"- 118' 4")
95'4" - 102'8"				.31	1.69 (99'6"-110')	
102'8" - 110'				2.3 (102'8"-107'6")	8.44 (110'-122'6")	
					367.74	
<u>TOTAL DEPTH</u>	94'	88'	91'6"	107'6"	133'10"	118'4"
<u>AVERAGE VALUE</u>	.87	.17	.86	.45	32.53	1.27