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MINOPS PTY LTD

SUMMARY REPORT

THE QUEENSBERRY MARQUIS AREA

(Queensberry Mine)

OPEN FILE

M. J. Lennex

May, 1970

ENCLOSURES

1" = 200' Geological Plan Queensberry Mine

1" = 50' Surface Plan

1" = 20' Sections DDH Nos. 1 & 5, 2, 3, 6, 8

1" = 100' Soil Geochemistry - Lead

1" = 100' Soil Geochemistry - Zinc

1" = 50' Vertical Section Through All Lodes

INTRODUCTIONGENERAL

This report covers the work done in the first five months of 1970 in S.P.L.62 and the two enclosed 40 acre mineral leases 11M/66 and 12M/66, which are at present held under option by Apollo International Minerals N.L.

S.P.L.62 is situated some 6 miles south of Zeehan, just south of the Professor Range. It covers some 25 square miles from the Zeehan Strahan Rail formation to the Henty River. The greater part of the S.P.L. is covered by dense rain forest, excepting the northern part, which is a Button Grass plain. Access to the Queensberry Mine, in the centre of the S.P.L. is by a 7 mile Jeep track, leaving the Zeehan Strahan Railway at Grieve Siding.

PREVIOUS WORK

The information most contemporary with actual production of the mine is by A. M. Reid, Director of Mines, titled "Preliminary Report on Queensberry Mine Western District" dated 30th June, 1927. In this report he describes in some detail the history and production of the mine, which therefore will not be discussed in any detail in the present report. The only other contemporary information is a report in the issue of the Zeehan and Dundas Herald for 5th October, 1897, which describes the discovery of copper shows in the vicinity of McKimmies Big Show, referring to the Queensberry Mine. These shows occur within S.P.L.62.

D. L. Forsythe, a geologist for New Consolidated Goldfields (A/Asia) Pty. Ltd. submitted two reports Nos. 11/1968 and 12/1968 on minerals leases 11M/66 and 12M/66 and S.P.L.25 respectively. In these he reports on geological mapping, stream and soil geochemistry carried out in their 1967-68 field season. He located some anomalies within the Queensberry Mine area. His

reconnaissance geological mapping, which extended over most of S.P.L.25 (the central portion of S.P.L.62) indicates that the rocks in the area, namely Black Slates, Crystal Tuffs and Micaceous Sandstones, were probably Cambrian in age and containing parts of the Dundas Group.

WORK CARRIED OUT WITHIN THE AREAQUEENSBERRY MINE

A camp was set up on the tailings dump by Lode Creek (see 1" = 200' Geological plan). Initially a D.6 bulldozer was employed in some 10,000 feet of trenching and side cutting over the known lodes and areas of geological interest. Detailed mapping and soil sampling was undertaken over the trenches. The results of this gave positions for four vertical diamond drill holes planned to intersect the No.1 and No.4 Lodes 250 feet below their lowest exposed level.

Diamond drilling, to date, consists of 2,100 feet of hole in three vertical and five angle holes. (For a description of Diamond Drill holes and Intersections with Assays see Appendix).

Geological plans on the scales 1" = 100' and 1" = 50' were prepared over the whole site, 1" = 20' maps were made of selected trenches. Contract surveyors were engaged to establish a base line, positions and Reduced Levels of all Drill Holes and a permanent Datum.

Improvements to the Zeehan-Strahan tramway and the access road to the site were undertaken throughout the season.

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RESULTS

QUEENSBERRY MINE AREA

(All bearings and directions quoted are based on magnetic North).

GEOLOGY

The Wall rocks for the Queensberry mineralisation are slightly altered chloritic pyroclastics which on surface appear massive and weather to an orange clay. Drill core has revealed two distinct types, a coarse crystal tuff and graded tuffs often with thin slate intercalations. Neither of these are readily separated on surface due to weathering. The bedding on surface appears to be steeply dipping north with a strike in the region 80° - 180°. Lack of well defined bedding on the surface does not, however, lead to good structural interpretation.

All the lodes are terminated in the south by a shear fault which brings the pyroclastics into contact with soft black well cleaved slates, which in the mine area show no evidence of bedding. Forsythe, however, reports thin sandstone horizons elsewhere.

The only other rock type observed was a purplish coloured series of slates, thin quartzites and interbedded pyroclastics, which appear to strike N.W. In the mine region it had no great development and appears to be a different facies within the pyroclastics.

STRUCTURE

Folding

No positive evidence of folding was observed in the small area considered, but a strong cleavage is developed both in the pyroclastics and the Black Slates, which strikes

270° - 300° dipping steeply between 70° and 90°. No small scale minor folding was observed, which, combined with the steep cleavage probably indicates fairly large scale, upright, open folds as the predominant structural feature.

SHEARS AND FAULTS

The major fracture feature of the Queensberry site is the fault zone, striking at approximately 050°. This fault throws the pyroclastics against the Black Shales and forms the southern limit of all the ore bodies.

As the faults are mineralised, it would seem that the faulting is Pre-mineralisation, and this probably is due to the Tabberabberan Orogeny, the mineralisation being due to the associated granite intrusions.

The displacement of the lodes observed is due to prior displacement of the shear zones. This, however, does not discount the probability of post-mineralisation movement. No.1 Lode is displaced in at least three, probably four places, and thus takes up an en-echelon appearance on the ground. No.4 Lode also appears to have been displaced by a shallow dipping mineralised fault.

The East Lode is also displaced by a steeply dipping fault. Most of the shear zones and minor faults are mineralised with quartz and sometimes with sulphides. In the drill cores sulphide veins of varying orientations are fairly common, but their relation to the main lodes is uncertain.

Thus Forsythe's contention that the faulting is post-mineralisation would seem in the light of further work to be discounted. The main fault system is very complex and even now with good exposure, its exact position is in places obscure.

MINERALISATION AND LODES

Four Lodes are exposed at Queensberry - No.1, No.2, No.4 and East Lode. A No.3 Lode was known during mining, but it has never been rediscovered.

No.1, No.2 and No.4 Lodes each make an angle of between 50° and 60° to the main fault. It is therefore thought that these Lodes represent Secondary shears associated with the main fault, this fault acting as a channel for mineralising solutions and as an entrapment for them. From surface and Diamond Drill information it appears that nearer the fault the Lodes are much richer mineralised than further away. It is therefore conjectured that the ore bodies are due to entrapment of mineralising solutions against the fault, forming a series of en-echelon ore pockets.

No.1 Lode

No.1 Lode has a maximum surface exposure of 480', a surface dip of between 65° and 75° west and strikes between 350° and 0° . Surface widths vary from 2-3 feet in the south and one foot 300 feet north along strike. Underground information gave the dip as 60° west and a strike of 353° , (A.M. Reid). The Lode was mined to a depth of 100 feet in the Main Shaft, where two drives were put off into the Lode to explore the potential of the Lode at that depth, (A.M. Reid). At the far northern extremity, the Lode is present as a few thin quartz stringers. Mineralisation visible on the surface is poor, being minor Galena, Sphalerite and specks of pyrite in a banded quartz breccia gangue. Diamond Drill evidence shows that the quartz filled shear zone associated with the mineralisation is in some places up to 25 to 30 feet thick with quartz and breccia filling the zone.

Two mineralised bodies are known within the vicinity of the No.1 Lode, No.1 Lode itself, and the "offshoot", which is on surface a complex system of interlocking veins containing

a different mineralogical assemblage of Arsenopyrite, Galena and Sphalerite in Quartz. The surface extent of this body is small, being some 30 feet or less of mineralisation.

DIAMOND DRILL INFORMATION

Figure 2 shows a summary of all the intersections from Diamond Drill holes on No.1 Lode. The vertical Drill hole (DDH No.3), some 100 feet along strike from the main adit entrance, intersected a 12 foot shear zone at an R.L. of 762 feet. This quartz filled shear contained some 2.1' of valuable mineralisation.

The next angle drill hole (DDH No.8), which is 75 feet north along strike from DDH No.3, was drilled at an angle of 65° to an azimuth of 085° . This intersected mineralisation in three places at 141' - 147', 217.4' - 225.5' and ²330.9' - ³332.7' down *See section DDH No. 8* hole, giving estimated true widths of 4.6' of weak mineralisation and 2.6' and 1.4' of good grade zinc mineralisation. The first intersection corresponds with No.1 Lode and the second two are believed to represent the "offshoot". This however poses problems as it would infer that No.1 Lode was not intersected in DDH No.3, (see Figure 2). The final drill hole DDH No.4, 45 feet north along strike, intersected a shear zone similar to the upper intersection in DDH No.8, with some mineralisation at 183' down hole. The second intersection was not present in this hole.

No.2 Lode

This Lode outcrops 140' due west of No.1 Lode in an adit on the south bank of Lode Creek, has an exposed length of approximately 50 feet, is between one foot and 1.5 feet wide and dips 60° west striking 350° . Over most of its length it is fairly well mineralised with Galena and some Sphalerite in a Quartz gangue.

No.3 Lode

Although this Lode has not been relocated since Reid's time, a covered shaft was found in approximately the right position. Further investigation of this Lode has not been accomplished.

No.4 Lode

No.4 Lode, which outcrops (when extended along strike) 340' west of No.1 Lode, has a surface length of 220 feet, which has been extended by Diamond Drilling to 230 feet. It strikes due north, dips 60° west, and has a maximum surface width of 10 feet of shear, with 6 feet of mineralisation. In the most southerly outcrop the mineralisation is massive over some 5.5 feet, containing Galena, Chalcopryrite and Sphalerite. Sampling was undertaken prior to trenching, two channel and one bulk sample being obtained.

	<u>Cu%</u>	<u>Pb%</u>	<u>Zn%</u>	<u>Ag.oz/ton</u>
4' 6" channel on fault	0.42	17.2	21.2	2.28
5' 6" channel				
30' north of above	3.84	9.04	7.50	3.91
Grab sample of ore				
from Lode 4	2.46	12.64	10.25	2.94
6 ton bulk sample from				
No.4 Lode 20 feet				
north of fault	1.12	17.8	19.2	2.0

These assays demonstrate that near the fault the ore is of good grade over a good width. However, lower assay results have been obtained from the Diamond Drill holes, which intersected the ore body 100 feet north of these samples.

	<u>Average</u>	<u>Cu%</u>	<u>Pb%</u>	<u>Zn%</u>	<u>Ag/oz/ton</u>
DDH No.6 3.2'		0.22	5.16	1.19	0.7
DDH No.2 6.7'		0.187	5.4	7.85	0.95

DDH No.6 is 100' north and intersected 60' below the level of the channel samples, DDH No.2 is 85' north of No.6 on the same level. (Widths given are estimated true widths).

These two holes show decrease in the grade of the ore over a distance of nearly 200'.

A spectrographic scan was conducted on the grab sample of ore from this lode revealing the following elements and their approximate concentrations.

Si, Fe, Mg (App. 2%)

Al (App. 2%)

Ti (App. 2%)

Cr, Ni, Mo, W, Co - All less than 0.01%

As, Sb, Na, Zr, V - All present in low concentrations.

Mn and Sn were not detected.

No.4 Lode also has a Sphalerite rich offshoot near the creek which is a flat lying body approximately 3 feet in maximum exposed thickness, and 34 feet in length of outcrop, the exact geometry of this body is not known.

The shear zone, forming the lode channel, is found up to 30 feet wide, containing minor variably orientated quartz and ore mineralised veins. No.4 Lode is characterised by parallel aligned zones of Galena and Sphalerite mineralisation with patches of Chalcopyrite and Sphalerite scattered through a quartz gangue. The walls tend to be the richest mineralised parts of the lodes.

East Lode

East Lode, which outcrops some 425' north east of No.1 Lode adit, has a maximum exposed length of 220', strikes in the southern part at 032° and dips 90° to 70° east. Exposures in the creek bed and in the adit show the Lode is split into two veins, 2 feet and 1' 6" wide, 3 feet apart. To the south of the creek, the vein is 2' 6" wide and disjointed with stringer zones connecting patches of quartz mineralisation. On surface the Lode contains Galena and some Sphalerite. The mineralisation on surface here is much the same as that shown in No.1 Lode 150' north of the adit entrance. The banded nature of the inclusions and breccia fragments in the quartz gangue being more pronounced in the East Lode. In the northern part of the Lode, after the first crosscutting fault, it breaks down into a series of thin veins with a fairly constant orientation. However, evidence for displacement is found here as in the other Lodes.

The most interesting feature about the East Lode is brought out in the cross-section through the Lodes (Figure 3). The Lode here is sub-parallel to the main fault and dips to the east, completely different to the other three Lodes. The reason for this is not known.

East Lode is not well exposed on the surface, if No.1 or No.4 Lodes prove to be economic, then it would bear a closer examination.

As has been mentioned above, other mineralisation is present in faults and minor shears over most of the area, in places the main fault being mineralised with 2 - 4 inches of massive Galena. All the above mineralisation is restricted to the more competent pyroclastics which form the Wall rocks for all the observed Lodes. Quartz mineralisation is almost non-existent in the Black Shales apart from rare contorted thin veins.

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GEOCHEMISTRY

Samples were taken of the residual soil using a 3" hand auger, taking soil from just above the bed rock. The results of this work added very little to that done by Forsythe, except for some minor anomalies over the faults.

The anomalies due to the Lodes are small.

No.1 Lode gave an anomaly of lead and zinc. The western edge of the lead anomaly parallels the surface outcrops of No.1 Lode and its old workings. The anomalous portion giving readings greater than 240 ppm is 600 feet long and 110 feet wide in its maximum development. The anomalous values were low, being between 300 and 1400 ppm. The zinc anomaly is much smaller, being only 300 feet long and 50 feet wide, giving values of 300 - 1100 ppm, this anomaly parallels closely the old workings and surface exposure of the Lode.

No.4 Lode area

Here a squat lead anomaly was found 300 feet wide and in excess of 300 feet long, giving lead values of between 300 and 2,000 ppm, most being between 500 and 1,200. This anomaly bears no relation to No.4 Lode and its workings, being displaced some 200 feet uphill to the west and south. Some trenching was done over this anomaly, revealing quartz veining with some Galena, this probably was the cause of the anomaly. Also the main fault runs through this anomaly and as this is mineralised in places, could have an effect in this area. The zinc anomaly is small, giving two isolated patches of 300 - 400 ppm.

East Lode area

This Lode, if extended along 300 foot strike does correspond with a single reading of 300 ppm lead, however, no anomaly can be accurately defined for East Lode.

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APPENDIX I

Diamond Drill holes drilled at the Queensberry
prospect.

Doris 5916-5923

NO.1 LODEDDH No.3

Dip: Vertical
Co-ords: 28.7N 6.2E
R.L: 996.9 feet
Total Depth: 351 feet

Intersection with Assays

<u>From</u>	<u>To</u>	<u>Cu ppm</u>	<u>Pb%</u>	<u>Zn%</u>	<u>Ag/dwt/ton</u>	<u>Bi%</u>
234.0	238.0	25	0.084	0.10	3	0.0050
238.0	241.25	23	0.098	0.03	< 2	0.0050
241.25	244.0	22	0.012	0.01	< 2	0.0060
244.0	247.0	42	0.6	0.50	< 2	0.0120
247.0	250.25	25	0.012	0.11	< 2	0.0140
250.25	251.75	17	2.8	1.9	3	0.0060
251.75	252.25	60	27.7	2.8	44.6	0.0060
252.25	254.0	43	38.5	1.5	39.5	0.0060
254.0	257.0	8	0.013	0.01	< 2	0.0050
257.0	259.0	17	0.010	0.02	< 2	0.0180

DDH No.4

Dip: 66°
 Azimuth 88°
 Co-ords. 146 N 98 W
 R.L. 1015'
 Total Depth 302'

Intersection with Assays

From	To	Cu ppm	Pb%	Zn%	Ag.oz/ton
183.5	186.5	15	0.014	0.010	0.15
186.5	189.5	20	0.014	0.022	0.10
189.5	192.5	10	0.145	0.068	0.10
192.5	195.5	20	0.143	2.540	0.10
195.5	198.5	15	0.033	1.400	0.10
198.5	201.5	25	0.860	0.218	0.15
201.5	204.0	15	0.143	0.266	T
204.0	206.0	45	0.240	1.220	0.10
206.0	208.0	40	0.056	0.060	0.10
208.0	211.0	15	0.027	0.030	0.10

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DDH no.8

Dip: 65°
 Azimuth: 085°
 Co-ords: 98N 55W
 R.L. 1015.5'
 Total Depth: 248'

Intersection with Assays

<u>From</u>	<u>To</u>	<u>Cu%</u>	<u>Pb%</u>	<u>Zn%</u>	<u>As%</u>	<u>Ag.oz/ton</u>
141	143.5	<0.01	0.27	0.065	0.04	0.10
143.5	144.7	<0.01	0.66	1.72	<0.04	0.30
144.7	147	<0.01	0.99	1.02	<0.04	0.20
217.4	220.6	<0.01	0.46	0.015	<0.04	0.10
220.6	222.8	<0.01	3.19	0.545	<0.04	0.40
222.8	224.5	0.081	10.0	19.6	<0.04	2.5
224.5	225.5	0.015	0.70	19.5	<0.04	0.20
230.9	232.7	<0.01	1.61	28.2	<0.04	0.10

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LODE NO. 4DDH No.1

Dip Vertical
 Co-ords. 415.1S 461.8W
 R.L. 975.4'
 Total Depth 500'

Intersections and Assays

From	To	Cu%	Pb%	Zn%	As%	Ag.oz/ton
306.5	309.3	0.05	0.66	0.241	<0.04	0.10

DDH No.5

Dip Vertical
 Co-ords 391.8S 319.7W
 R.L. 948.9'
 Total Depth 98'

Intersections and Assays

From	To	Cu%	Pb%	Zn%	As%	Ag.oz/ton	
63.0	64.3	0.063	1.82	18.42	0.04	1.9	
64.3	65.0	0.055	2.60	1.56	0.04	0.65	
65.0	65.7	0.023	5.55	17.8	<0.04	1.4	
65.7	67.5	0.02	1.57	1.9	<0.04	0.30	
72.0	76.0	No core. A hole was encountered which could be old No.4 Lode workings.					

DDH No.6

Dip 67°
 Azimuth 107°
 Co-ords. 344 S 409 W
 R.L. 991.2'
 Total Depth 190.3'

Intersections and Assays

From	To	Cu%	Pb%	Zn%	As%	Ag.oz/ton
153.3	154.9	0.14	5.81	1.72	0.04	0.90

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DDH No.6 (cont)

From	To	Cu%	Pb%	Zn%	As%	Ag.oz/ton
154.9	155.6	0.94	4.70	0.61	0.04	0.65
155.6	158.3	0.09	4.88	1.02	<0.04	0.60

DDH No.2

Dip 72°
 Azimuth 095°
 Co-ords. 276 S 400 W
 R.L. 998.7'
 Total Depth 195'

Intersections and Assays

From	To	Cu%	Pb%	Zn%	As%	Sb%	Ag.oz/ton
158.75	159.5	0.04	1.58	1.91	0.065	0.012	0.385
159.5	161.5	0.238	15.3	12.5	0.080	0.022	2.42
161.5	163.1	0.519	3.25	9.6	0.040	0.024	0.83
163.1	164.0	0.023	0.63	1.21	0.030	0.012	0.155
164.0	166.1	0.01	1.49	0.98	<0.03	0.012	0.205
172.6	173.8	0.067	0.28	5.25	<0.03	<0.01	0.11

DDH No.7

Dip: 73°
Azimuth 090°
Co-ords. 230S 420W
R.L.
Total Depth 230'

Intersections and Assays

No significant mineralisation.

420

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Contractor: ASSOCIATED DIAMOND DRILLERS RIG: E.1000 F.20
 Date: Start: 13.3.70 Finish: 4.4.70 Type of Drill: Diamond

009021

DRILL LOG

From	To	Core Recov'd	Log	% Recovery	To	ASSAYS							
0	10	2.7'	Coarse green, weathered pyroclastics. Limonite.										
10	13	1.8'	As above. Some quartz veining limonite.										
13	15	1.4'	As above. Limonite										
15	17	1.7'	As above. Slightly fresher fine network quartz vein. Fractured glaces.										
17	19	1.0'	As above.										
19	21	1.4'	As above.										
21	22	0.5'	As above										
22	23.5	1.6'	As above										
23.5	26	2.2'	As above										
26	28	1.2'	As above										
28	29	0.9'	As above										
29	30	0.9'	As above										
30	31	1.0'	As above										
31	32	1.0'	As above										
32	35.2)	4.0'	As above										
35.2	35.5)		Barren quartz vein										
35.5	36)		Pyroclastics as above										
36	37	0.5'	As above with a quartz vein.										
37	39	1.8'	As above with a quartz vein.										
39	42	0.8'	As above with a small breccia zone.										
42	44	1.2'	As above										
44	45	0.3'	As above with quartz vein (fragmented one)										
45	45.5	0.5'	As above										
45.5	47.5	1.8'	As above										
47.5	51.1	3.3'	As above with 0.8' graphitic shale horizons fresh rock										
51.1	53.5	2.0'	Coarse pyroclastics										
53.5	60	0.6'	As above, minor quartz? feldspar?										

Property	S.P.L. 62			Location	Queensberry Mine			Hole No.	1
Records	415	S	Δ L	975.4'	Bearing	Inclination	Vertical	Page No.	1
	462	W							

Contractor: Rig:
 Date: Start: Finish: Type of Drill:

DRILL
LOG

From	To	Core Recov'd	Log	% Recovery	To	Assays								
53.5	60	0.6'	(cont) vein, some showing evidence of shear with aligned fibrous quartz and epidote or chlorite? Disseminated minor pyrite.											
60	62.7	2.7'	Finer pyroclastics with 0.6 quartz siderite vein at the end of section, minor quartz siderite veins.											
62.7	64.25	0.7'	Coarse pyroclastics.											
64.25	66.2	1.6'	As above.											
66.2	68	1.8'	As above. 0.5" quartz siderite vein at 30° to core axis.											
68	68.7	0.7'	As above, thin wispy shale horizons.											
68.7	70.2	1.3'	As above. Minor quartz veins.											
70.2	71.6	0.9	Breccia zone with quartz & country rock.											
71.6	75.0	3.4'	Coarse pyroclastic tuff, with minor patches of disseminated pyrite.											
75.0	84.25	8.5'	Graded sequences of coarse and fine tuffs. Bedding 45° c/a.											
84.25	85.3	1.0'	Slight breccia zone with quartz veins. Quartz vein to bedding core axis 45°.											
85.3	90.4	5.3'	Graded tuffs with some independent fine horizons. Bedding 20° core axis. Minor quartz vein.											
90.4	92.0	1.3'	Thinly laminated fine and coarse tuffs.											

Property	S.P.L. 62		Location	Queensberry Mine				Hole No.	1
Records		A L	Bearing		Inclination		Page No.	2	

Contractor..... Rig.....
 Date : Start..... Finish..... Type of Drill.....

DRILL
 LCG

From	To	Core Recov'd	Log	% Recovery	Assays									
					To									
92.0	96.5	4.2'	Predominantly fine slates or shales, silty sands in the formation, some minor quartz veins.											
96.5	105	8.0'	Mixed fine and coarse tuff contains shear zones, running through it with fibrous talc like a chlorite crystals covering the surface.											
105	106.4	) 8.7'	Medium to coarse tuff.											
106.4	106.8		Small vein with quartz.											
106.8	114.75		Sphalerite 70%, galena 5%.											
114.75	122	7.7'	Approx. 0.5' - 0.8' inclination beds of coarse tuff and shale. Predominantly banded shales with some coarser tuffs. Bedding 35° to core axis.											
122	125	2.8'	Coarse and fine tuff.											
125	128	2.8'	As above. Quartz vein 0.25" to core axis 35°.											
128	131	3.0'	Coarse tuff, minor quartz veins.											
131	133.75	2.9'	As above. Minor quartz veins, disseminated pyrite.											
133.75	136.6	2.7'	As above, minor disseminated pyrite.											
136.6	143.2	6.4'	As above, minor quartz veins.											
143.2	146.3	3.1'	As above, minor quartz & shale.											
146.3	156.5	9.0'	As above.											
156.5	162.5	6.0'	As above. fine graphitic horizons.											
162.5	166.2	3.7'	As above, minor quartz veins											
166.2	170.2	4.0	As above.											
170.2	180.2	10.0'	As above. Quartz veins.											
180.2	185.6	4.0'	As above.											

Property	S.P.L. 62		Location	Queensberry Mine			Hole No.	1
Records	A L	Bearing	Inclination				Page No.	3

U22

Contractor..... Rig.....
 Date : Start.....Finish.....Type of Drill.....

DRILL
 LCG

From	To	Core Recov	Log	% Recovery	To	Assays							
185.6	190.4	4.4'	As above.										
190.4	195.0	4.8'	As above.										
195.0	204.0	8.8'	As above. Some finer material. Quartz vein 10° to core axis.										
204'	214'	10.0'	As above. Many nebulous quartz stringers. Quartz veins forming a zone in many of the softer shaly horizons.										
214	216.8	2.8'	As above.										
216.8	227	10.0'	As above. At 223' small 7" with 5% sulphide, galena, sphalerite and chalcopyrite. Vein 25° to core axis. At 226' minor quartz vein with minor galena and pyrite <1%.										
227	231.5	4.5'	Coarse tuff with some shale & quartz stringers.										
231.5	237	5.5'	Medium grained pyroclastics with finer grained shaly horizons, quartz stringers in the finer layers.										
237	243.5	5.5'	As above completely.										
243.5	249	5.5'	As above.										
249'	258.1'	8.4'	Slightly finer silty tuff. After 257' a coarse pyroclastic contains large white crystalline fragments up to 0.3"										
258.1	268	9.9'	Coarse crystal tuff with some very minor quartz veins. Bedding 37° to core axis.										
268	278	9.8'	Crystal tuff coarse.										
278	288	10.0'	Coarse and fine tuff. Some quartz veining.										

Property	S.P.L. 62		Location	Queensberry Mine				Hole No.	1
Records	A L	Bearing	Inclination					Page No.	4

Contractor Rig
 Date : Start Finish Type of Drill

DRILL
LOG

From	To	Core Recov'd	Log	XX xxxxxxx From	To	Assays				
						Cu %	Pb %	Zn %	As %	Ag oz/ton
288	298	10.0'	Coarse crystal tuff at 296.5'. Small 2" shear zone with quartz and pyrite.							
298'	304'	5.8'	Coarse crystal tuff with little fragments. Some finer weathered minor quartz veins. Bedding 20° to core axis. At 303.7' a quartz vein begins.							
304'	306.5'	2.2'	Mineralised quartz vein with <1% sulphides pyrites, galena chalco, sphalerite vein 30° to core axis.							
306.5 307'	307 307.5'	0.5'	Coarse tuff.	306.5	309.3	0.05	0.66	0.241	< 0.04	0.10
		) 2.0'	Very coarse crystal and lithic tuff							
307.5 309.5'	309.5 319.5'	) 10.0'	Fine tuff. Fine tuff with thin beds of coarse lithic material, many thin quartz siderite veins.							
319.5	327.5	8.0'	As above.							
327.5	337.5	10.0'	As above.							
337.5	344.2	6.2'	Graded tuff units.							
344.2	254.5	10.3'	As above - minor quartz veins.							
354.5	364.7	10.2'	As above - minor quartz veins and shears.							
364.7 366.4'	366.3 376	1.6' 2.0'	As above. Between 366 - 375' no core at all, (fault zone), sludge shows no evidence of great mineral- isation after tuff as above.							
376.0 378	378 380	0.7' 1.0'	Tuff as above. As above, minor quartz.							

Property	S.P.L. 62	Location	Queensberry Mine	Hole No.	1
Records	A L	Bearing	Inclination	Page No.	5

Contractor: Rig:
 Date: Start: Finish: Type of Drill:

009026
 DRILL
 LOG

From	To	Core Recov'd	Log	% Recovery	To	Assays							
380	381.5	0.9'	As above with some finer material.										
381.5	383	1.5'	Graded tuff, minor quartz veining.										
383	384.6	1.6'	As above.										
384.6	386.6	0.7'	Pyroclastics for first section, then ground sludge, probably fault.										
386.6	388.4	0.5'	Graded tuff.										
388.4	391.5	2.0'	As above.										
391.5	392.0	0.4'	As above.										
392.0	393	0.5'	As above.										
393	393.6'	0.3'	As above.										
393.6'	394.25	0.6'	As above.										
394.25	394.75	0.2'	As above.										
394.75	396.3	1.6'	Medium tuff with fine dark shales.										
396.3	397.3	1.0'	As above with graphitic intraclasts of shale.										
397.3	398.8	1.5'	Medium grained tuff, micaceous.										
398.8	400.75	1.6'	As above, micaceous.										
400.75	401.6	0.1	Tuff.										
401.6	403	1.5'	Contorted bedded tuffs.										
403	403.3	0.1'	As above.										
403.3	405.2	1.5'	As above, with some graphitic horizons.										
405.2	406.8	1.7	Medium grade tuffs with minor quartz vein with pyrite. Bedding 40° to core axis.										
406.8	407.8	0.5'	Medium tuffs.										
407.8	408.2	0.3'	As above.										
408.2	409	0.6'	As above.										

Property	S.P.L. 62		Location	Queensberry Mine				Hole No.	1
Records	A L	Bearing	Inclination					Page No.	6

Contractor: Rig:
 Date : Start.....Finish.....Type of Drill.....

DRILL LOG

From	To	Core Recov'd	Log	% Recovery	To	Assays					
409	410.4	1.0'	As above with small vein with minor chalcopyrite and galena.								
410.4	411	0.3'	Medium grained tuff with graphitic shale. Intraclasts. Steep cleavage 10° to core axis.								
411	412	0.9'	As above.								
412	413.7'	1.4'	Medium grained tuff with some minor black slate. Bedding 20° to core axis. Cleavage steeper than bedding. At 403.7'. Small 1/4" vein of quartz with minor sphalerite. Dip 15° to core axis.								
413.7	414.7	1.0'	Fine tuffs and slates with a quartz vein containing minor galena at 414.3 ft. Runs into next vein.								
414.7	417.4	1.6'	As above with minor galena.								
417.4	418.7	1.0'	At 417.8 junction between silicified tuff and slates. 25° to core axis.								
418.8	420	0.9'	Light green silicified tuff with fine shale horizons.								
420	421.74	1.75	As above with minor quartz siderite veins.								
421.75	423.75	1.7	As above with quartz veins between 423.5 and 424.5.								
423.7	426	2.3	Silicified tuff with fine shale horizons.								
427.8	430.4	1.9	As above.								
430.4	434.6	2.7	As above.								
434.6	436.2	3.5	As above.								
436.2	441.2	4.8	As above.								

Property	S.P.L .62		Location	Queensberry Mine			Hole No.	1
Records		A L	Bearing		Inclination		Page No.	7

Contractor..... Rig.....
Date : Start..... Finish..... Type of Drill.....

From	To	Core Recov'd	Log	% Recovery	To	Assays							
441.2	443	1.1	As above.										
443	443.5	)	As above										
443.5	443.75	) 1.25	Dark black shales with minor quartz.										
443.75	447	2.1'	As above. Dark black shales										
447	448.25	1.0'	As above.										
448.25	449.8	0.7	As above.										
449.8	450.8	0.3'	As above.										
450.8	452.25	0.6'	450.8 - 451.7 as above. 451.7 - 452.25 silicified tuff with black shale intraclasts.										
452.25	453	0.2'	Silicified tuff.										
453	454.3	1.0'	As above with black shale intraclasts and fine black shale horizons.										
454.3	456.2	1.2'	As above.										
456.2	457.7	0.7'	As above.										
457.7	459.4	1.5'	As above.										
459.4	460.6'	0.4	As above.										
460.6	463.2	2.0'	At 460' start of a fault pug.										
463.2	464.3	)	Fault pug contact to core axis?										
464.3	466'	) 2.8'	60° Silicified tuffs as above.										
466'	469.25	3.1'	Silicified tuffs as above.										
469.25	470.4	1.0'	As above.										
470.4	472.5	1.6'	As above.										
472.5	473.6	1.0'	As above.										
473.6	476.2	2.6'	As above.										
476.2	479.0	2.7'	Coarse silicified tuff with minor quartz veins.										
479	480.6	1.6'	Coarse silicified tuff, minor quartz veins.										
480.6'	482	1.3'	Coarse silicified tuff.										

Property	S.P.L. 62	Location	Queensberry Mine	Hole No.	1
Records	A L	Bearing	Inclination	Page No.	8

Contractor..... Rig.....
 Date : Start.....Finish.....Type of Drill.....

DRILL
LOG

From	To	Core Recov'd	Log	% Recovery	To	Assays								
482	483	0.8'	As above.											
483	485.8	2.7'	As above.											
485.8'	489.75	4.0'	As above.											
489.75	493.1	3.2'	As above.											
493.2	498.25	4.3'	As above.											
498.25	500	1.6'	As above.											
			END OF HOLE.											

Property	SP.L. 62		Location	Queensberry Mine				Hole No.	1
Records			Reaming		Qualification			9	

Contractor: ASSOCIATED DIAMOND DRILLERS Rig: F.20
 Date: Start 7-5-70 Finish 12-5-70 Type of Drill Diamond

DRILL
 LCG

From	To	Core Recov'd	Log	% Recovery	Assays									
0	20	2.8'	Deeply weathered pyroclastics.											
20	24	1.6'	As above.											
24	40	No core												
40	44.4	4.0'	40.0 - 42.5 slightly weathered coarse tuff.											
			42.5 - 44.4 slightly weathered siliceous pyroclastics.											
44.4	47.4	3.0'	44.4 - 46.0 siliceous pyroclastics.											
			46.0 - 47.4 fresh coarse tuff.											
47.4	51.4	3.0'	Coarse tuff											
51.4	51.7	0.3'	As above											
51.7	53.7	1.5'	As above.											
53.7	56.4	No core												
56.4	57.75	0.5'	Siliceous tuff											
57.75	59.7	0.5'	As above.											
59.7	62.2	1.25'	As above 25° to core axis.											
62.2	64.75	2.1'	Coarse tuff.											
64.75	67.0	3.3'	As above.											
67.0	69.0	1.5'	As above.											
69.0	74.0	2.0'	As above.											
74.0	78.0	2.6'	As above.											
78.0	81.25	3.0'	As above											
81.25	83.2	1.8'	Med. tuff with slate pyritic intraclasts.											
83.2	85.7	2.6'	83.2' 1/8" quartz vein pyrite & chalco. As above siliceous in parts 32° to core axis.											
85.7	86.2	0.5'	Coarse tuff											
86.2	86.8	0.6'	As above.											
86.8	88.25	1.25	As above.											
88.25	89.6	1.5'	As above.											

Property	S.P.L. 62			Location	Queensberry Mine			Hole No.	2
Records	276 S 400 W	& L	998.7	Bearing	95°	Inclination	0' - 72°, 100' - 73°, 190' - 74°	Page No.	1

Contractor:
 Date : Start.....Finish.....Type of Drill.....

DRILL
 LOG

From	To	Core Recov'd	Log	- * * XXXXXXXXXX To		Assays						
				From	To	Cu %	Pb %	Zn %	As %	Sb %	Ag oz/ton	
89.6	90.25	0.4'	As above.									
90.25	91.0	0.6'	As above.									
91.0	92.0	0.5'	Mixed slates and coarse tuff.									
92.0	93.4	1.2'	Coarse tuff									
93.4	96.5	3.0'	Coarse tuff									
96.5	100	3.3'	As above.									
100.0	110.3	9.25	As above, minor quartz vein 20° to core axis, some siderite.									
110.3	112.3	2.0'	Coarse tuff with slate intra-clast.									
112.3	117	4.75'	112.3 - 113.3 Coarse tuff 113.3 - 115.9 Graded tuff. very coarse crystalline to fine . 30° to core axis. 115.9 - 116.4 Quartz vein with one bleb galena 40° to core axis. 116.4 - 117 Medium grained tuff.									
117.0	124.0	6.7'	As above, minor pyrite.									
124.0	129.2	5.2'	Graded tuff (fine - medium)									
129.2	134.0	4.7'	Coarse tuff, some siliceous patches.									
134.0	139.0	5.0	Coarse tuff, silicified with slate/pyrite intraclasts. At 134.7' ¼" quartz vein with galena, chalcopryrite & pyrite 10%. 25° to core axis.									
139.0	143.0	4.0'	Coarse tuff, siliceous patches. 60° to core axis.									
143.0	153.0	10.0'	As above, minor quartz veins.									
153.0	157.2	4.2'	As above, minor quartz veins.									
157.0	159.0	) 4.0'	As above.									
159.0	161.25	) 4.0'	Quartz lode with 50% mineralisation	158.75	159.5	0.04	1.58	1.91	0.065	0.012	0.385	
				159.5	161.5	0.238	15.30	12.50	0.080	0.022	2.420	
Property	S.P.L. 62		Location	Queensberry Mine						Hole No.	2	
Records		A L	Bearing		Inclination					Page No.	2	

MINOPS PT. LTD.

031

009032

DRILL LOG

Contractor: Rig:
 Date: Start.....Finish.....Type of Drill.....

From	To	Core Recov'd	Log	XXXXXXX To		Assays						
				From	To	Cu %	Pb %	Zn %	As %	Sb %	Ag oz/ton	
159.0	161.25		(cont)galena 22%, sphalerite 22%, chalcopryrite 6%. 52° to core axis.									
161.25	162.4	1.0'	Lode with 30% mineralisation, 20% sphalerite, 5% galena & 50% chalcopryrite.	161.5	163.1	0.519	3.25	9.60	0.040	0.024	0.83	
162.5	164.2	) 2.3'	Quartz lode 30% mineralisation, 12% sphalerite, 12% galena, 6% chalcopryrite. 65° to c/a.	163.1	164.0	0.023	0.63	1.21	0.030	0.012	0.155	
164.2	164.8)	Coarse tuff & fine tuff in bands with minor quartz veins with minor galena.	164.0	166.1	0.010	1.49	0.98	<0.030	0.012	0.205
164.8	166.8	2.0'	Quartz stringer zone with minor galena.									
166.8	170.1	3.8'	Coarse & fine light and dark siliceous tuffs, minor quartz vein.									
170.1	172.6	2.3'	Fine chloritic pyroclastics, minor quartz vein.									
172.6	173.2	0.6'	Quartz country rock vein. 15% mineralised sphalerite 10% galena, 5% minor pyrite. 40-70° to core axis.	172.6	173.8	0.067	0.28	5.25	<0.030	<0.010	0.110	
173.2	174.2	1.0'	Quartz vein 60° to core axis. <10% mineralisation galena & sphalerite.									
174.2	176.25		Coarse tuff.									
176.25	176.7		Quartz vein 45° to core axis, 2% galena & sphalerite.									
176.7	177.25		Coarse tuff									
177.25	178.5	1.0'	Siliceous tuff									
178.5	184.3	5.9'	Siliceous tuff many quartz veins with very minor galena & sphalerite.									

Property	S.P.L. 62	Location	Queensberry Mine			Hole No.	2
Records	A A	Bearing	Inclination		Page No.	3	

Contractor..... Rig.....
 Date : Start..... Finish..... Type of Drill.....

DRILL
LOG

From	To	Core Recov'd	Log	% Recovery	To	Assays				
184.3	185.7	1.0'	As above, mineralisation same.							
185.7	188.3	1.5'	Quartz stringer zone with siliceous tuffs and galena and sphalerite. 10° to core axis.							
188.3	190.7	1.8'	As above exactly.							
190.7	192.7	2.0'	Siliceous tuff 190.7' ¼" sphalerite quartz vein. 10° to core axis.							
192.7	195.0	3.2'	Siliceous tuff, no quartz veins.							
			END OF HOLE							

Property	S.P.L. 62		Location	Queensberry Mine			Hole No.	2
Records	R L	Bearing	Inclination			Page No.	4	

Contractor: ASSOCIATED DIAMOND DRILLERS Rig: F:20

DRILL LOG

Date: 24-3-70 Finish: 15-4-70 Type of Drill: DIAMOND

From	To	Core Recov'd	Log	% Recovery	To	Assays					
0	5	1.7'	Weathered pyroclastics.								
5	10	4.0'	As above.								
10	15	2.8'	As above.								
15	20	4.9'	As above.								
20	25	4.8'	As above.								
25	30	4.2'	As above.								
30	35	3.8'	As above.								
35	40	4.8'	As above.								
40	45	5.0'	As above.								
45	50	5.0'	As above.								
50	55	2.0'	Shear zone								
55	60	No core									
60	63	0.8'	Hole infill - shear zone								
63	65	2.0'	Fresh medium grained pyroclastics.								
65	70	5.0'	As above, minor quartz veining.								
70	75	5.0'	As above.								
75	80	5.0'	As above.								
80	81.3	1.3'	As above.								
81.3	89.5	8.2'	As above.								
89.5	98.2	8.7'	As above.								
98.2	107.5	9.2'	As above with more important quartz veining, one 4" vein at 102', 45° to core axis.								
107.5	109.5	2.0'	As above.								
109.5	117.25	7.6'	As above.								
117.25	127.25	10.0'	As above, 35° to core axis.								
127.25	133.75	) 8.4'	As above.								
133.75	136.0		Fine sand sized particles in tuff with small intercalusions of darker, silty material.								
136.0	142.0	6.0'	To 138' as above, below 138, coarse tuff.								
142.0	148.0	3.8'	As above.								

Property	S.P.L. 62		Location	Queensberry Mine			Hole No.	3
Records	29.7N 6.2E	B L	996.9	Bearing	Inclination	Vertical	Page No.	1

Contractor: Rig:
 Date : Start.....Finish.....Type of Drill.....

DRILL LOG

From	To	Core Recov'g	Log	xx		ASSAYS				
				xxxxxxx From	xx To	Cu ppm	Pb %	Zn %	Ag dwt/ton	Bi %
142.0	143.0	1.0'	Silicified tuff with quartz vein.							
143.0	148.0	3.8'	As above.							
148.0	151.0	2.3'	As above.							
151.0	154.0	3.0'	Medium sand grained tuff.							
154.0	161.0	7.0'	As above with many intraclasts of dark silty material.							
161.0	167.0	6.0'	Medium - coarse grained tuff & graded in parts.							
167.0	171.25	4.2'	As above.							
171.25	175.25	4.0'	As above.							
175.25	185.25	10.0'	As above.							
185.25	194.25	9.0'	As above.							
194.25	194.9	) 4.3'	Shear zone with quartz and silty material.							
194.9	198.5		Tuffs as previous.							
198.5	203.25	4.5'	Tuffs as above.							
203.25	208.75	5.3'	Tuffs in graded units with fine silty and shaly material.							
208.75	210.75	2.0'	Medium-coarse grained tuff & graded in parts.							
210.75	217.75	7.0'	As above last 3" quartz vein with minor pyrite.							
217.75	218.0	0.25'	As above - graded.							
218.0	224.0	3.9'	As above - graded, 60° to core axis.							
224.0	226.75	2.3'	As above - graded.							
226.75	232.5	5.6'	As above - graded with very fine material.							
232.5	234.5	2.0'	As above.							
234.6	235.5	0.8'	Start of quartz show - breccia zone with scattered minor pyrite and galena zone to core axis.	234	238	25	0.084	0.10	3	0.0050

Property	S.P.L. 62		Location	Queensberry Mine				Hole No.	3
Records		A L	Bearing		Inclination		Page No.	2	

Contractor: Rig:
 Date: Start: Finish: Type of Drill:

DRILL LOG

From	To	Core Recov'g	Log	%		Assays				
				From	To	Cu ppm	Pb %	Zn %	Ag dwt/ton	Bi %
234.6	235.5	0.8'	(cont) approx 40°.							
235.5	238.0	2.0'	Show zone as above.							
238.0	240.5	2.0'	Show zone as above.	238	241.25	23	0.098	0.03	< 2	0.0050
240.5	241.25	0.2'	Shear zone. Quartz etc.							
241.25	241.5	0.1'	As above.							
241.5	242.5	0.8'	Shear zone minor galena & pyrite <1% .	241.25	244.0	22	0.012	0.01	< 2	0.0060
242.5	243.5	0.6'	Shear zone, quartz vein.							
243.5	243.75	0.2'	As above.							
243.75	244.0	0.3'	As above.							
244.0	244.25	0.25'	As above - very minor pyrite.	244.0	247.0	42	0.600	0.50	< 2	0.0120
244.25	244.75	0.4'	As above.							
244.75	245.0	0.25	As above.							
245.0	246.3	1.2'	As above - minor galena & pyrite.							
246.3	247.5	0.8'	As above.							
247.5	247.75	0.3'	Coarse grained tuff.	247.0	250.25	25	0.012	0.11	< 2	0.0140
247.75	250.25	2.3'	As above with quartz veining.							
250.25	252.25	)	Coarse tuff veined with quartz	250.25	251.75	17	2.800	1.900	3	0.0060
		) 4.0'	& sphalerite 90% sulphide	251.75	252.25	60	27.700	2.800	44.6	0.0060
252.25	254.5	)	More richly mineralised quartz	252.25	254.0	43	38.500	1.500	39.5	0.0060
			vein with galena and sphalerite	254.0	257.0	8	0.013	0.0100	< 2	0.0050
			60°. Mostly galena. Banding within lode 10°-15° to core axis.							
254.5	258.5	3.6'	Quartz shear with country rock	257.0	259.0	17	0.010	0.020	< 2	0.0180
			minor pyrite.							
258.5	259.0	0.5'	Coarse grained tuff, some quartz veining.							
259.0	261.75	2.5'	Graded tuffs less quartz veining.							
261.75	262.75	0.9'	As above.							
262.75	265.75	3.0'	As above.							
265.75	274.0	8.0'	As above. Bedding 40° to c/a.							
274.0	284.0	9.3'	As above.							
284.0	293.0	7.0'	As above.							

Property	S.P.L. 62		Location	Queensberry Mine			Hole No.	3
Records	A L		Bearing	Inclination			Page No.	3

Contractor.....
 Date : Start.....Finish.....Type of Drill.....

From	To	Core Recov'd	Log	% Recovery	To	Assays							
293.0	296.0	2.1'	As above.										
296.0	300.0	4.0'	As above.										
300.0	301.5	1.5'	As above.										
301.5	306.3	4.2'	As above, 40° to core axis.										
306.3	308.75	2.5'	As above.										
308.75	315.0	5.9'	As above.										
315.0	316.25	1.0'	As above.										
316.25	318.0	1.5'	As above.										
318.0	321.5	3.5'	As above.										
321.5	326.0	4.0'	As above.										
326.0	329.5	2.8'	As above.										
329.5	335.0	5.5'	As above.										
335.0	337.25	2.2'	As above.										
337.25	340.0	2.1'	As above.										
340.0	341.0	0.9'	As above.										
341.0	342.0	1.0'	As above.										
342.0	343.0	1.1'	As above.										
343.0	346.0	2.8'	As above, bedding 40° to c/a.										
346.0	357.0	4.7'	As above										
			END OF HOLE										

Property	S.P.L. 62		Location	Queensberry Mine				Hole No.	3
Records	A L	Bearing	Inclination					Page No.	4

037

Contractor: ASSOCIATED DIAMOND DRILLERS Rig: F.20
 Date: Start: 13-5-70 Finish: 25-5-70 Type of Drill: Diamond

009038
 DRILL
 LCG

From	To	Core Recov'd	Log	xx xxxxxxx		Assays				
				From	To	Cu ppm	Ag oz/ton	Pb %	Zn %	
0	32	26.0	Weathered pyroclastics, limonitic staining.							
32	39	7.0	Partly weathered, coarse pyroclastics, limonitic staining.							
39	107	64.0	Medium grained, grey, pyroclastics, with quartz/siderite veins and stringers, minor amount of limonitic staining							
107'	123'3"	16.0'	As above but with inclusions of black slate - possibly due to slumping - no limonite staining.							
123'3"	133'3"	8.0'	Coarse grained pyro. alternating with black slate bands, quartz veins.							
133'3"	141'	7.0'	Green medium grained pyro. - small inclusions of slate.							
141'	175'	32.0'	Grey, coarse grained pyroclastics with minor slate bands, quartz veins & stringers, minor siderite stringers.							
175'	185'	10.0'	As above	183.5'	186.5'	15	0.15	0.014	0.01	
185'	211'9"	25.0'	CORE SPLIT	186.5'	189.5'	20	0.10	0.014	0.022	
			Rock type is grey medium grained pyro. with slate patches	189.5'	192.5'	10	0.10	0.145	0.068	
			Quartz veins.	192.5'	195.5'	20	0.10	0.143	2.540	
			At 195' small galena/sphalerite veins.	195.5'	198.5'	15	0.10	0.033	1.400	
				198.5'	201.5'	25	0.15	0.860	0.218	
				201.5'	204.0'	15	T	0.143	0.266	
211'9"	247'9"	27.0'	Broken core of medium grained grey, pyro with minor slate inclusions & quartz veins & stringers, minor siderite stringers.	204.0'	206.0'	45	0.10	0.240	1.220	
				206.0'	208.0'	40	0.10	0.056	0.060	
				208.0'	211.0'	15	0.10	0.027	0.030	

Property	S.P.L. 62			Location	Queensberry Mine			Hole No.	4
Records	146 N 98 W	& L	1014.9	Bearing	088°	Inclination	66°	Page No.	1

Contractor Rig
 Date : Start Finish Type of Drill

DRILL 009039
 LCG

From	To	Core Recov'd	Log	% Recovery	Assays							
247'9"	302.0'	47.0'	As above. END OF HOLE									

Property	S.P.L. 62		Location	Queensberry Mine				Hole No.	4
Records		M L	Bearing		Inclination		Page No.	2	

Contractor: ASSOCIATED DIAMOND DRILLERS Rig: F. 20
 Date: Start: 6-4-70 Finish: 15-4-70 Type of Drill: DIAMOND

009040

DRILL LOG

From	To	Core Recov'd	Log	% Recovery	To	Assays							
0	7'	2.4'	Very weathered proclastics.										
7	10	1.5'	As above										
10	14	3.8'	As above										
14	18	4.0'	As above.										
18	19	1.0'	As above.										
19	22	3.0'	Less weathered coarse tuff.										
22	22.4	0.4'	As above.										
22.4	24.6	1.4'	As above.										
24.6	25.6	0.5'	As above (fresher)										
25.6	28.0	0.8'	As above										
28.0	30.0	1.6'	As above.										
30.0	32.0	1.5'	As above.										
32.0	33.5	1.3'	As above.										
33.5	35.7	2.2'	As above. Slightly silicified										
35.7	36.8	1.1'	As above, not silicified.										
36.8	37.8	1.0'	As above.										
37.8	39.5	1.7'	As above.										
39.5	40.0	0.5'	As above.										
40.0	41.5	1.2'	As above.										
41.5	43.0	1.4'	As above.										
43.0	45.0	2.0'	As above.										
45.0	46.5	1.5'	As above.										
46.5	47.0	0.5'	As above.										
47.0	48.5	1.5'	As above.										
48.5	50.25	1.8'	As above.										
50.25	54.7	3.9'	As above.										
54.7	56.25	1.8'	As above.										
56.25	58.75	2.6'	As above.										
58.75	59.55	)	As above.										
59.55	59.85	)	Quartz vein with sphalerite and galena 50% sulphide 30% - 50%.										

Property	S.P.L. 62			Location	Queensberry Mine			Hole No.	5
Bearing	392 S	4 L	948.9	Bearing	Inclination	Vertical	Page No.	1	

Contractor:
 Date : Start Finish Type of Drill

DRILL LOG

From	To	Core Recov'd	Log	xx xxxxxxx		ASSAYS				
				From	To	Cu %	Pb %	Zn %	As %	Ag oz/ton
59.85	61.5	) 2.8'	Coarse tuffs with minor galena blebs <1%							
61.5	63.0	)	As above.							
63.0	63.5	)	Quartz vein with 20% zinc sulphide, less galena, 30° to core axis.	63.0	64.3	0.063	1.82	18.42	0.04	1.9
63.5	65.0	) 4.2'	Quartz siderite vein with galena and minor sphalerite, up to 90% mineralisation. 85% galena.	64.3	65.0	0.055	2.60	1.56	0.04	0.65
65.0	65.7	)	Quartz with up to 20% sphalerite and 10% galena. 25° to core axis.	65.0	65.7	0.023	5.55	17.8	<0.04	1.4
65.7	67.1	) 1.4'	Quartz shear zone with 5% galena	65.7	67.5	0.02	1.57	1.90	<0.04	0.30
67.1	69.0	) 1.9'	Minor quartz impregnation and silicification also as above quartz vein 70° to core axis.							
69.0	72.0	) 3.0'	Silicified coarse tuff.							
72.0	76.0	No core	Hole ? old workings.							
76.0	77.0	) 1.0'	Silicified coarse tuff with minor disseminated galena and quartz stringers.							
77.0	78.75	) 1.7'	As above.							
78.75	79.55	) 1.8'	As above.							
79.55	80.7	)	As above.							
80.7	82.25	) 1.5'	Coarse tuff.							
82.25	84.75	) 1.8'	Coarse tuff.							
84.25	85.6	) 1.3'	As above.							
85.6	87.0	) 1.4'	As above, minor silicified zones.							
87.0	88.0	) 0.6'	Coarse tuff.							
88.0	88.8	) 0.7'	At 88.4' quartz vein with 10% galena. ½" dip 65° to core axis. Coarse tuff.							

Property	S.P.L. 62		Location	Queensberry Mine			Mole No.	5
Records	E L	Bearing	Inclination				Page No.	2

Contractor.....Rig.....
 Date : Start.....Finish.....Type of Drill.....

DRILL LOG

From	To	Core Recov'd	Log	% Recovery	To	Assays								
88.8	89.6	1.8'	Coarse tuff with minor quartz veins & disseminated galena. Quartz vein 60° to core axis. 1% galena.											
89.6	89.9													
89.9	90.5	1.5'	Coarse tuff											
90.5	92.0													
92.0	92.5	0.5'	Coarse tuff, some silicified.											
92.5	93.0	No core	-----											
93.0	95.5	2.5'	Coarse tuff silicified zones.											
95.5	97.0	1.5'	Coarse tuff, slight silicified.											
97.0	97.8	0.4'	Coarse tuff.											
97.8	98.0	0.2'												
			END OF HOLE											

Property	S.P.L. 62		Location	Queensberry Mine						Hole No.	5
Records	A L		Bearing		Inclination					Page No.	3

MINOPS PTY., LTD.

Contractor: ASSOCIATED DIAMOND DRILLERS

Rig: F.20

009043

Date: Start: 20-4-70 Finish: 2-5-70 Type of Drill: DIAMOND

DRILL LOG

From	To	Core Recov'd	Log	% Recovery	Assays									
					To									
0	1	0.6'	Weathered coarse pyroclastics.											
1	2	0.8'	As above & infill.											
2	3	0.8'	As above											
3	4	0.5'	As above											
4	5	No core	-----											
5	7	1.0'	Infill & weathered coarse pyroclastic.											
7	8	0.7'	As above.											
8	10	0.4'	As above											
10	16	1.0'	Infill & coarse weathered pyroclastic.											
16	30	0.3'	As above.											
30	34	4.0'	Weathered leached siliceous tuff limonitic.											
34	37.8	3.3'	As above, much limonite.											
33.8	42.0	5.0'	As above, at 41' quartzitic leached zone, probably once contained mineralisation. Bedding core axis 30°. Veins at 30° to core axis.											
42.0	47.0	5.0'	Leached siliceous tuff.											
47.0	50.8	3.8'	As above.											
50.8	53.5	2.7'	As above.											
53.5	59.2	5.0'	Highly siliceous tuff, many limonitic fractures.											
59.2	62.0	2.8'	As above.											
62.0	66.4	4.4'	As above.											
66.4	68.4	2.0'	As above.											
68.4	71.3	3.0'	As above.											
71.3	73.0	1.6'	As above.											
73.0	75.3	2.0'	As above.											
75.3	76.5	1.0'	As above.											
76.5	79.6	2.8'	As above, less weathered grey coloured tuff.											

Property	S.P.L. 62			Location	Queensberry Mine			Hole No.	6	
Records	344 S	409 W	& L	991.2	Bearing	107°	Inclination	67°	Page No.	1

Contractor Rig

Date : Start Finish Type of Drill

DRILL LOG

From	To	Core Recov'd	Log	% Recovery	Assays									
					To									
79.6	82.4	2.8'	Pale siliceous tuff minor pyrite veins.											
82.4	86.0	3.7'	Pale siliceous tuff with siliceous shale. Intraclasts often pyritic, pyrite veins.											
86.0	88.5	2.3'	As above.)											
88.5	89.6	1.1'	As above.)											
89.6	92.0	2.4'	As above.)											
92.0	93.2	0.9'	As above.) Minor quartz											
93.2	96.0	2.8'	As above.) veining.											
96.0	101.0	5.0'	As above.)											
101.0	102.8	1.8'	As above.)											
102.8	106.7	3.2'	As above.)											
106.7	107.2	) 0.7'	As above. Bedding 40° to core axis.											
107.2	107.4	)	Less siliceous. Darker coarse tuff											
107.4	110.5	3.0'	Coarse tuff with silicified patches. Minor quartz veining.											
110.5	115.8	5.2'	As above.											
115.8	123.3	7.5'	115.8-116.8 As above. 116.8-119.0 silicified zone. 119.0-123.3 Coarse tuff. At 117.1 1/4" galena lode, 30° to core axis. Bedding approx 45° to core axis.											
123.3	126.0	2.7'	Coarse tuff.											
126.0	130.0	2.7'	Coarse tuff.											
130.0	134.0	3.0'	As above.											
134.0	135.2	1.0'	As above.											
135.2	137.0	1.8'	As above.											
137.0	139.5	0.6'	As above.											
139.5	142.0	0.7'	As above.											

Property S P L 62 Location Queensberry Mine Hole No. 6

Records A L Bearing Inclination Page No. 2

Contractor Rig
 Date : Start Finish Type of Drill

DRILL LOG

From	To	Core Recov'd	Log	XXXXXXX TO		Assays				
				From	To	Cu %	Pb %	Zn %	As %	Ag oz/ton
142.0	144.0	0.4	As above.							
144.0	148.0	None	-----							
148.0	148.5	0.5'	As above.							
148.0	151.8	1.5'	Coarse tuff and graphitic slate.							
151.8	153.3	1.3	Coarse tuff. 0.05" galena.							
153.3	153.8	0.5'	Barren quartz lode.	153.3	154.9	0.14	5.81	1.72	0.04	0.90
153.8	155.6	1.8'	Quartz lode with mineralisation of 25-30% galena (10%) Sphalerite (5%) chalcopryrite (10%)	154.9	155.6	0.94	4.70	0.61	0.04	0.65
155.6	157.4	1.1'	Quartz lode with 10% in galena, sphalerite and chalcopryrite.	155.6	158.3	0.09	4.88	1.02	0.04	0.60
157.4	158.3	0.9'	Barren lode. Very minor sphalerite and galena. Lode between 20° and 40° to core axis.							
158.3	163.0	4.7'	Siliceous tuff with slate intraclasts.							
163.0	165.8	)	As above.							
165.8	166.5	) 5.0	Laminated tuff with shale intraclasts.							
166.5	169.8	)	Siliceous tuff with intraclasts.							
169.8	171.2	1.4'	As above.							
171.2	173.5	1.9'	As above.							
173.5	174.5	1.0'	Laminated tuff and slate, graded bedding to core axis 40°							
174.5	175.7	1.0'	Finely laminated fine silty tuff, with thin 1/4" coarser silicified bands. Disseminated pyrite blebs.							
175.7	176.8	1.1'	Coarse siliceous tuff and finer intraclasts.							
176.8	180.0	3.2'	176.8-177.8 as above. 177.8-180.0 Coarse tuff with minor quartz veins.							

Property	S.P L. 62		Location	Queensberry Mine			Hole No.	6
Records	& L	Bearing	Inclination				Page No.	3

045

MINOPS. PTY., LTD.

009046

Contractor.....
 Date : Start.....Finish.....Type of Drill.....

DRILL
LOG

From	To	Core Recov'd	Log	% Recovery	No	Assays								
180.0	181.8	1.8'	Coarse tuff at 181.1 - 2.5"											
181.8	184.0	2.0	quartz vein. 40° to core axis.											
184.0	185.2	1.1'	As above. Disseminated pyrite.											
185.2	187.25	2.0'	As above. Small veinlets of pyrite.											
			Coarse tuff interbedded with											
			dark fine tuffs. Small veinlets											
			of pyrite. Bedding 40° to core											
			axis.											
187.25	188.25	1.0'	As above, pyrite.											
188.25	188.4	0.1'	As above.											
188.4	190.3	1.9'	As above.											
			END OF HOLE											

Property	S P.L. 62		Location	Queensberry Mine			Hole No.	6
Records		A L	Bearing		Inclination		Page No.	4

Contractor: ASSOCIATED DIAMOND DRILLERS Rig: F.20
 Date: Start: 18-5-70 Finish: 29-5-70 Type of Drill: Diamond

009047

DRILL LOG

From	To	Core Recov'd	Log	% Recovery	Assays					
					To					
0	13.5	4.0'	Coarse weathered, limonite stained tuffs.	30						
13.5	40.0	1.0'	As above + quartz veining.	4						
40.0	42.0	1.85'	As above.	92						
42.0	46.7	4.7'	As above.	100						
46.7	50.0	3.3'	As above, 4" showing weathered chlorite.	100						
50.0	50.5	) 1.7'	As above.							
50.5	52.0		Medium grained siliceous tuff, little limonite.	85						
52.0	61.0	1.0'	Grey tuff - heavily limonite stained & broken	11						
61.0	63.0	1.6'	Coarse grained grey tuff, limonite staining	80						
63.0	67.0	) 4.1'	Light grey medium grained tuff.							
			Limonite stained, last 6" shows contact parallel axis between grey tuff and reddish tuff.	59						
			Reddish brown tuff.							
67.0	70.0		Grey tuff.	80						
70.0	71.5	1.2'	Medium grain grey tuff.	36						
71.5	77.0	2.0'	Heavily limonited tuff.	7						
77.0	86.5	0.65'	Medium grain limonited grey tuff.							
86.5	90.65	2.1'	Medium grain limonited grey tuff.	55						
90.65	94.0	2.8'	Coarse grain grey tuff.	84						
94.0	96.0	1.3'	As above.	65						
96.0	98.0	2.0'	Medium grain grey tuff - limonited.	100						
98.0	100.0	1.8'	Medium grain grey tuff - siderite veining	90						
100.0	102.0	2.0'	Medium grained grey tuff - quartz veining	100						

Property	S.P.L. 62			Location	Queensberry Mine				Hole No.	7
Records	230 S 420 W	AL	1010	Bearing	090°	Inclination	73°	Page No.	1	

047

MINOPS. PTY. LTD.

Contractor.....Rig.....
 Date : Start.....Finish.....Type of Drill.....

009048
 DRILL
 LOG

From	To	Core Recov'd	Log	% Recovery	To	Assays								
102.0	104.25	)	Coarse grey tuff.											
104.25	105.0	) 1.5'	As above + minor disseminated pyrite.	50										
105.0	107.0	) 1.7'	Medium grain, grey tuff, minor quartz veins.	85										
107.0	109.75	) 2.75'	As above.	100										
109.75	111.0	) 1.5'	As above.	100										
111.0	111.65	) 1.25'	As above.											
111.65	112.25	)	Black tuffaceous material, large quartz vein. Core badly broken.	100										
112.25	113.25	) 1.0'	Medium grain grey tuff.	100										
113.25	115.0	) 1.0'	As above.	57										
115.0	116.33	) 1.33'	As above.	100										
116.33	117.63	)	As above.											
117.63	117.65	) 1.9'	Traces of minor disseminated pyrite in tuffs.	100										
117.65	118.15	)	As above.											
118.15	119.1	) 1.0'	Medium grained grey tuff.	100										
119.1	119.85	) 0.55'	As above.	73										
119.85	121.25	) 0.5'	Fine grain grey tuff, quartz veins.	36										
121.25	122.25	) 1.0'	As above.	100										
122.25	123.1	) 0.9'	As above, banding at 60°.	100										
123.1	125.0	) 1.5'	As above	79										
125.0	125.66	) 0.75'	As above	100										
125.66	126.75	) 1.1'	As above.	100										
126.75	128.33	) 0.6'	As above.	43										
128.33	129.66	) 1.3'	As above.	100										
129.66	130.6	) 1.0'	As above.	100										
130.6	132.25	) 1.3'	As above.	100										
132.25	132.59	)	As above	100										
132.59	132.9	) 0.58	Large quartz vein in tuff - broken	89										

Property	S.P.L. 62		Location	Queensberry Mine			Hole No.	7
Records	A L	Bearing	Inclination				Page No.	2

MINOPS. PTY., LTD.

Contractor Rig
 Date : Start Finish Type of Drill

DRILL
LOG

From	To	Core Recov'd	Log	% Recovery	Assays					
					To					
132.9	133.33	0.4'	Fine grain grey tuff	100						
133.33	134.45	1.1'	As above.	98						
134.45	134.83	0.35'	As above.	92						
134.83	135.91	1.1'	As above.	100						
135.91	137.5	1.6'	As above.	100						
137.5	138.0	0.45'	As above	90						
138.0	140.0	1.85'	As above	92						
140.0	141.33	1.33'	As above	100						
141.33	142.33	1.45'	As above	100						
142.33	144.08	1.8'	As above	100						
144.08	145.83	1.8'	As above	100						
145.83	146.15	)	As above							
146.15	146.5	) 1.7'	Grey tuffaceous clay	100						
146.5	148.1	)	As above							
148.1	148.42	) 1.75	Fine grain grey tuff.	91						
148.42	150.42	) 1.1'	As above, quartz veined	55						
150.42	152.42	) 0.6'	As above	30						
152.42	153.42	) 1.0'	As above	100						
153.42	153.85	)	As above							
153.85	154.17	) 0.7'	As above	100						
154.17	155.75	) 1.45'	As above	92						
155.75	156.33	) 0.58'	As above	100						
156.33	157.58	) 1.25'	As above	100						
157.58	158.75	) 1.17'	As above	100						
158.75	159.25	)	As above							
159.25	160.1	) 1.4'	Quartz vein complex as above	100						
160.1	160.40	)	As above							
160.40	161.58	) 0.56'	Fine grain grey tuff	38						
161.58	162.83	) 1.25'	As above	100						
162.83	163.92	) 1.1'	As above	100						
163.92	165.25	) 1.2'	As above + trace disseminated pyrite.	100						

Property	S.P.L. 62		Location	Queensberry Mine			Hole No.	7
Records		& L	Bearing		Inclination		Page No.	3

Contractor: Rig:
 Date : Start.....Finish.....Type of Drill.....

DRILL
LOG

From	To	Core Recov'd	Log	% Recovery	Assays					
165.25	168.0	2.8'	Fine grain grey tuff	100						
168.0	169.83	1.75'	As above	96						
169.83	171.42	1.6'	As above	100						
171.42	173.42	2.0'	As above	100						
173.42	174.25	) 1.45'	Quartz vein complex							
174.25	175.42		Fine grain grey tuff	73						
175.42	177.42	2.0'	As above & fine & medium contorted quartz vein	100						
177.42	178.67	1.2'	Fine grain grey tuff, one major quartz vein.	100						
178.67	179.25	0.6'	Fine grain grey tuff.	100						
179.25	179.83	0.5'	As above	100						
179.83	182.42	2.6'	As above	100						
182.42	184.17	1.8'	As above	100						
184.17	185.74	) 2.0'	As above							
185.74	186.5		As above + fine & medium contorted quartz veins.	86						
186.5	187.5	1.0'	Fine grain, grey tuff	100						
187.5	189.33	1.53'	As above.	84						
189.33	192.17	2.85	As above + complex of fine & medium quartz veins	100						
192.17	193.42	1.3'	As above	100						
193.42	196.0	2.6'	Fine grain grey tuff	100						
196.0	198.66	2.6'	As above	100						
198.66	201.46	) 4.0'	As above							
201.46	202.66		As above + systems of large quartz veins at 45°	100						
202.66	206.66	4.0'	Fine grain grey tuff, fine quartz veins at 45°.	100						
206.66	207.15	0.5'	As above.	100						
207.15	211.25	4.1'	Fine grained grey tuff	100						
211.25	213.75	) 3.65'	Medium grained grey tuff	100						
213.75	214.83		Fine grey tuff							

Property	S.P.L. 62		Location	Queensberry Mine			Hole No.	7
Records	& L	Bearing	Inclination				Page No.	4

MINOPS PTY. LTD.

Contractor.....
 Date : Start.....Finish.....Type of Drill.....

009051
 DRILL
 LOG

From	To	Core Recov	Log	% Recovery	To	Assays							
214.83	221.2	)	Fine grain, grey tuff, some	100									
		) 8.0'	minor quartz veining.										
221.2	222.83	)	As above.										
222.83	224.83	) 1.75'	As above + two medium quartz	88									
		)	veins at 40°.										
224.83	229.15	) 4.3'	Medium grain grey tuff	100									
229.15	230.0	) 0.8'	Fine grain grey tuff	100									
			END OF HOLE AT 230'										

Property	S.P.L. 62		Location	Queensberry Mine				Hole No.	7
Records		A L	Bearing		Inclination		Page No.	5	

051

Contractor..... ASSOCIATED DIAMOND DRILLERS MINOPS. PTY. LTD.
 Rig..... F20
 Date : Start..20-4-70.....Finish..2-5-70.....Type of Drill....DIAMOND.....

009052
 DRILL
 LOG

From	To	Core Recov'd	Log	% Recovery	To	Assays					
0	2	0.8'	Weathered coarse pyroclastics								
2	4	1.2'	Infill & weathered pyroclastics								
4	6	0.4'	As above.								
6	10	2.0'	As above.								
10	15	2.5'	As above.								
15	17.5	2.5'	As above.								
17.5	20.5	2.6'	As above.								
20.5	23.0	2.5'	As above.								
23.0	23.25	0.2'	As above.								
23.25	25.5	2.2'	As above.								
25.5	30.0	3.4'	As above.								
30.0	35.0	2.4'	As above.								
35.0	40.0	1.3'	As above.								
40.0	43.0	2.6'	As above.								
43.0	44.5'	1.4'	As above.								
44.5	53.0	4.5'	As above.								
53.0	56.0	2.7'	As above.								
56.0	61.0	4.0'	Fresh coarse pyroclastics.								
61.0	65.0	4.0'	As above.								
65.0	70.0	2.6'	As above.								
70.0	71.6	) 2.5'	Weathered silicified pyroclastics.								
71.6	73.0		Fresh coarse tuff.								
73.0	77.0	4.0'	As above.								
77.0	79.0	2.0'	As above.								
79.0	83.0	3.0'	As above.								
83.0	83.9	) 4.7'	Siliceous tuff								
83.9	88.3		Coarse tuff								
88.3	91.75	3.0'	As above.								
91.75	102.0	8.4'	As above.								
102.0	106.0	3.2'	As above.								
106.0	108.0	1.6'	As above.								
108.0	109.0	0.7'	As above.								
109.0	109.5	0.4'	As above.								

Property	S.P.L. 62			Location	Queensberry Mine			Hole No.	8
Records	98 N 55 W	R L	1015.5	Bearing	085°	Inclination	65°	Page No.	1

Contractor: Rig:
 Date : Start Finish Type of Drill

009053
 DRILL
 LOG

From	To	Core Recov'd	Log	X Backlog	To	Assays					
						Cu	Pb	Zn	As	Ag	
						%	%	%	%	oz/ton	
109.5	119.0	8.5'	As above.								
119.0	123.0	3.8'	As above at 120.5, 1/2" quartz vein dip 15° to core axis.								
123.0	125.8	2.7'	As above.								
125.8	130.75	4.4'	As above.								
130.75	136.0	5.2'	As above, minor silicification zone. Minor quartz veins.								
136.0	141.0	4.8'	136'-138' slates and coarse pyroclastics.								
141'	142'	) 1.9'	138'-141' khaki coloured tuff.	141.0	143.5	< 0.01	0.27	0.065	0.04	0.10	
142.0	143.5		)	Quartz breccia and silicification zone 20° to core axis.							
143.5	144.4)	Vein containing 10% mineralisation quartz with sphalerite and galena.	143.5	144.7	< 0.01	0.66	1.720	< 0.04	0.30
144.4	146.0	) 2.3'	Breccia with quartz minor sphalerite and pyrite.	144.7	147.0	< 0.01	0.99	1.020	< 0.04	0.20	
146.0	146.5		)	Quartz & siliceous breccia.							
146.5	147.0	) 1.4'	Quartz vein with 5% sphalerite and galena, dip to core axis 45°.								
147.0	148.0	)	Light siliceous tuff.								
148.0	158.0	9.9'	Light banded siliceous tuff. Bedding to core axis 30°.								
158.0	162.5	4.3'	As above.								
162.5	170.0	7.5'	Light siliceous tuff. Some minor quartz veins.								
170.0	173.25	3.2'	Light siliceous tuff, barren quartz vein and at 172' an 1/8" vein bearing galena and pyrite with some sphalerite. Dip 30° to core axis.								
			172.7' - 1/10" veinlet of sphalerite and a quartz vein 21° to core axis.								

Property	Location				Queensberry Mine				Hole No.	8
Records	A L		Bearing		Inclination				Page No.	2

053

MINOPS PTY. LTD.

Contractor..... Rig.....
 Date : Start.....Finish.....Type of Drill.....

009054
 DRILL
 LOG

From	To	Core Recov'	Log	* XXXXXXZ		Assays				
				From	To	Cu %	Pb %	Zn %	As %	Ag oz/ton
173.25	175.75	7.4'	Light siliceous tuff. As above.							
175.75	181.0		Dark medium grade tuff - also siliceous.							
181.0	191.0	10.0'	Medium grade tuff graded in places.							
191.0	201.0	10.0'	Coarse and graded tuff some patches of silicification - micaceous. Bedding 5° to c/a.							
201.0	211.0	10.0'	Even grained coarse tuffs, minor veins of quartz. 30° to core axis. Some large siderite veins 60° to core axis.							
211.0	221.0	10.0'	211.0 - 218.0' coarse tuffs.	217.4	220.6	<0.01	0.46	0.015	<0.04	0.10
			218.0' two crossing veins of quartz with patches of galena and sphalerite.	220.6	222.8	<0.01	3.19	0.545	<0.04	0.40
221.0	228.0	6.0'	221.0' - 221.4' coarse tuff.	222.8	224.5	0.081	10.00	19.600	<0.04	2.50
			221.4' - 0.3" quartz vein galena 60%, 50 to core axis.	224.5	225.5	0.015	0.70	19.500	<0.04	0.20
			222.6' vein 60% mineralisation with 40% galena.							
			223.6 - 224.3 lode with massive sphalerite 50% galena 10% lode to core axis 50°.							
			224.3-224.9 country rock penetrated by sphalerite veins approximately 10% mineralisation.							
			224.9 vein in the above widens out to 3". Dip 10° - 15° core axis. mineralised 20%, mostly sphalerite minor galena.							
			224.9-228.0 coarse tuff with minor specks of sphalerite.							

Property	Location			Queensberry Mine			Hole No.	8
Records	A L	Bearing	Inclination				Page No.	3

Contractor Rig
Date : Start Finish Type of Drill

From	To	Core Recov'd	Log	Recovery		Assays				
				From	To	Cu %	Pb %	Zn %	As %	Ag oz/ton
228.0	238.2	10.2'	228.0-230.9' coarse tuff. bedding 35° to core axis.	230.9	232.7	<0.01	1.61	28.2	<0.04	0.10
238.0	248.0	10.0'	230.9-232.6 lode 35° to core axis. Sphalerite and galena lode 80% - 90% sulphides. sphalerite 80%, galena 15%. 232.6-238.0 coarse tuff. Coarse tuff.							
			END OF HOLE							

Property		Location	Queensberry Mine				Hole No.	8
Records	A L	Bearing		Inclination		Page No.	4	

055

009056

N.P. 1144



DEPARTMENT OF MINES—TASMANIA

LAUNCESTON OFFICES
287 WELLINGTON STREET
SOUTH LAUNCESTON 7250

TELEPHONES:
Metallurgical Research } 44 2431-2
Laboratory } (2 lines)
Mines Inspection }
Explosives & Inflammable Liquids }

19th JANUARY 1970

ATTENTION	A.F.D.
<u>C.F.</u>	T.R.V.
	?
	BOARD

Minops Pty. Ltd.,
401 Collins Street,
Melbourne, Vic. 3000.

Dear Sirs,

R.604.

Please find attached the preliminary report on flotation tests on your Queensbury (Marquis) ore.

From this work it is apparent that three concentrates (Copper-lead, lead and zinc) can be made by flotation without much difficulty. This is the Rosebery practice. In ores of this type a clean copper-lead separation would not be expected. A high grade zinc concentrate is possible. However, a bulk sulphide concentrate that could be smelted by the Imperial process may be worth considering. This would make a single copper-lead-zinc concentrate.

However, without smelting and realization charges the alternative concentrate possibilities cannot be followed further. However before any future work is done a preliminary study of the market should be made so that concentrate objectives can be stated.

Yours faithfully,

(H.K. Wellington)
Chief Chemist & Metallurgist.

Enc.

LAUNCESTON, 19th January, 1970.

ORE DRESSING INVESTIGATIONR.604Minops Pty. Ltd.Recovery Tests on Ore from the Queensbury Mine.Introduction

A bulk sample of sulphide ore contained in eleven 44 gallon drums were received from Minops. The ore was from the Queensbury Mine near Zeehan and was stated to be about 6 tons in weight. An assay of the ore and preliminary recovery tests were initially required.

The sulphides present in the ore were sphalerite, galena and chalcopryrite and were generally in separate masses with little intermingling of the different sulphides.

Sample Preparation

The bulk sample was crushed in the pilot crushing plant to -5 mesh. The crushing plant is so arranged to provide four approximately equal samples. These samples were drummed and weighed.

The total weight of the sample was found to be approximately 4 tons 4 cwts.

Cut No.4 was reduced by riffing to provide a head sample and a representative sample from which samples for preliminary recovery tests were taken. The assay of the head sample was as follows:-

<u>% Zn</u>	<u>% Pb</u>	<u>% Cu</u>	<u>Ozs/ton Ag</u>	<u>Dwts/ton Au</u>
19.2	17.6	1.12	2.0	Nil

Note 1. No responsibility will be accepted for the results shown in this report insofar as they apply to the sample tested.

Note 2. Test screens used were from the British Standard Screen Series.

Note 3. Make-up water in the flotation tests was Launceston tap water.

Test Work

Four flotation tests were carried out. In each case 1,000 grams of ore were ground in the Warman Laboratory ball mill for 10 minutes at a pulp density of 75% solids. The ball charge was 10 kilograms.

In test 1, the sodium ethyl xanthate used in lead and zinc flotation was found to be stale and flotation response was poor. Fresh sodium ethyl xanthate was used in lead and zinc flotation in the remaining three tests. Flotation impeller speed was 1200 rpm. in N1 and 1500 rpm. in the remaining tests.

Details of flotation conditions are shown in the following table:

<u>Conditions</u>		<u>N1</u>	<u>N2</u>	<u>N3</u>	<u>N4</u>
Sodium sulphite	lbs/ton	1.0	2.0	3.0	3.0
Conditioning time	minutes	25	25	25	25
Sodium aerofloat	lbs/ton	0.2	0.5	0.2	0.1
Aeration time	minutes	5	5	5	5
Cresylic acid	lbs/ton	0.05	0.05	0.05	0.05
Flotation Time F1	minutes	8	8	8	8
Zinc sulphate	lbs/ton	1.0	1.0	1.0	1.0
Conditioning time	minutes	2	2	2	2
Sodium ethyl xanthate	lbs/ton	0.5*	1.0	0.5	0.2
Flotation time F2	minutes	8	8	8	10
Copper sulphate	lbs/ton	1.0	1.0	1.0	1.0
Conditioning time	minutes	2	2	2	2
Sodium ethyl xanthate	lbs/ton	0.5*	-	-	0.5
Flotation time F3	minutes	10	10	10	10
Sodium ethyl xanthate after 5 mins. flotation	lbs/ton	-	1.0	-	-

* sodium ethyl xanthate was stale

The flotation tailing from test N4 was sized to give an indication of the size of grind used in the tests.

Results

The results of the four flotation tests are shown in the following table.

Test	Product	% Weight	Assay %					Distribution %				
			Cu	Pb	Zn	Fe	S	Cu	Pb	Zn	Fe	S
N1	Cu Conc. F1C	8.0	9.6	33.0	11.8	10.5	22.7	71.0	16.2	5.1	29.1	12.9
	Pb Conc. F2C	11.1	2.0	45.5	9.4	4.4	16.8	20.5	31.0	5.6	16.8	13.2
	Zn Conc. F3C	16.3	0.21	13.2	42.5	2.6	25.2	3.1	13.2	37.2	14.9	29.1
	Tail F3T	64.6	0.09	10.0	15.0	1.7	9.8	5.4	39.6	52.1	39.2	44.8
	Head H	100.0	1.07	16.3	18.6	2.9	14.1	100.0	100.0	100.0	100.0	100.0
N2	Cu Conc. F1C	10.5	8.2	39.0	11.2	8.7	21.7	76.9	25.2	6.4	31.7	16.3
	Pb Conc. F2C	27.2	0.42	40.0	23.2	2.0	19.9	10.2	67.0	34.2	19.2	38.7
	Zn Conc. F3C	24.0	0.49	4.5	45.0	2.9	25.3	10.5	6.6	58.6	24.1	43.4
	Tail F3T	38.3	0.07	0.50	0.41	1.9	0.58	2.4	1.2	0.8	25.0	1.6
	Head H	100.0	1.12	16.2	18.4	2.9	14.0	100.0	100.0	100.0	100.0	100.0
N3	Cu Conc. F1C	6.0	10.2	41.5	6.0	10.5	21.3	55.7	15.0	2.0	22.0	9.1
	Pb Conc. F2C	35.8	0.94	36.5	24.0	2.3	21.2	30.6	78.9	47.7	29.2	54.1
	Zn Conc. F3C	17.7	0.62	3.0	49.5	3.2	27.3	10.0	3.2	48.7	19.9	34.5
	Tail F3T	40.5	0.10	1.17	0.70	2.0	0.81	3.7	2.9	1.6	28.9	2.3
	Head H	100.0	1.10	16.6	18.0	2.8	14.0	100.0	100.0	100.0	100.0	100.0

(Contd., p.4)

Test	Product	% Weight	Assay %					Distribut %				
			Cu	Pb	Zn	Fe	S	Cu	Pb	Zn	Fe	S
	Cu Conc. F1C	5.4	9.8	34.5	6.4	11.1	21.2	52.2	11.8	1.8	21.2	8.2
	Pb Conc. F2C	23.7	1.2	51.7	10.8	2.3	17.5	28.0	77.3	13.7	19.6	29.5
N4	Zn Conc. F3C	28.7	0.54	4.4	53.0	2.9	28.6	15.3	8.0	81.2	29.7	58.4
	Tail F3T	42.2	0.11	1.11	1.46	2.0	1.31	4.5	2.9	3.3	29.5	3.9
	Head H	100.0	1.01	15.8	18.7	2.8	14.1	100.0	100.0	100.0	100.0	100.0

The sizing of the flotation tail from test N4 was as follows:

	<u>% Weight</u>	<u>% Weight Cumulative</u>
+ 72 mesh	1.4	1.4
- 72 mesh +100 mesh	8.9	10.3
-100 mesh +150 mesh	14.9	25.2
-150 mesh +200 mesh	16.4	41.6
-200 mesh	58.4	100.0

Discussion

It must be emphasised that the four flotation tests are of a preliminary nature only in order to determine the recoverability of the metals in the ore. The reagents and the amounts used and the size of the grind are not necessarily the optimum conditions.

The four tests were completed without waiting on assay results, and reagent additions were modified in successive tests depending on visual flotation response.

The results of test N1 have been included in the report because the copper flotation results were one of the best of the series. Lead and zinc flotation results suffered because of the use of stale sodium ethyl xanthate.

The results indicate that about 70% of the copper can be recovered in a copper concentrate assaying about 9% copper and 35% lead.

About 90% of the lead can be recovered in the copper concentrate plus the lead concentrate. A lead concentrate of 51.7% was obtained.

If the lead concentrate is sold to a smelter that recovers both the lead and the zinc in the concentrate, then about 5% of the zinc can be recovered in the lead concentrate plus the zinc concentrate. In test N4, a zinc concentrate assaying 53.0% zinc and 2.9% iron was made with a recovery in that concentrate of 84.2% of the zinc. The low-iron content in the zinc concentrate would make this product particularly acceptable to a zinc smelter.

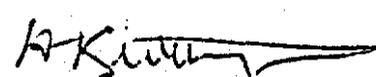
The concentrates produced in these tests were rougher concentrates and cleaner flotation of the concentrates should raise the grade of each concentrate.

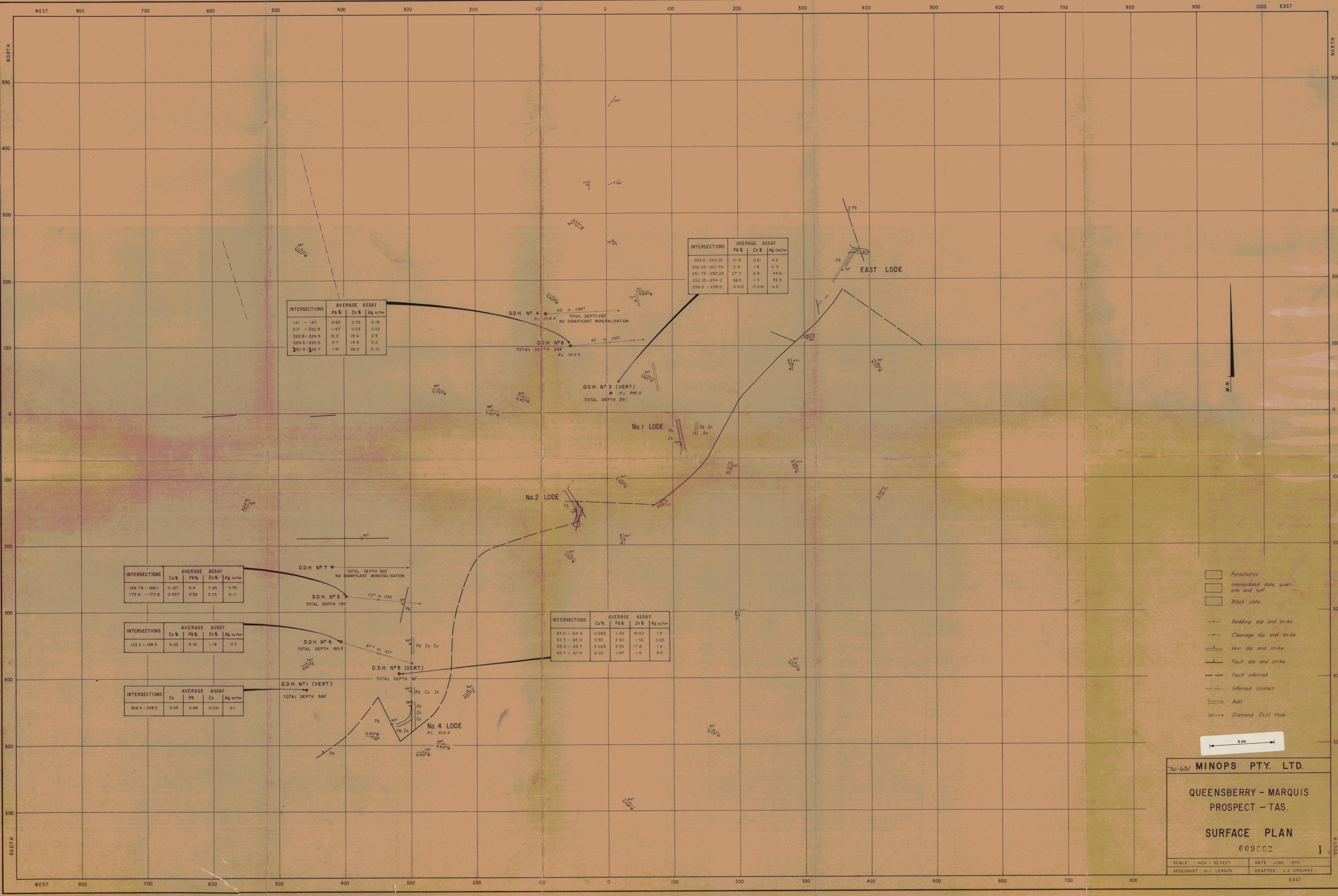
The results show that pyrite is present (if at all) only in a very minor amount. The absence of pyrite simplifies the flotation treatment of this ore.

The results and the flotation response during tests indicate that amounts of some flotation reagents could probably be reduced.

Summing up, satisfactory recoveries of copper, lead and zinc can be obtained from this ore. Further research work would need to be done to determine the optimum grind and reagent additions, but this could not be done satisfactorily until sales policies were decided and the type of concentrates to be produced were known.


(L.J. Rhodes),
Senior Metallurgist


(H.K. Wellington),
Chief Chemist & Metallurgist.



INTERSECTIONS	AVERAGE ASSAY		
	Pb %	Zn %	Ag oz/ton
141 - 147	0.62	0.76	0.18
217 - 222.8	1.57	0.23	0.22
222.8 - 224.5	10.0	19.6	2.5
224.5 - 225.5	0.7	19.5	0.2
230.9 - 232.7	1.61	28.2	0.10

INTERSECTIONS	AVERAGE ASSAY		
	Pb %	Zn %	Ag oz/ton
234.0 - 250.25	0.15	0.21	< 2
250.25 - 251.75	2.8	1.9	< 3
251.75 - 252.25	27.7	2.8	44.6
252.25 - 254.0	38.5	1.5	39.5
254.0 - 259.0	0.012	0.014	< 2

INTERSECTIONS	AVERAGE ASSAY			
	Cu %	Pb %	Zn %	Ag oz/ton
158.75 - 166.1	0.187	5.4	7.85	0.95
172.6 - 173.8	0.067	0.28	5.25	0.11

INTERSECTIONS	AVERAGE ASSAY			
	Cu %	Pb %	Zn %	Ag oz/ton
153.3 - 158.3	0.22	5.16	1.19	0.7

INTERSECTIONS	AVERAGE ASSAY			
	Cu	Pb	Zn	Ag oz/ton
306.5 - 309.3	0.05	0.66	0.241	0.1

INTERSECTIONS	AVERAGE ASSAY			
	Cu %	Pb %	Zn %	Ag oz/ton
63.0 - 64.3	0.063	1.82	18.42	1.9
64.3 - 65.0	0.55	2.60	1.56	0.65
65.0 - 65.7	0.023	5.55	17.8	1.4
65.7 - 67.5	0.02	1.57	1.9	0.3

- Pyroclastics
- Interbedded slate, quartzite and tuff
- Black slate
- Bedding dip and strike
- Cleavage dip and strike
- Vein dip and strike
- Fault dip and strike
- Fault inferred
- Inferred contact
- Adit
- Diamond Drill Hole

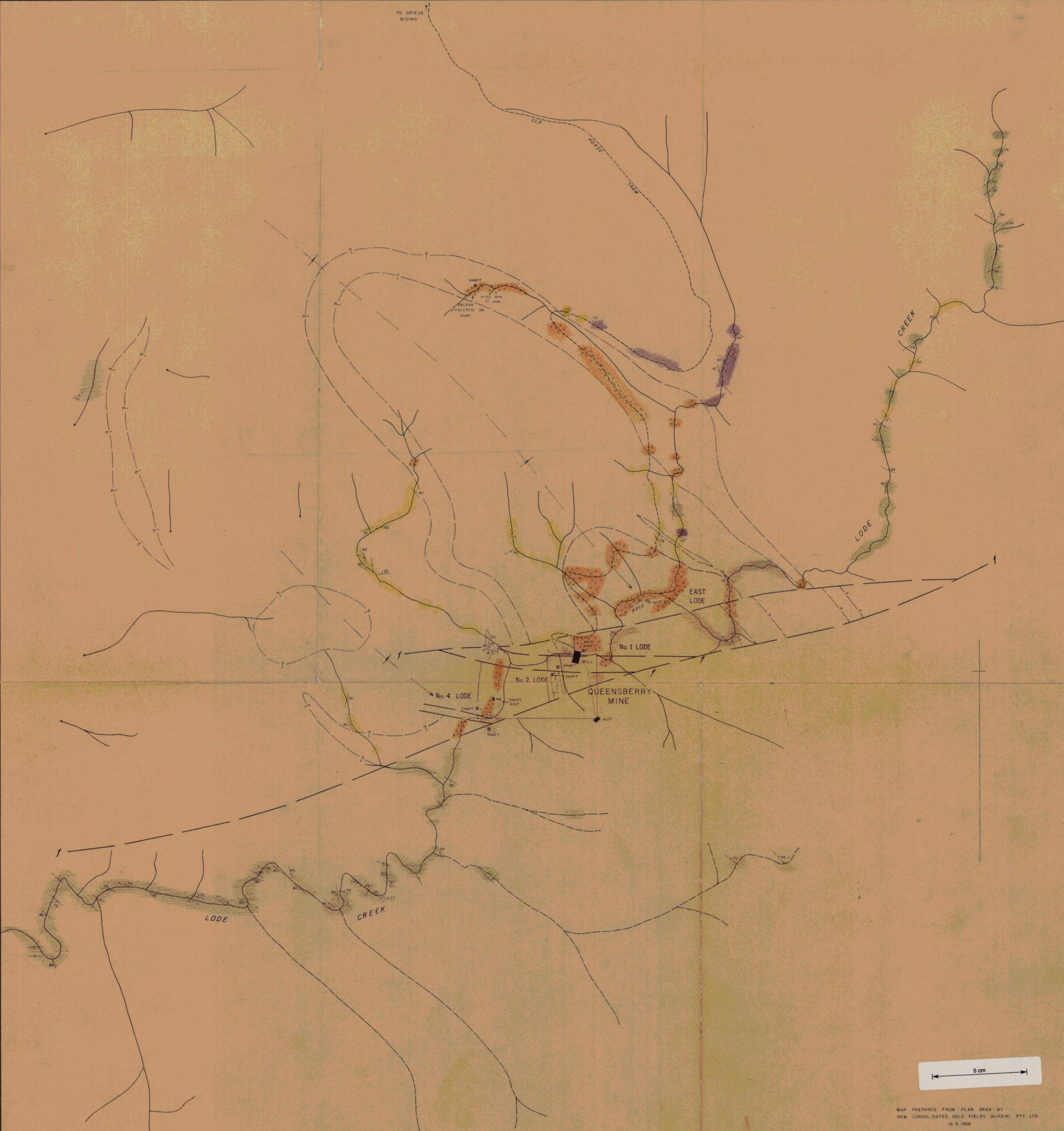
70-631 **MINOPS PTY. LTD.**

QUEENSBERRY - MARQUIS PROSPECT - TAS.

SURFACE PLAN

009002

SCALE 1 INCH = 50 FEET	DATE JUNE 1970
GEOLOGIST M.J. LENNOX	DRAFTED C.A. O'ROURKE



LEGEND

	CRYSTAL TUFF
	BLACK SHALE (with minor interbedded sandstone)
	INTERBEDDED SHALE & SANDSTONE
	MICACEOUS SANDSTONE (QUARTZITE) (with minor interbedded shale)

10-631

MINOPS

009063

GEOLOGICAL PLAN

OF

QUEENSBERRY MINE

366300
5 744 200

Prof/a

2100 2

SCALE - 200ft to 1 inch DATE DECEMBER 1969

MAP PREPARED FROM PLAN DRAW BY
NEW CONSOLIDATED GOLD FIELDS (A/ASIA) PTY LTD
16.5.1968

D.D.H. 1

D.D.H. 5

No. 4 Lode



900 R.L.

45°

70°

Cu % Pb % Zn % Ag oz/ton

0.061	7.38	18.42	1.9
0.65	2.60	1.56	0.65
0.23	5.55	17.8	1.4
0.02	1.57	1.9	0.3

800 R.L.

700 R.L.

53°

70°

Cu % Pb % Zn % Ag oz/ton

0.05	0.66	0.241	0.10
------	------	-------	------

600 R.L.

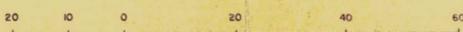
500 R.L.

- COARSE TUFF
- GRADED TUFF
- V COARSE CRYSTAL TUFF
- SILICIFIED TUFF
- SHEAR ZONE
- MINERALISED VEIN
- MINERALISED VEINLETS
- DIP INTO PAPER

009064



SCALE OF FEET



HORIZONTAL AND VERTICAL

MINOPS PTY LTD

70-631

QUEENSBERRY PROSPECT

SECTION OF D.D.H. 1 AND 5

DIP : VERTICAL 2102

AZIMUTH

TOTAL DEPTH : 500 FEET, 98 FEET

STARTED

FINISHED

3

SCALE : 1 INCH = 20 FEET

GEOLOGIST : M.J. LENNOX

DATE : MAY 1970

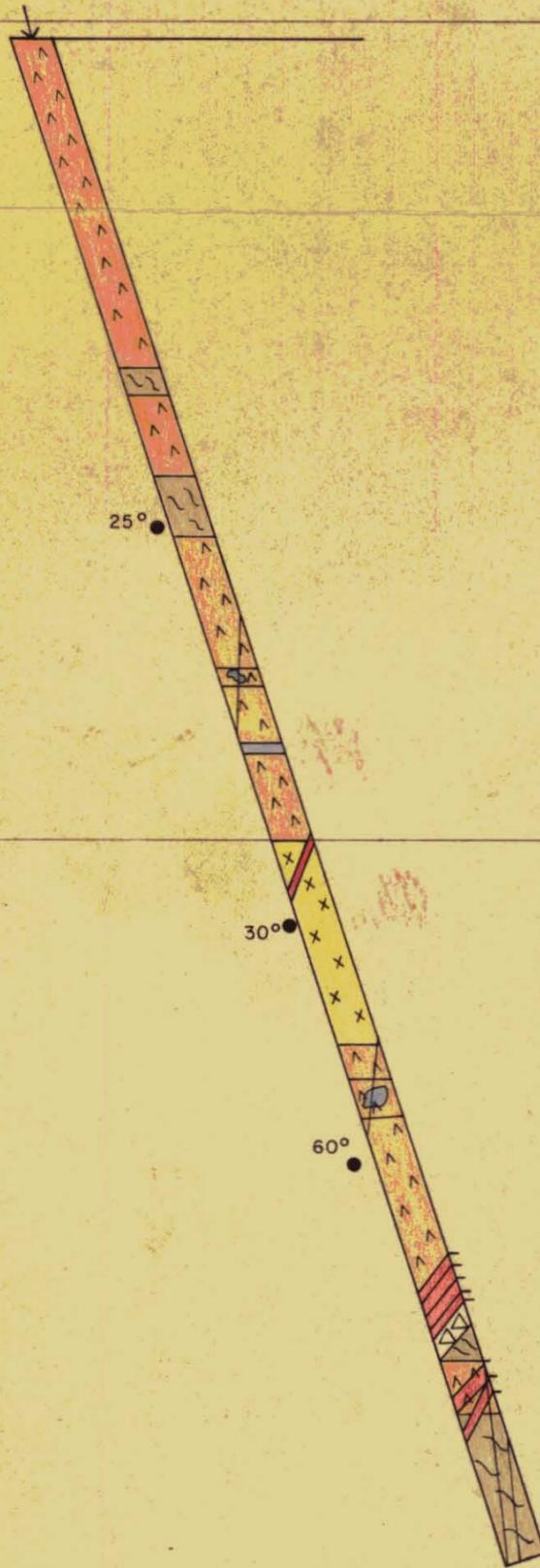
RE-DRAWN : H.12.70 S. NOTARI

1000 R.L.

900 R.L.

800 R.L.

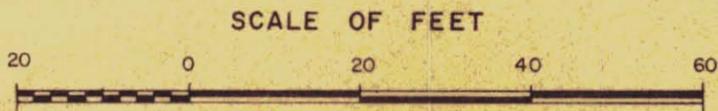
-  COARSE TUFF
-  SILICEOUS TUFF
-  SLATE
-  SLATE INTRACLASTS
-  GRADED TUFF
-  MINERALISED VEIN
-  BRECCIA STRINGER ZONE
-  MINERALISED VEINLETS
-  ● 23 BEDDING DIP INTO PAPER



Cu %	Pb%	Zn%	Ag oz/ton
0.04	1.58	1.91	0.38
0.238	15.3	12.5	2.42
0.519	3.25	9.6	0.83
0.023	0.63	1.21	0.155
0.01	1.49	0.98	0.203
0.067	0.28	5.25	0.11

009065

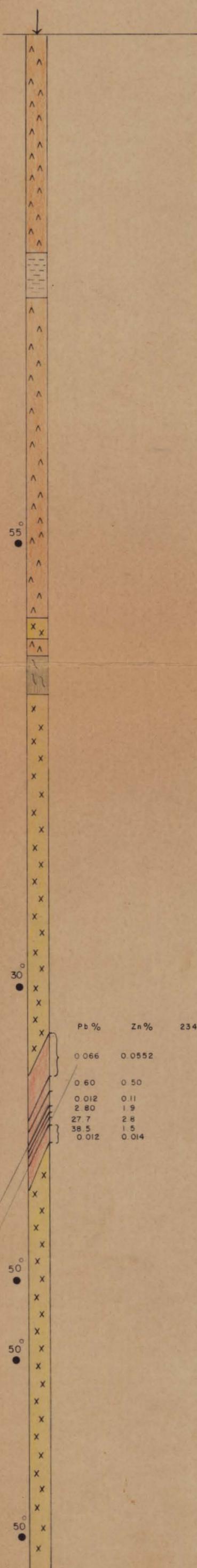
5 cm



MINOPS PTY LTD
 70-631
QUEENSBERRY PROSPECT
SECTION OF D.D.H.2
 2103 DIP: 72° 100' 73° 195' 74°
 AZIMUTH: 095°
 TOTAL DEPTH: 195'
 STARTED: FINISHED: 12.5.70

SCALE: 1 INCH = 20 FEET GEOLOGIST: M.J. LENNOX
 DATE: MAY 1970 RE-DRAWN: 10. DEC. 1970

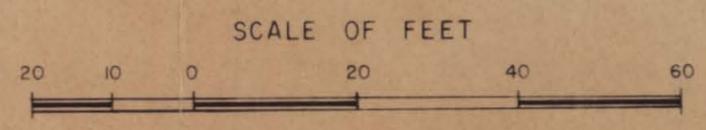
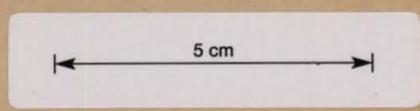
4



-  COARSE TUFF
-  SILICIFIED TUFF
-  GRADED TUFF
-  SHEAR ZONE
-  MINERALISED VEIN
-  55° DIP INTO PAPER
-  = ASSAY INTERVAL
-  } AVERAGE ASSAY

Pb %	Zn %	234 - 260 SHEAR ZONE
0.066	0.0552	
0.60	0.50	
0.012	0.11	
2.80	1.9	
27.7	2.8	
38.5	1.5	
0.012	0.014	

009066



MINOPS PTY LTD	
70-631	
QUEENSBERRY PROSPECT	
SECTION OF D.D.H.3	
DIP : VERTICAL	2104
AZIMUTH :	
TOTAL DEPTH : 357'	
STARTED : 24.3.70	FINISHED : 15.4.70 5
SCALE : 1 INCH = 20 FEET	GEOLOGIST : M.J. LENNOX
DATE : MAY 1970	RE-DRAWN : 10.12.70 S. NOTARI

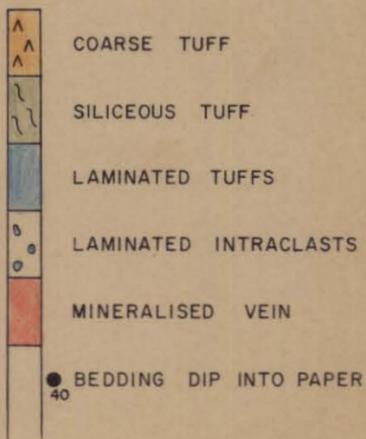
344 S
409 W

900'

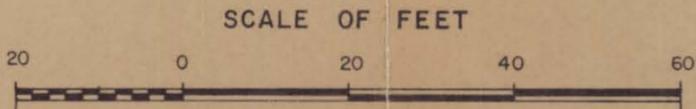
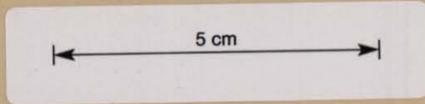
800'



Cu %	Pb %	Zn %	Ag oz/ton
0.14	5.81	1.72	0.90
0.94	4.7	0.61	0.65
0.09	4.88	1.02	0.60



009067



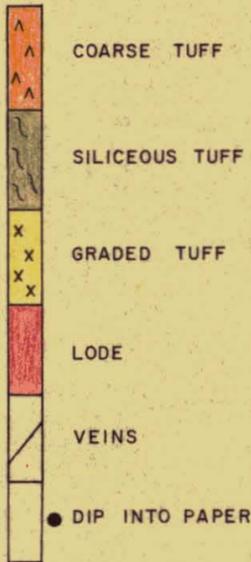
MINOPS PTY LTD
 70-631
 QUEENSBERRY PROSPECT
 SECTION OF D.D.H.6
 DIP : 67°
 AZIMUTH : 107° 107° 6
 TOTAL DEPTH : 190'
 2105

SCALE : 1 INCH = 20 FEET	GEOLOGIST : M.J. LENNOX
DATE : APRIL 1970	RE-DRAWN : 10. DEC. 1970

1000' R.L.

900' R.L.

800' R.L.

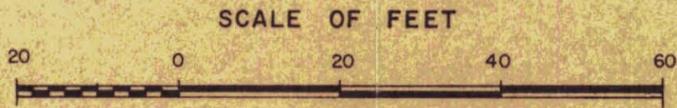
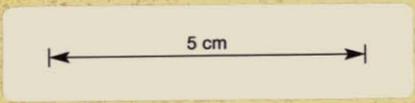


Pb %	Zn %	Ag oz/ton	143' - 148'
0.27	0.065	0.1	
0.66	1.12	0.3	
0.99	1.02	0.2	

Pb %	Zn %	Ag oz/ton	220.9 - 224.9
0.46	0.015	0.10	
3.19	0.545	0.40	230.9 - 232
25.8	19.6	2.50	
0.7	19.5	0.20	
9.5	26.2	0.10	

*Pb assays agree
neither x plan nor
with table in report!
LML 27/11/84*

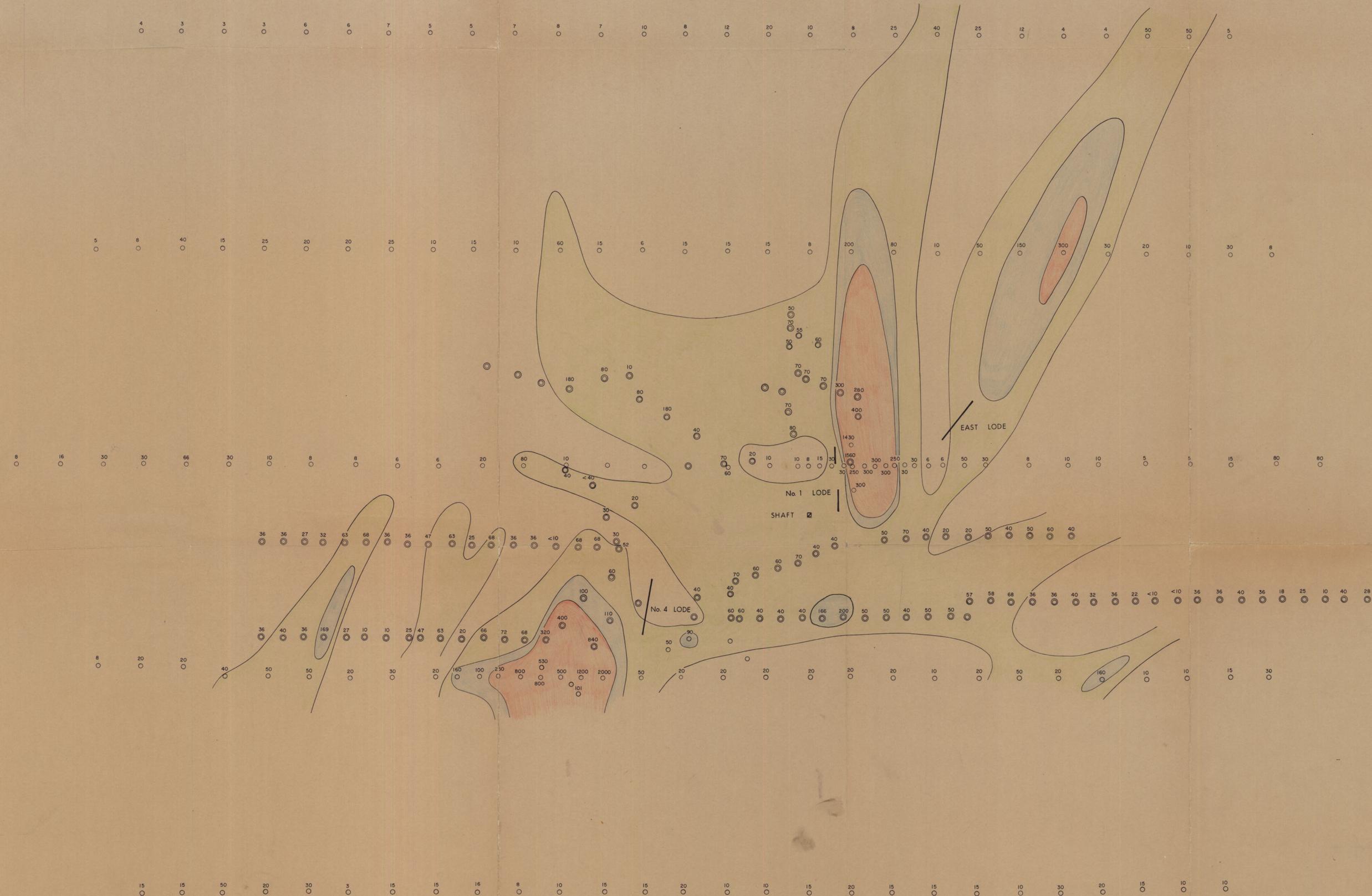
009068



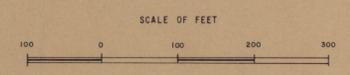
MINOPS PTY LTD
 40-631
QUEENSBERRY PROSPECT
SECTION OF D.D.H. 8
 2106
 DIP : 65°
 AZIMUTH : 085°
 TOTAL DEPTH : 248'
 STARTED : 18.4.70 FINISHED : 12.5.70

7

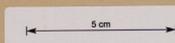
SCALE : 1 INCH = 20 FEET	GEOLOGIST : M.J. LENNOX
DATE : MAY 1970	RE-DRAWN : 9 DEC. 1970



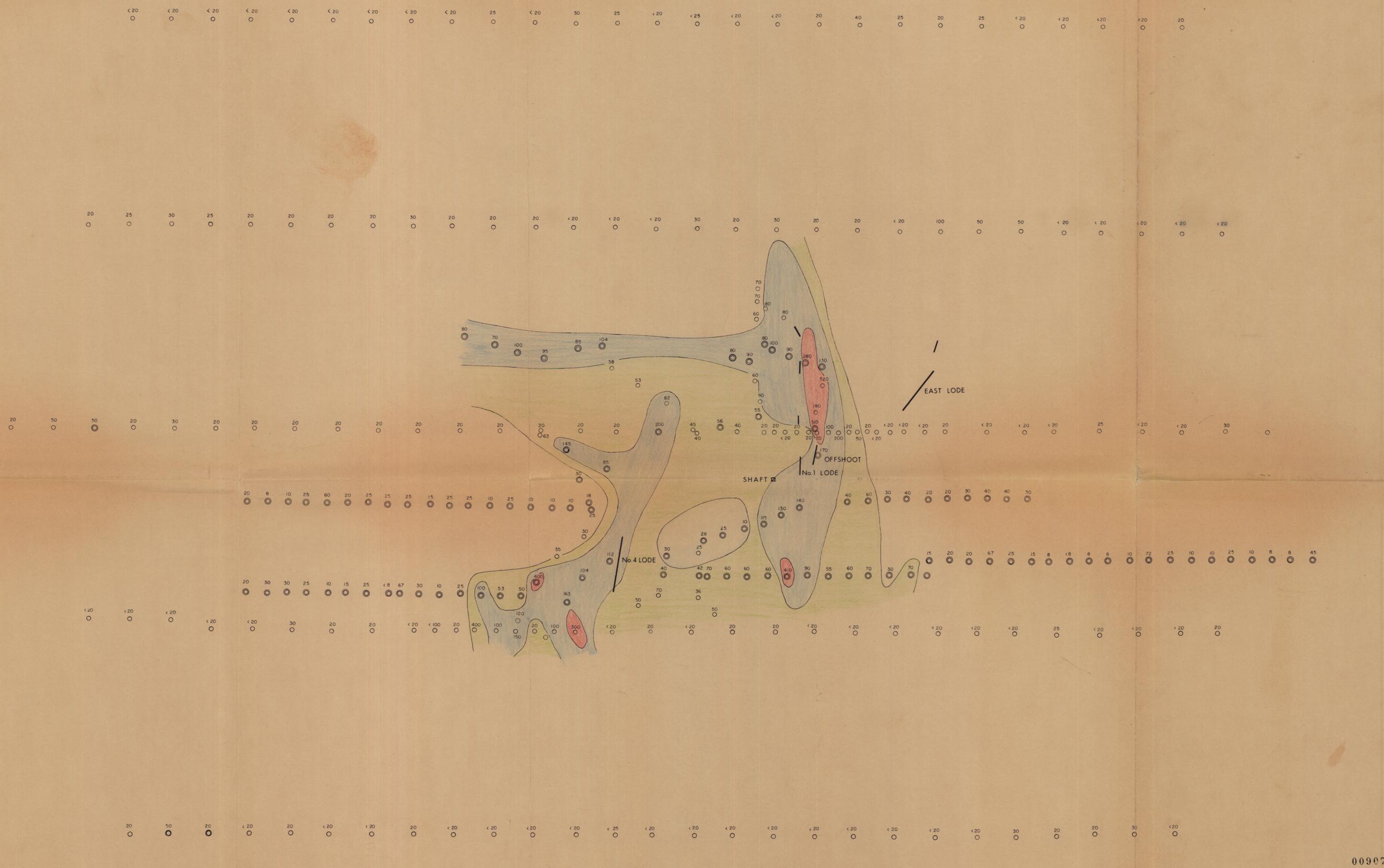
- MINOPS SAMPLE POINT
- N.C.G.A. " "
- 0 40 p.p.m.
- 40 80 p.p.m.
- 80 240 p.p.m.
- < 240



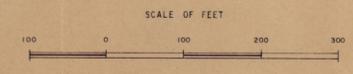
009069

MINOPS PTY LTD	
70-631	
QUEENSBERRY PROSPECT	
SOIL GEOCHEMISTRY : LEAD	
	
Date : May 1970	Redrawn : 7.12.70 C.O'Rourke
Scale : 1" = 100'	Geologist : M.J. Lennox

8
2107

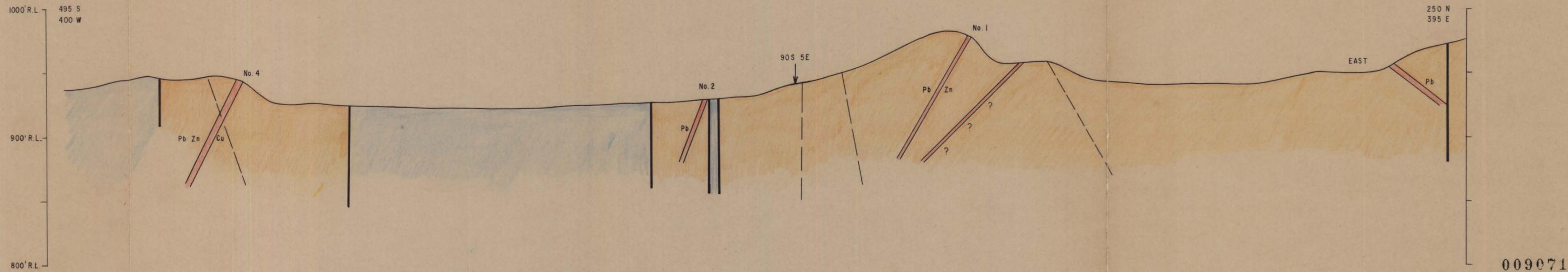


- ⊙ MINOPS SAMPLE POINT
- NCGA " "
- 0 40 ppm
- 40 80 ppm
- 80 240 ppm
- < 240 ppm

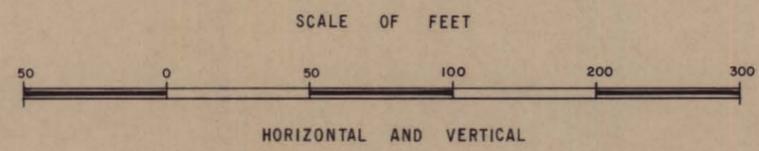
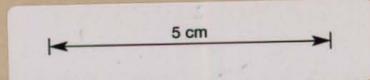


009070

MINOPS PTY LTD	
70-631	
QUEENSBERRY PROSPECT	
SOIL GEOCHEMISTRY : ZINC	
2108 9	
Date : May 1970	Redrawn : 7 Dec 1970 S.Nolan
Scale : 1" = 100'	Geologist : M.J.Lennox



009071



- Pyroclastics
- Black Slate
- Fault
- Fault Inferred
- Bedding form lines
- Lodes

MINOPS PTY LTD

70-631.

QUEENSBERRY PROSPECT
SECTION THROUGH ALL LODES

2109 10

SCALE : 1 INCH = 50 FEET GEOLOGIST : M.J. LENNOX
DATE : MAY 1970 RE - DRAWN : 8.12.70 S. Notari