

Old Mines on Zeehan Lodes

Zeehan - Queen

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① Location and Access.

This mine is situated on the Trial Harbour Road in what is known as the Queen Valley. It is 40 chains beyond the Corinna - Trial Harbour Road junction. Its distance via Main Street from the Zeehan Station is thus $2\frac{1}{2}$ miles.

It is easily accessible from the Trial Harbour Road, both No 2 and No 4 shafts being right alongside the road.

② History.

Originally forming portion of the Silver Queen Prospecting Association holdings, this mine was one of the very first producers at Zeehan. In 1902, however, it was refloated as the Zeehan - Queen, the other seven sections being sold to the Zeehan - Montana Company. The lease retained was 1638 - 87M and this was worked ^{in a disastrous manner} until about 1908 when it closed down and has never been reopened.

In 1893 Montgomery records the No 2 shaft as down to 155 feet with levels at 115 ft and 155 ft. In 1903 Waller records levels at 80 ft, 157 ft and 224 ft. He also records two levels at the No 4 shaft at 110 ft and 210 feet with the shaft down to 230 ft. The Zeehan - Queen Coy sank no further in either shaft.

Waller is critical of the mining methods used:-

"The lode appears to have been worked in a most extravagant manner" ①

←+++++ The manager of the Zeehan - Queen was T. Vincent Jnr, son of the old - timer Cousin Jack T. Vincent of the Spray. T. Vincent Jnr was far from efficient, very erratic and quite unreliable.

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Then the subscribers restarted the mine with No 4 lode and enabled the directors to boom the shares with £34,000 in dividends, leaving no capital for further dead work. The buyers fell in again, and the mine had to be sold to its present foreign owners."

During this period there were frequent stormy meetings of shareholders, but the rot went on. It is interesting to name the directors: - C. E. Featherstone (Chairman), Leo Susman, W. Murdoch, Alfred J. Taylor, Henry Conway and T. Bradley. It is intriguing to note that Alfred J. Taylor was Hobart Public Librarian and that the Hobart Library possesses no copies whatever of the Tecton & Dundas Herald, which reputedly attacked the directors.

The affairs of the Silver Queen Prospecting Association were badly conducted. Capitalisation was 21,600 shares of 12/- each. After the usual issue of well over 50% of these to the vendors and the customary cash ^{hand} -outs, not much more than £1000 was available as cash to operate on. On Nov 12th 1903 the T & D Herald gives these details of events: -

* The Silver Queen started with a few hundreds capital and kept the mine going by advances from stockkeepers etc, till the rich gossan of No 2 was struck. The directors declared £8,000 in dividends, the last out of reserve funds, and boomed the shares to £8. At this figure the buyers fell in and the bottom of the mine fell out, bringing the shares to 6 and the shareholders to a call-paying stage.

(2)

③ Output and Profit.

The total output has been 20,000 tons of galena

The original Silver Queen Prospecting ^{Association} paid dividends in the 1890's ^{amounting to \$42,000} but drifted into financial distress and sold its No 1 Mine (now Montana No 2). In 1902 the Association sold out to a ^{group} who ^{located it as the Zectan-Queen and this} resulted in the yield of 13,000 tons of galena. In the early years from 1902 profits were made but the later years were on the marginal ^{line} and in the end ^{the mine} was run at a loss. Having reached that stage it soon closed down.

④ Geologic Environment

① Country Rocks.

No 2 Shaft was sunk very close to the boundary between the Melaphyre formation and the Nubeena Quartzites + Slates. The former dip east under the latter. As a result Clarke's lode occurs in the Nubeena Quartzites, while the remaining lodes are in the Melaphyre series.

② Position Relative to Regional Structural Pattern.

The Zectan-Queen is 7000 feet west of the Waller Fault and well to the south of the Montana-Oonah slides. As far as recent mapping is concerned, no obvious fault has cropped up in the vicinity of this mine. However, Waller in 1903 claimed that No 4 Lode North is within a cross fault or slide. He says:-

"No 4 Lode North has an average strike of 42° west of north, and dips to the north-east at an angle of 45° . It is a well-defined fissure formation, and I take it to belong to a series of parallel lodes, or, as I have termed them above, cross-lodes, which traverse the northern portion of the Zectan field, and which appear to mark the main direction of faulting in this part of the field." (2)

The boundary between these two rock formations as shown in the composite map accompanying this report is partly surveyed and partly sketched. The northern portion was mapped by Dr. Prider & B. Webb, the southern portion is only sketched.

The relationship of No. 4 Lode South to the rock formations is interesting. ^{Mace's} Mace's Adit was driven along this lode and the lode petered out as it neared the boundary of the Nabena Quartzites & Slates. The South Adit was put in at a higher level to crosscut for the southern continuation of No. 4 Lode South and Clark's Lode. Neither lode was found. No. 4 Lode South was not there because the whole of the country passed through except for the first 100 feet was the Nabena Quartzites & Slates. Clark's Lode was not found because it does not pass southwards of the Tear fault in which No. 4 Lode North has been deposited and which had better be named the Queen Tear Fault.

As depicted on the mine plan, the course of this fracture resembles that of No 4 lode in the Western mine which occupies the Montana No 1 Slide. Its course is not quite as regular but conforms to the general character of a dead fault. Waller saw it underground and his opinion must be treated with respect.

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Recent recognition of approximately east-west folds in the Cambrian rocks enter the picture of the position of the Zectan-Queen workings. But these interpretations are at present too obscure to be the basis of any consideration of the structure — or deposition relationship.

⑤ The Lodes

① Number and Spacing.

In all there have been seven lodes worked. There are Clark's, Nos ^{Magazine, North, 4 South} 2, 3, 4, & 5 lodes. They occur within a width of 1500 feet measured east-west at the Main Shaft. But, because of the No 4 lode ^{North} striking 320° in contrast to Clark's lode at 30° and No 3 lode at 350°, relative proximity varies. Thus in the south-eastern section of the workings Clark's lode & No 4 lode ^{North} are only 200 feet apart.

② Proved length and width.

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3 feet wide.

No 4 lode ^{North} has been driven on for 700 feet at three levels. The width was from 4 to 5 feet. At the No 2 (210 ft) Clark's lode has been driven on for 900 feet at two levels. At the lowest level (No 2 at 210 ft) it has only been driven on for 60 feet. The width is from 4 to 5 feet. Waller

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No 4 lode South has been driven on for 350 feet at No 1 lode and for 270 feet at No 2 lode. The width averaged well over 5 feet and is described by Waller as "a large pyritic lode".

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t in length.

No 2 lode has been driven on from No 2 Shaft at three levels — 115 ft, 157 ft and 224 ft — for 450 feet, 470 feet and 240 feet respectively. No precise information is available as to width in the lower levels, but in the surface workings it was 6 to 8 feet wide.

No 3 lode has been worked from No 3 Shaft at two levels, ^{at one level from No 2 Shaft and at one level from No 4 Shaft} lengths driven are 480 ft, 540 ft, 390 ft and 210 ft. The width is not stated by Waller but would seem to have been the general 5 to 6 feet.

The south-eastern portion of this fracture passes just south of the southern limit of workings on Clarke's lode. ← The medial portion received the No. 4 lode south as it comes north and in a manner typical of the tension crack lode - tear fault relationship carried good ore near the junction.

Where is the eastern continuation of this tear fault on the Queen Hill and the Argent Flat?

a branch of the lode was followed for about 200 feet when a cross-cut east was put out to cut the main portion which was found at 50 feet. This branch is described by Waller as being a good-looking formation 3 feet wide. ←

in his 1903 Map shows Clarke's lode as 2500 feet in length, ← making it cross the Trial Harbour Road about 600 feet west of the end of Main Street. He actually shows it as an unbroken line which must indicate that he had definite evidence of it. In the map accompanying this report Clarke's lode is shown as solid as far as drawn on, but with a broken line extending it ^{shown by Waller} for part of that.

Magazine lode was worked from No. 2 Shaft. It lies to the east of No. 2 and the workings on it are south of the shaft. The drive at No. 1 level on this lode is 480 feet in length. ←

No 5 Lode was cut in the east crosscut at the bottom level from No 2 Shaft (224 ft). It was driven on for 100 feet, but was pronounced unpayable, although near the surface tributaries did very well on it.

© Orientation.

Nos 2 and Clarke's Lodes strike east of north — 60° and 30° respectively. The former is nearly vertical, while the latter dips easterly at 60° .

No 4 Lode South also strikes east of north — 15° . It dips easterly in an undulatory manner, the angle ranging from 20° to 45° .

No 4 Lode North strikes 318° and dips easterly at 45° . Both Nos 3 + 5 Lodes strike about 350° and dip eastwards at steep angles.

⑥ The Ore.

① Character of Lode Material.

In this group of lodes of the Zectan-Queen we have a variation of the typical Zectan siderite lodes. Quartz comes definitely into the mineralogic picture. In addition there is the presence of stannite in Clarke's lode ^{as well as} ~~in addition to~~ galena.

It is unfortunate that neither Waller or Tvedtrees and Ward devote any attention to the mineralogy of the Zectan-Queen lodes, since an examination of the dumps shows that there is a marked variation from the normal. The only scope at the present juncture is limited to general comments on the lodes as a whole.

The lode material is fissure filling. On the dump of No 3 Shaft solid masses of quartz can be seen with veins & bunches of sphalerite. On the dumps from Clarke's lode variations from solid quartz to solid pyrite occur. The quartz in both cases is vein quartz and the pyrite crystalline granular.

② Constituent Minerals.

Galena, stannite, sphalerite and pyrite are the sulphide minerals, with chalcopyrite in the stannite lode. Quartz and siderite are the gangue minerals with

the former dominating in Clark's and No 3 lodes. In the other lodes siderite is in the ascendancy.

© Concentrations.

(i) Galena. — Solid galena was ^{common} frequent. ~~resources~~ in all the lodes worked. The \$42,000 paid in dividends was largely obtained from the runs of solid galena. The mill was only a small one and Waller drew attention to the quantity of milling ore left unmined. ~~lumps~~ ^{lumps} of solid galena up to 6 inches wide can be found in the mullock dumps. In Clark's lode the galena portion assumes the phase of solid galena, which at the 44 ft level ^{formed} a shoot 200 feet in length. But the milling ore phase is more frequent.

ation between No 4 lode North lode and 3 feet



(ii) Stannite. — This is confined to the 'stannite' section of Clark's lode. This lode is not a mixture of stannite, galena and pyrite, but consists of two portions which can be mined separately. Both carry pyrite. In the past both galena and stannite have been produced by a combination of selective mining and ^{hand-}hand-picking.

The silver ratio on the galena is 1 ounce Ag per unit of Pb. The stannite carries good silver values, bulk parcels sold averaging about 70 oz Ag per ton.

Hand-picked stannite assays:-

Cu	16%
Sn	14%
Ag	78 ozs per ton.

⑦ Mine Workings

① Adits.

There are four adits, all driven into Queen Hill. Nos 1 & 2 were driven to cut Clark's lode. No 3 was driven to cut both North lode South and Clark's lode. No 4 was driven along North lode South. The lengths are respectively 450 ft, 150 ft, 500 ft and 340 ft. They are mostly collapsed.

② Shafts.

Apart from original prospect shafts such as Mac's and Lamb & Aird's, there are three shafts. These are the

Waller gives one specific indication of the relation between solid galena and milling ore. This is in the No 4 Lode North which at its best carried 18 inches of solid galena and 3 feet of 'seconds'. (3)

(3) See Glossary of Zectan Mining Terms

The composite
No 2 level
of No 4 shaft
of 536 ft
the levels
conforming
to 500 ft

Nos 2, 3 & 4 shafts of the original Silver Queen Prospecting Association.

No 2 shaft is the most westerly. It is 230 feet deep. The collar has collapsed.

No 3 shaft is an incline shaft midway between Nos 2 and 4 shafts. It is 170 feet in depth. The collar has collapsed

No 4 shaft was that ^{from} which the Zectan-Queen Company conducted operations. It is 230 feet deep. The collar is standing. On the Zectan-Queen mine plan it is shown as No 1 shaft. ^{A wing was sunk from the 210 ft level for 60 ft and an intermediate level opened at 20 ft.} This was renamed by the engineer T. H. Vincent.

four. That
No 4 shaft is
at lower

© Crosscuts.

There are of course the crosscuts from the respective shafts to the various lodes. No 2 shaft has three such, at the 115 ft, 157 ft and 224 ft respectively. They are short. No 3 shaft being an incline has no crosscuts, but there are ^{at 75 ft and 157 ft respectively} two levels. No 4 shaft opens out at three levels 28 ft (to connect with the old 44 ft level), 110 ft and 210 ft with short crosscuts at each.

relation
following

From the north drives on No 4 lode South there are crosscuts of about 250 feet to intersect Clark's lode at both the 110 and 210 ft levels.

No 4 shaft with
of No 2 shaft

There is a long crosscut ^{eastward} from No 2 shaft at No 3 level to cut No 3 lode. The crosscuts from No 3 shaft to cut this lode are of course much shorter.

A west crosscut was driven from the north drive on the branch of No 4 lode North to cut Nos 5 & 3 lodes. This measures 350 feet.

has been
implication
based on the

④ Drives.

Lengthy drives along lodes are a characteristic of the Zectan-Queen workings. Thus at both No 1 & No 2 levels No 4 shaft the drives on No 4 lode North & No 4 lode South, which junction, measure about 1100 feet.

of No 2 New level No

The drives from the same shaft on Clark's lode at the 44 ft and 110 ft levels are 750 feet and 1000 feet respectively, but at the 210 ft level the drive is only 75 feet.

- 2
- 1
- 3
- 3
- 3
- 5
- 4
- 6

The drives on the other lodes have already been indicated in describing the lode lengths.

The deepest drive is from the wing sunk from the 210 ft No 4 shaft in southern portion of the drive on No 4 lode South. The bottom of the wing is 100 feet below the 210 ft level, but the intermediate level was driven for 100 ft at 280 feet. at 240 ft below the collar of No 4 shaft

The level chosen for representation on the composite plan accompanying this report is No 3 i.e. No 2 level of No 2 shaft, No 2 level of No 3 shaft and No 1 level of No 4 shaft on the old terminology. This level has a mean of 536 ft above sea-level. It thus corresponds to the levels represented on all the composite plans accompanying reports of this series i.e. the level nearest to 500 ft above sea-level.

The collar of No 2 shaft is on the 703 ft contour. That of the No 3 shaft is at the same level, but No 4 shaft is on the 637 ft contour and is therefore 66 feet lower than the collar of No 2.

On the old mine plans there has been no correlation between the levels at the three shafts. The following table shows the relationship:-

Level No	Depth below Collar of Shaft			Levels of the No 4 Shaft with Depth below Collar of No 2 Shaft
	No 2	No 3	No 4	
No 1 Adit				66
1	115	75	110	176
2	157	157	210	276
3	224			276

The mine plan accompanying this report has been compiled by combining several old plans. For simplification in colouring the following naming of levels based on the above table has been adopted:-

Old level No.	Shaft No.	Depth	Depth below Collar of No 2	New level No
44 ft	4	28	94	2
1	2	115	115	2
1	3	75	75	1
1	4	110	176	3
2	2	157	157	3
2	3	157	157	3
2	4	210	276	5
3	2	224	224	4
Winge	4	260	326	6

Nos 2, 3 & 4 Shafts Association.

No 2 shaft is the collar has collapsed

No 3 shaft is an 4 shafts. It is 170 ft

No 4 shaft was conducted operation

standing. On the 2nd No 1 shaft. This is

crosscuts.

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Drives.

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No 4 shaft the drives junction, measure at

The drives from 44 ft and 110 ft level

but at the 210 ft level the

(7)

⑧ Discussion of Possibilities

① Available Ore.

There seems to be no doubt that there exists in the Zectan-Queen workings a considerable quantity of ore of milling grade. Waller in 1904 said:-

"The No 4 Lode South has been stoped out from an intermediate level, 50 feet below No 2 level, up to the surface. Below the intermediate level a winze was sunk 50 feet, but bottomed on iron pyrites. The lode appears to have been worked in an extravagant manner. Some of the old stopes are still accessible, and several patches of good second-class ore are still standing, which would have paid well to take out, if the lode had been mined systematically. As it is, they will now probably never pay to mine." ④

In referring to Clark's Lode the same authority said:-

"The ore is not massive, and is of low grade, and mixed with pyrites. It would pay to stope if a good mill were available for treating the ore" ⑤

A reminder is called for here as to Zectan terminology—'massive' means solid galena, 'low-grade' means below 10g Ag per unit of Pb.

'Payable seconds' were left in No 3 Lode above the 224 ft level. This lode carries appreciable sphalerite in the quartz gangue and this ore was avoided.

② Lateral Development.

The continuation of the 276 ft level from No 3 Lode to No 2 Lode would test the latter lode 52 feet deeper than the lowest workings on it at present.

No 5 Lode remains to be properly explored from the 157 ft level down to the 276 ft level.

No 4 Lode North was never adequately explored at the 276 ft level. The north branch was not followed for more than a few feet.

Clark's Lode was only driven on for 60 feet at the 276 ft

④ G. A. Waller 1904 p 62.

⑤ G. A. Waller 1904 p 62.

level. At the level above, the lode has been driven on 800 feet further north. There is thus this scope for exploration at the 276 ft level.

The Magazine lode was only worked at the 157 ft level at a late stage of the working of the mine. It is available for exploration down to the 276 ft level by crosscutting from the No 3 lode.

← ^{***} (c) Depth Development.

The lowest level reached was in the wing towards the south end of No 4 lode South at 326 ft below the collar of No 2 Shaft. The only mention available as to what was encountered there is by Waller:-

"At 50 feet down bottomed on iron pyrites"

Twelve trees and Ward do not say anything about this. But it is possible that they took cognisance of it in elaborating their extraordinary 'pyritic zone'. Many would theory the only significance of iron sulphide is its occurrence as pyrite or pyrrhotite. The 100 feet driven in this lode at the deepest point although it shows pyrite proves nothing as to what further driving or additional sinking will disclose. It is certainly not a case of 'the lode turning to barren siderite in depth'. Here is an established variation from a widely-held view of the Zechan lodes. It shows how little the behaviour of the lodes was studied.

The Zechan-Queen presents seven lodes demanding depth testing. It would seem that this could be best accomplished by diamond-drilling from the appropriate levels underground. However, whenever this is undertaken it must be realised that a considerable number of holes are essential for adequate demonstration.

(9) Recommendations

The Zechan-Queen must be unwatered before it could be claimed that the Zechan field had been really tested. Such unwatering would not be a major task. Unwatering at No 4 Shaft would drain all the workings down to 276 feet below the collar of No 2 Shaft. Stored water would be that entailed by the existence of approximately 10,000 feet of drives, crosscuts etc. The

(6) Loc. cit., p 62.

fault was never
as that the No 4
the only mentions
high grade at
No 5 lode
has been continuation
at 276 ft level
by driving
only along the

The significance of the 'slide' or tear fault was never recognised. Waller's reference only states that the No 4 Lode North occupies such a fracture. He only mentions in passing that the No 4 Lode South was high grade at the junction. One wonders what happens to No 5 Lode northwards as it approaches the north-western continuation of the tear-fault. This could be tested ^{at the 276 ft level} by driving northwards along No 5 Lode or north-westwardly along the fault itself.

level. At the level 800 feet further exploration at

The Magazine late stage of the work down to the 276 ft
← ^{xxxx} © Depth Dev

The low the south end of No 2 Shaft. The one there is by Waller

"At

Twelve trees as it is possible that their extraordinary only significance of pyrite or pyrrho. The deepest point as to what further disclose. It is certainly barren siderite in from a widely - he little the behavior

The Zechar - depth testing. I accomplished by underground. For be realised that essential for a def

⑨ Recommend

The Zechar it could be clearly really tested. So major task. The the workings down stored water was approximately 10,000

⑥ Loc. cit., p 62.

(9)

rate of flow when working was 20,000 gals per hour. Most of the ore extracted was as solid galena. The volume of milled ore extracted is represented by the tailings dump which contain 5500 tons. It is doubtful whether much filling was done.

When unwatered, systematic diamond-drilling for depth continuation could be carried out simultaneously with drawing on ~~the~~ Clark's lode at the 276 ft level and crosscutting to No 2 lode at the same level to tap both that lode and the Magazine lode. Simultaneously the old workings could be examined for milling ore left unstoped.

Cloppus Mills
18th October 1949.