

MONTANA WESTERN EXTENDED SILVER-LEAD MINE(LATE MAY QUEEN) - ZEEHANIntroduction:

Montana Western Extended mine is situated 2½ miles North-West of Zeehan and is located on the western side of the constructed portion of Zeehan-Corinna road, by which access is gained from the former township.

In June 1936, a Geological Report on May Queen Area was furnished by the writer which embraced the area now leased to Montana Western Extended Silver-Lead No Liability. Three mineral leases of 40 acres each were acquired by that Company in 1937, which has since carried out further development and mining works on the southern section (11789/M).

Geology:

Bedrock in the area consists of black slates and dark grey quartzites of Lower Palaeozoic age, in which the lodes of the district occur. In the vicinity of the lodes these rocks are folded, faulted and crushed. Away from the lodes, where observed, the bedding planes strike slightly west of north and dip at high angles to the east.

To the east and west of the mine the slates and quartzites are unconformably overlain to varying depths by glacial tillite of Permo-Carboniferous age.

Mining Works:

The mine openings undertaken by Montana Western Extended Company comprise:-

- (a) From end of adit, drives follow Clarke Lode 117 feet north-easterly and 42 feet south-westerly. At western end of the latter a rise connects with No.1 Prospecting Shaft (underlay shaft sunk on Clarke Lode by the Government prospecting party in 1936). The collar of this shaft is 49 feet above adit level.
- (b) No.1 North Drive leaves Main Adit at 173 feet from portal and has been driven a distance of 29 feet on a small western lode.
- (2) No.2 Prospecting Shaft, sunk 42 feet vertically, situated 190 feet north-east of No.1 Prospecting Shaft and approximately the same level at collar.
  - (a) A south-westerly drive from bottom of shaft, driven 42 feet partly along Clarke Lode.
- (3) Main Shaft sunk to a depth of 100 feet and being an enlargement of old May Queen Shaft. Located 464 feet north-easterly from door of Main Adit and 6 feet higher at collar.

- (a) East Cross-cut, 87 feet, and No.1 West Cross-cut, 120 feet from Main Shaft at 100 feet level.
- (b) South Drive on Clarke Lode extending 478 feet south-westerly from No.1 West Cross-cut, at 18 feet from Main Shaft.
- (c) Short drive on branch lode from South Drive at 102 feet from No.1 West Cross-cut.
- (d) No.2 West Cross-cut, 94 feet in length, commencing at 261 feet along South Drive from No.1 West Cross-cut.
- (e) Drive (21 feet) north-easterly from 41 feet along No.2 West Cross-cut.
- (f) Rise, 94 feet on Clarke Lode, situated 343 feet along South Drive from No.1 West Cross-cut.
- (g) No.3 West Cross-cut, 43 feet in length, commencing from South-Drive at 369 feet from No.1 West Crosscut.

The Lodes:

The lodes represent infilling and replacement of crushed zones in slates and quartzites on either side of irregular, north-east trending, lines of pre-mineral faulting.

The fault planes are evidently the main channels along which the mineral solutions passed before spreading into the crushed zones and depositing their mineral content. They are generally well defined and occur as smooth planes with erratic strike, and varying angles of dip to the east.

The lateral boundaries of the lodes occurring in the crushed zones are ill defined, there being no well determined walls except that the main fault planes commonly coincide with hanging walls of lodes. The latter is not general, however, since lode matter and ore are found in places on hanging wall side of fault planes. Outside the ore-shoots the lodes generally consist of veinlets, bunches and blebs of quartz with small amounts of carbonate of iron and splashes of galena, sphalerite and pyrite.

1. Clarke Lode:

This is the only lode opened up to any extent in the mine. It has been developed in the drives from end of main adit, No.2 Prospecting Shaft, Eastern Adit and in South Drive at 100 feet level from Main Shaft. The strike coincides with that of the main line of faulting along which it dips to the east at angles varying from 45°, towards northern end of workings, and from 75° to almost vertical in the south.

Width of lode varies from a maximum of 12 feet in the south drive off Main Adit to two feet in portion of South Drive at Main Shaft level, but the average width is probably in the vicinity of three feet.

(a) Ore-Shoots:

Two ore-shoots have been proved to occur in Clarke Lode. The first was developed in the drives from Main Adit along which it extended for about 100 feet. from south-west end to the northern side of winze. This ore-shoot has not yet been

proved to continue down to Main Shaft level although a little galena is distributed in the lode channel between the two levels.

The mineral of economic importance in the ore is essentially galena, containing high silver values. It occurs with a small amount of sphalerite, together with quartz and occasionally some siderite, as gangue minerals. The galena is distributed in an erratic manner in the ore shoot and is usually present in the form of lenses, bunches, veins and splashes, mainly along the hanging wall side. In numerous places a brecciated form is assumed by galena and quartz where it represents a replacement of the shattered fault zone.

Some large blocks of almost clean galena occurred, up to three feet in width, along maximum lengths of 10 feet, but the greater part of first class ore was mixed with milling ore.

Nineteen tons of first class ore were obtained in driving the level and 119 tons from the leading stope. Of the milling ore, 80 tons were freighted to Mt. Farrell for concentration and the remainder stacked at surface.

The second ore-shoot is exposed in South-Drive from Main Shaft level, where it commences at 65 feet from No. 1 West Cross-cut and extends for 160 feet south-westerly.

The ore is generally similar to that in Main Adit shoot, except that it consists chiefly of milling ore through which is distributed minor quantities of first class ore. It is reported by the Mine Manager that the better class ore occurred in foot of drive and this may have some significance in indicating an improvement of ore below the level. At time of examination some first class banded ore, approximately one foot in width was being opened in southern face of South Drive. This may prove to be a new shoot of ore or a south pitching extension of the Main Adit ore-shoot.

## 2. Branch Lode:

A branch lode, exposed along 15 feet in a short drive, deviates from Clarke Lode on a bearing of 225° at 91 feet from No. 1 West Cross-cut in South Drive (100 foot level, Main Shaft).

This lode is similar in type to Clarke Lode and appears to be almost vertical. It includes a shoot, approximately three feet in width, of milling-ore containing bunches of first class ore.

In a north-easterly drive from No. 2 West cross-cut a lode, coinciding with the branch lode, is exposed along a length of 26 feet and maximum width of seven feet. A vein of milling ore in centre of lode ranges from six to eighteen inches wide.

A lode, which appears to agree in position with southern continuation of the branch lode has been cut in end of No. 3 West Cross-cut. It here occurs as small veins and bunches of quartz traversing slates and quartzites along a north-easterly trend, and is apparently vertical. A little galena is distributed in places through the formation.

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If the branch lode continues overhead, more ore less vertically, it should junction with Clarke Lode along the footwall side.

Other Lodes and Veins:

- (a) At 70 feet from Main Shaft in East Cross-cut a north-easterly trending lode was passed through. It is the type common to the locality and consists of quartz and siderite gangue minerals distributed across several feet of broken slates and quartzites. It is stated that some galena was encountered when cross-cutting but this was not visible during the present examination.
- (b) During the process of sinking Main Shaft a siliceous lode formation two feet six inches in width and containing four inch vein of galena was passed through near bottom of shaft. Owing to timbering this is not now visible, but it is said to strike north-easterly and dip to the south-east at 60°. This lode may represent an offshoot from Clarke Lode.
- (c) In South Drive, at 68 feet from No. 1 West Cross-cut, a quartz-slate formation, two feet in width, branches off Clarke Lode in an easterly direction across back of drive with an apparent dip to the north at 70°. No galena can be seen in it and the lode does not appear to pass downward into floor of drive.
- Clarke Lode ore-shoot came in contact with this formation at the junction.
- (d) A small veinlet carrying traces of galena passes to the east of South Drive at 125 feet south from No. 1 West Cross-cut.
- (e) A quartz vein formation in slates, with apparent dip to the south-east at 45° was cut in Main Adit at 172 feet from portal.

Permo-Carboniferous tillite is in contact with the lode on footwall side at this point and was laid down subsequent to the deposition of the slates and lode. Where penetrated this lode is exposed over a width of two feet and carries bunches and veinlets of fine galena. In the face of a north-easterly drive of 29 feet on the lode irregular quartz veins and bunches traverse slates over a width of several feet, but galena appears to be absent in this portion. A three inch quartz vein showing traces of galena leaves the drive and passes south-easterly across Main Adit.

CONCLUSIONS:

It is shown that three, more or less parallel, north-east trending lodes have been opened to some extent in the underground workings. Of these, Clarke Lode, is the only one of importance in the present state of development. It is a conjugate lode system having at least one branch worthy of further development.

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Two sporadic ore-shoots, 100 feet and 160 feet respectively in length, have been partly opened up in the mine. They consist chiefly of milling ore with minor quantities of first class ore, of which small tonnages only have been developed to date.

To further develop the ore-shoot exposed in South Drive and to explore the possibilities of improved ore, as indicated along floor of this drive, the deepening of Main Shaft to the 200 feet level is desirable.

Other development from 100 feet level should consist of:-

- (1) The southerly continuation of South Drive on the ore-shoot now indicated in the end.
- (2) Driving on the ore exposed in the short drive in Branch Lode, where it deviates from Glarke Lode.
- (3) Continuation of East Cross-cut and No.2 West Cross-cut with the object of cutting other possible ore bodies in those directions.

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