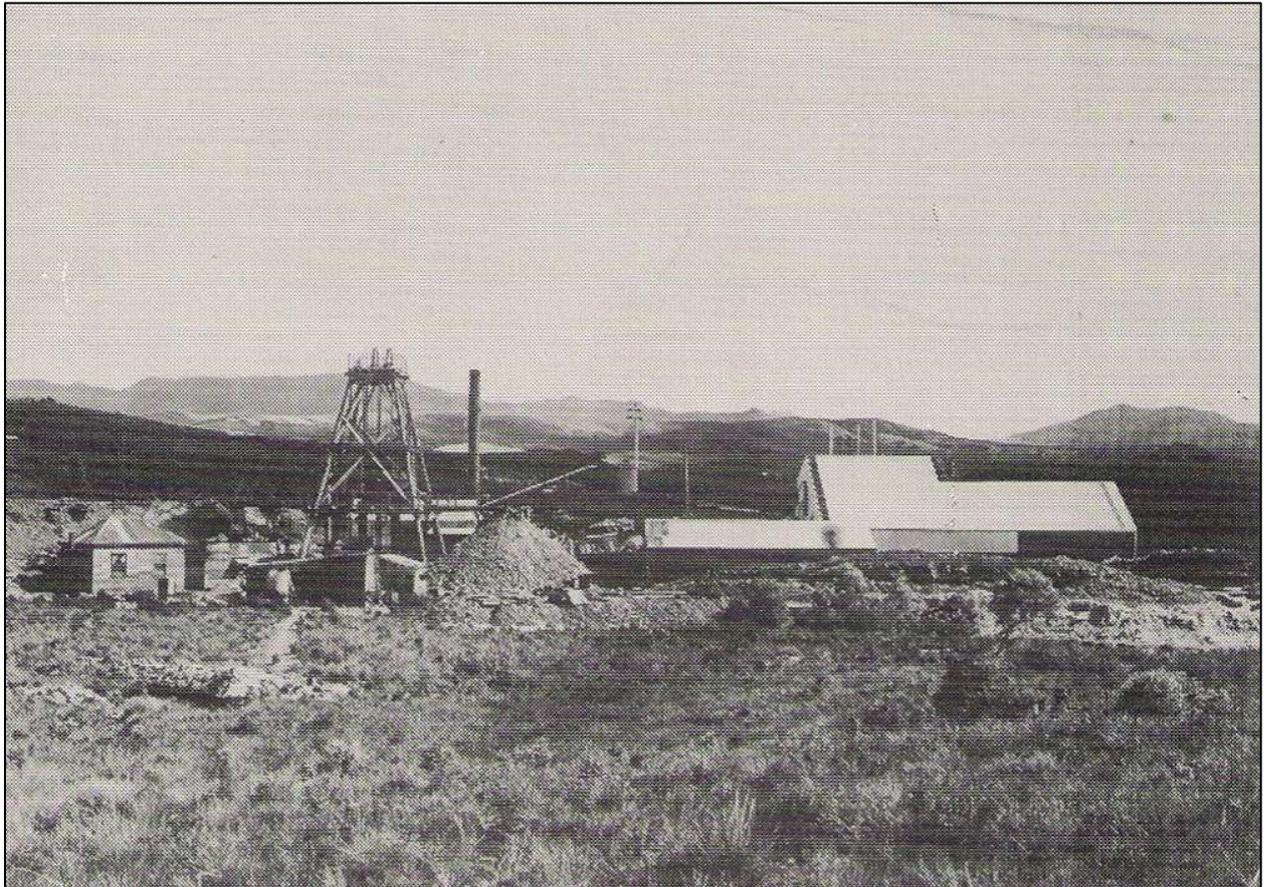


Montana Silver Lead Mine, North Zeehan, Archaeological Survey & Assessment



Prepared for Mineral Resources Tasmania

BY

Anne McConnell
[with Greg Dickens]

March 2013

Cover Images: *Montana Silver Lead Mine (main mine area), North Zeehan, c.1950s, view west. (Source – L.J. Morley, via G. Dickens)*

Acknowledgement & Disclaimer

The consultant has taken all reasonable measures to identify and review the available information on the historical heritage of the Montana Silver Lead Mine, Zeehan, and other relevant background information within the scope of the project requirements, and to provide sound advice in relation to this place within the scope of the project requirements. However there will be sources of information which were not identified, management arrangements may change, and management issues may arise which were not known or foreshadowed during this study. The consultant therefore takes no liability in the event that additional heritage or relevant background information in relation to the project is identified, or where new management arrangements or issues arise. The consultant also takes no responsibility for any shortcomings of the project report that derive from subsequent stakeholder input or changes of view in relation to the valuing, use and management of the Montana Mine. Identified study limitations are outlined in Section 1.4 of this report.

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Anne McConnell & Greg Dickens, 29/3/2013

ABBREVIATIONS**TEXT**

DPIPWE	Department Primary Industry, Parks, Water & Environment
MRT	Mineral Resources Tasmania
RNE	Register of the National Estate
TAHO	Tasmanian Archives & Heritage Office
THC	Tasmanian Heritage Council
THR	Tasmanian Heritage Register
asl	above sea level
gci	galvanised corrugated iron

MAPS / PLANS

CSA	collapsed stoped area
MEA	mineral exploration area
RA	rehabilitated area (modern rehabilitation)
T	trench
TA	tailings area (processed ore dumps)

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1 INTRODUCTION

1.1 Background to Report

This archaeological survey and assessment has been prepared for Mineral Resources Tasmania (MRT), to assist this government agency in making sound management decisions in relation to the conservation and rehabilitation of these historic mines.

The Montana Silver Lead Mine (Montana SL Mine) and three other smaller nearby mines (Big Ben, Quigleys and Barnetts Mines) were being reviewed in 2012 for Mineral Resources Tasmania in relation to their environmental and visitor safety risks. The aim of the review was to enable essential hazard remediation, primarily in relation to acid mine drainage and visitor safety, to be carried out in early 2013.

Where remediation work is planned on historic mine sites, MRT policy is to survey and document the mine site and assess the historic heritage significance of the site prior to remediation works, if this work has not already been undertaken. This data is used to guide remediation work, so that significant mines and mining heritage can be preserved where possible, and the significance retained.

The author (AM) was approached by MRT to undertake a survey, documentation and significance assessment of the Montana Mine and, if possible in the time available, the Big Ben, Quigleys and Barnetts Mines. To expedite the assessment, Greg Dickens, a former MRT employee with considerable knowledge of Tasmanian mining history and of the MRT archival resources, was engaged by MRT to undertake the historic background research.

The project has been managed by Michael Reid, Environmental Assessment Officer, MRT, who is responsible for overseeing the remediation work at the mines. The historic heritage assessment has been undertaken as a consultancy, which was commissioned in early December 2012. The history research was undertaken in December 2012 (by G. Dickens), and the field survey was undertaken in January 2013 (by A. McConnell & G. Dickens, with input from M. Reid). The report has been prepared by A. McConnell.

This report documents the Montana SL Mine only, and the other three mines are reported in a separate report (McConnell & Dickens, 2013).

1.2 Study Area

All four mines – the Montana SL Mine, Big Ben Mine, Quigleys Mine and Barnetts Mine – are West Coast mines. They were all part of the Zeehan Mineral Field and are located approximately 3-4 km north of Zeehan on the west side of the present day Zeehan-Corinna Road (refer Figure 1).

The four mine sites occur at the southeast end of a relatively flat area known as ‘Montana Flats’. This is essentially the upper catchment of Big Ben Creek, which flows north then northwest into the Pieman River. This upper catchment is drained by Big Ben Creek from the west and Barnetts Creek from the south, with only minor tributaries entering from the east. The hills rise to the south to Oonah Hill (c.440m) to the NW of Zeehan and Mt Agnew (848m) to the south west, which is part of the NW-SE trending Heemskirk Range.

The local area is one of low hills dissected by small creeks which flow west and north. The creeks flow in small narrow valleys or across wide flats (or small plains). The vegetation in the area of the four mines is essentially buttongrass heathland, but the narrow valleys contain stunted eucalypts with a

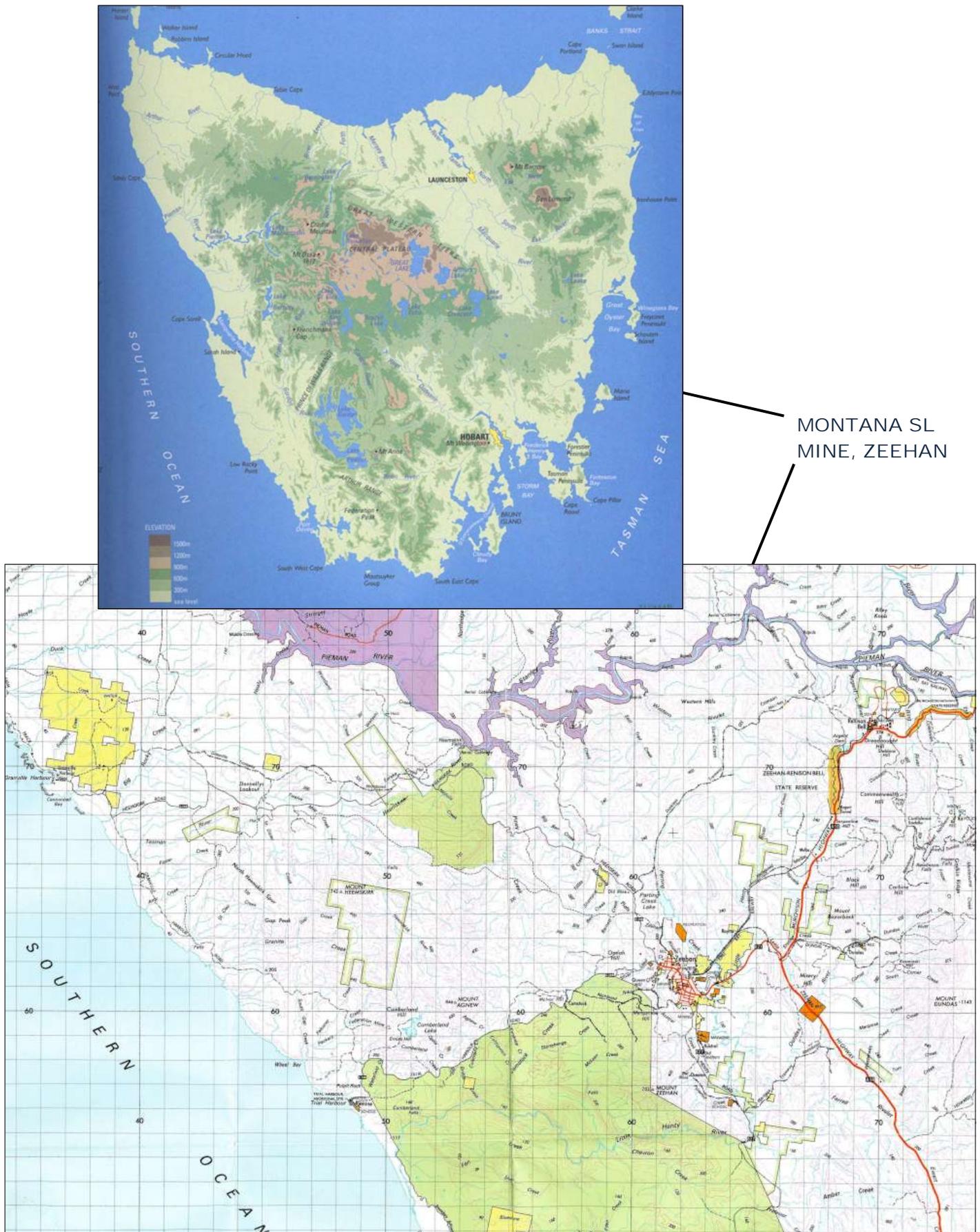


Figure 1 The general location of the assessed mines – the Montana SL Mine, Big Ben Mine, Quigleys Mine and Barnetts Mine.

[Map of Tasmania reproduced from Alexander, A. (ed) 2005, *Companion to Tasmanian History*; Map of Zeehan area taken from the Pieman 1:100,000 Tasmaph topographic map].

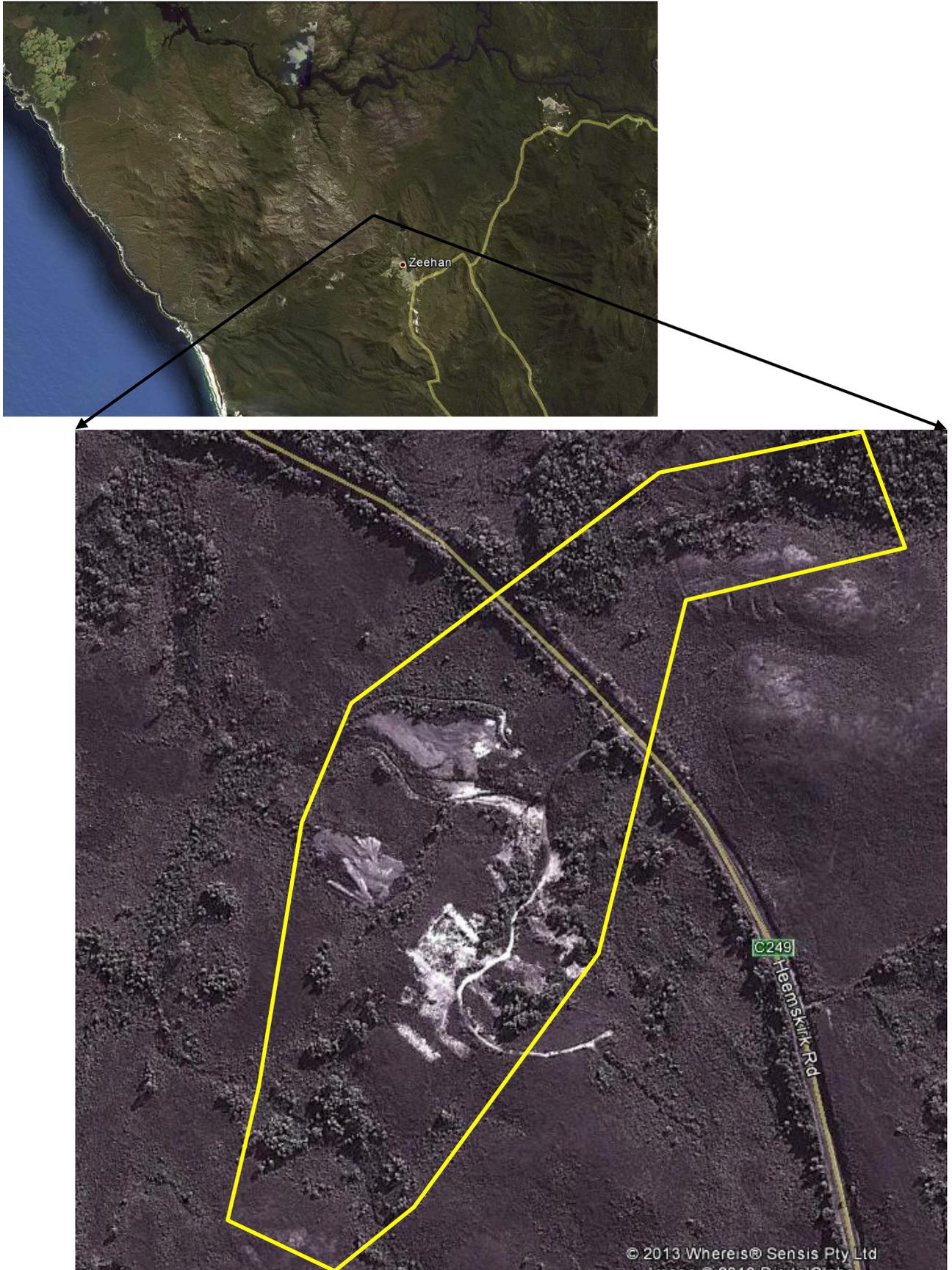


Figure 2 Location and setting of the Montana SL Mine (mine area approximately indicated by the yellow line).
[Satellite image taken from Google Earth, April 2012].

heathy understorey or wet-forest - rainforest vegetation, and there are small patches of stunted eucalypt on some rocky slopes. Thick heathy vegetation is also found along creeks and drainage lines, usually where there has been mining disturbance. Eucalypts are also found in areas of mining disturbance. The soils are shallow and there are scattered bedrock outcrops. The local relief is c.200-280m asl. The local environment is shown in Figure 2.

All four mines are located on unallocated Crown land that is managed by the Parks and Wildlife Service.

1.3 Study Aim & Scope

Aim & Objectives

The aim of this archaeological assessment is to provide sufficient information on the heritage values of the Montana SL Mine to allow MRT to make sound decisions in relation to the management of this historic mine and mine area, in particular in relation to the maintenance of historic heritage values and mine remediation and its safe presentation.

The objectives of the archaeological assessment were to provide 1. documentation of the historic mine site; 2. a significance assessment of the historic mine site; 3. advice in relation to likely remediation works, visitor safety; and 4. comment on the likely interpretative potential of the historic mine.

Scope

The study was asked to document and assess all four mines – the Montana SL Mine, Big Ben Mine, Quigleys Mine and Barnetts Mine. Essentially for timing reasons, the Montana SL Mine has been reported separately to the other three mines. This is also useful given the complexity of the Montana SL Mine compared to the other three mines, and the different history of the Montana SL Mine compared to the other three mines which have a similar history.

The consultant was asked to focus on the Montana SL Mine as this is regarded as having the most serious environmental issues, and also the greatest interpretation potential. Quigleys was seen as the next most important mine to assess, and Barnetts Mine and Big Ben Mine were only to be surveyed and documented if time permitted (M. Reid, pers comm). Four to five days were allowed for on-ground survey work, however in the end all four mine sites were able to be surveyed and documented in some detail in the time available.

The consultant was asked to assess the significance of the sites to the extent possible with the available information. Because an understanding of the history of sites is essential to assessing historical cultural heritage significance, additional historical archival research was undertaken by Greg Dickens.

Advice in relation to environmental and safety remediation and interpretative potential was required to be of a general nature and to essentially focus on highlighting key potential heritage conservation issues. The intent is that MRT will use the report to enable heritage conservation to be considered in their assessment and design of the proposed remediation and in relation to possible presentation and interpretation (M. Reid, pers comm).

The two main constraints on the scope of the archaeological assessment were 1. the field time constraints which derive from funding constraints, and 2. the need to complete the archaeological assessment reporting by March 2013 to allow the remediation work to be undertaken before winter 2013, which only allowed a relatively short period for the historical research and analysis to be undertaken prior to the fieldwork.

1.4 Study Methods

General Methodology

The general study approach reflects the standard approach to heritage assessment and conservation as set out in *The Burra Charter: The Australia ICOMOS Charter for the Conservation of Places of Cultural Significance* (Australia ICOMOS 1999), generally referred to as the 'Burra Charter Process' (refer Figure 3). As can be seen from Figure 3, this heritage assessment encompasses steps 2 to 5 of the Burra Charter Process. *The Burra Charter* is currently the main guidelines for cultural heritage practice in Australia.

The work has also been performed to at least the required standards for cultural heritage conservation in Tasmania and in accordance with *The Burra Charter* and other guidelines and policy as relevant. Constraints on, and limitations of, the survey and assessment are noted in Section 1.5.

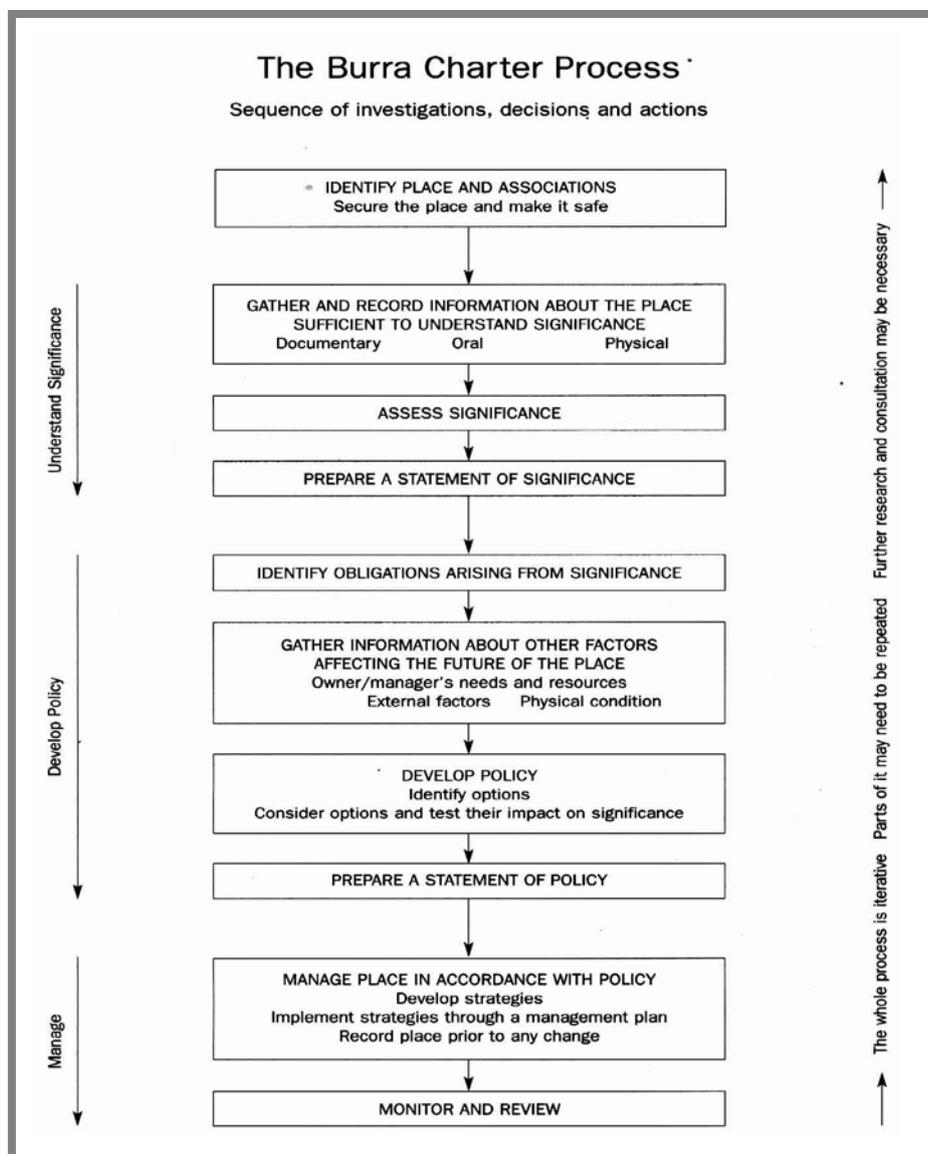


Figure 3 Australia ICOMOS (1999) *Burra Charter Process*.

Task Description

The following outlines the methods used for the different tasks undertaken in the preparation of the archaeological survey and assessment.

Historical Background Research

As small-medium mines, little historical information is to be expected for the Montana SL Mine and the other three mines. The focus of the historic research was therefore on the MRT resources. The published and archival resources of MRT were reviewed for information (reports and maps/plans) for all four mines.

A small number of secondary sources, including published books, journals and unpublished reports, have also been used. Little information on the four mines is available through these sources, but they do provided some useful contextual information. A small number of images (of the Montana Mine only) were also sourced from newspapers and private collections known to, or held by, the authors.

The historic background research was undertaken by Greg Dickens, mainly in December 2012. The historical information was then passed to A. McConnell for analysis, which mainly occurred post-field survey.

Heritage Background Research

No previous heritage investigation or assessment is known for the four mines.

Background heritage research was therefore limited to a review of the various government statutory heritage lists (undertaken on-line) and review of a small number of other reports on historic mines in the region¹ for contextual and comparative information.

This aspect of the background research was undertaken by A. McConnell in March 2013.

Field Survey & Site Documentation

Four full days were spent in the field surveying and documenting the four mine sites. Two and a half days were spent surveying and documenting the full Montana SL Mine site, half a day was spent surveying and documenting the Big Ben Mine, and one day was spent on surveying and documenting Quigleys and Barnetts Mines, which are only a short distance apart. No inspection was undertaken of underground workings.

The field survey and documentation was undertaken over the period 4-8th January 2013, with the fieldwork undertaken by A. McConnell and Greg Dickens.

At the Montana Mine a brief, initial field inspection was undertaken on the 4th January 2012 in the company of Michael Reid, MRT, who showed us the main part of the site and discussed the remediation and safety issues noted to that time. The rest of the time was spent surveying the main hill for historic mining features and artefacts, and recording these. The survey did not achieve 100% coverage of the full site, but it did achieve major coverage of the main hill and workings. The survey also used the historic documentation, in particular plans, to attempt to re-locate the known historic mining features.² A few areas were revisited after finding that some historical features noted on historic maps had not been located. Michael Reid visited the site from time to time over the period of field survey, and examined various key features that had been located, and discussed potential remediation work in relation to some of these features.

¹ *Other relevant studies are extremely limited.*

² *Unfortunately, a plan showing the full extent of the southern Montana workings was not located until after the field survey, and as a consequence about half the historic features in this area (those south of the creek) were not identified and documented in the field.*

Field recording included developing a sketch plan of the site based on GPS³ control points augmented by selected paced measurement of, and sightings to, major features, as well as tape measuring individual feature dimensions such as adit width and depth, and taking bearings to key features and of linear features. The mill remains were measured in detail using GPS control points and tape measured dimensions. All identified features were photographed and some general site and landscape photographs were taken. Notes were also taken on the nature and condition of key features.

The documentation prepared on the basis of the field inspection includes a scaled sketch plan of the site showing major identified historic mining features, as well as key other historical and modern features, a summary description of the mine site, a summary description of the individual features (provided as Table 1), and a photographic record of the place (provided as Appendix 3).

Stakeholder Consultation

Given the nature of the project and the close involvement of MRT's project manager, Michael Reid, no formal stakeholder consultation was deemed necessary, and none was undertaken. Client consultation included a pre-fieldwork meeting of both consultants and the Project Manager, and the Project Manager also visited the Montana SL Mine during the field survey and to inspect and discuss heritage findings, as well as the key hazards and remediation approaches.

Analysis – Cultural Significance & Management Obligations

The assessment of significance has used the standard criteria for cultural significance assessment (generally termed cultural heritage values) as per the Australia ICOMOS (1999) *Burra Charter*. The key heritage values that are considered are historical, scientific, social, aesthetic and spiritual value.

It has been difficult however to include comparative assessment as to date there has been minimal assessment of other historic mine sites of the same type, and scale. The Oceana Mine, the only other known comparative age mine to the Montana SL Mine, was briefly inspected during the field survey period to enable a comparison of these two mines. Only the main shaft and processing area of the Oceana Mine however could be inspected in the time available. To the extent possible without good comparative data, the mines have also been assessed against the 'regional' level of significance (ie, whether of local, regional, state or higher level significance).

The information used in the assessment of significance is primarily the historical and fabric information generated by the project. The mines potentially have some local social significance, but this was not assessed as this would have expanded the project considerably.

The advice for ongoing management is based on –

1. the Australia ICOMOS (1999) *Burra Charter* guidelines for the conservation of places of cultural heritage significance;
2. a review of the relevant legislative and other statutory instruments that apply to historic heritage and considered to apply, or to potentially apply; and
3. discussion with Michael Reid regarding the identified and potential environmental and safety issues for the Montana SL Mine site.

Reporting

This report constitutes the full Montana SL Mine assessment report. The report, including the site sketch plan, has been prepared by Anne McConnell. Greg Dickens and Michael Reid reviewed an initial draft of the report and comment has been included in this final report.

Sources consulted in the compilation of this report are listed in the References (Section 7).

³ A hand held Etrex summit was used for this purpose – generally with a stated accuracy of 6-5m given the open terrain. The post-field mapping suggests that the GPS points are accurate to within c.1-2m, except in the area of the North Montana workings where the narrow gully and high vegetation decreased the accuracy.

1.5 Study Limitations

Although the Heritage Report is not intended as a comprehensive report, there are some constraints and limitations that should be noted as they affect the ability of the study to provide comprehensive management related advice. These are discussed below.

1. **Historical information:** Although the project has been able to undertake research of primary sources, in particular the detailed records held by MRT, the mines are relatively small mines and there is consequently only very limited historical information available for the mines (although there is a moderate amount of information for the Montana SL Mine). There may be some additional information available through oral sources, which were not researched, but this information, if available, will only relate to the later period of use of the mines. This is not a major issue for the Montana SL Mine, but it does mean that there are aspects of the history that are not known and this in turn makes it difficult to assess the significance of some features (ie, those for which there is no or limited information).
2. **Field survey:** The field survey is believed to have located most surviving known features, except those at the southern end of the mine (south of the creek south of Adit 2) which were not known about at the time of the survey, and possibly some in the northern workings. In the surveyed areas, the survey was not a 100% systematic survey, hence additional surviving features may still occur but not have been identified through the assessment. This is not considered to affect the significance assessment, but should be taken into account in management of the site.
3. **Significance Assessment:** Because of the limited amount of archaeological survey, documentation and assessment of historic sites on the West Coast, and in Tasmania more broadly, it is difficult to make a comparative assessment for the Montana SL Mine and the other three mines. The ability to document and assess four mines of a similar type in this one project, as well as the ability to inspect the Oceana Mine, has however allowed some limited comparative comment to be made. This makes it difficult to reliably assess the significance of the four assessed mines in the regional and Tasmanian context.

In relation to social values assessment, no formal social values assessment has been undertaken. This will affect the assessment of social significance, especially given that it is probable that the Montana SL Mine and the other three mine sites have at least some local social significance. This however will not have a major impact on the advice provided in relation to rehabilitation work.
4. **Stakeholder consultation:** Other than for discussion with MRT, no stakeholder consultation has been undertaken as part of the project. This may have implications for management.⁴

⁴ *It is understood that MRT will undertake all required stakeholder consultation in relation to the rehabilitation of these mines.*

2 HISTORICAL OVERVIEW

2.1 Historical Overview

Regional Overview

The first mineral discovery in western Tasmania was the discovery of tin at Mt Bischoff in 1871. In 1872 gold was discovered on the Hellyer River, leading the *Mercury* to anticipate “a rush unprecedented in Tasmania” (Scripps 1990, 54-55). The Hellyer River find did not develop a major rush, and further mineral discoveries were relatively slow until the discovery of tin in the Heemskirk area in 1876 (Scripps 1990).

There was little interest in the central West coast area and little visitation by the European colonists prior to the mineral finds (Scripps 1990), but by 1881 (following the Mt Bischoff tin discovery in 1871) prospectors “had probed every part of the west, established major tracks from Lake St Clair and Circular Head and opened the mining fields of Bischoff, the Pieman River, Mt Heemskirk and the King River” (Binks 1988, 198).

The first mineral find in the Zeehan area was the discovery of alluvial tin in 1876 at South Heemskirk, which rapidly established the small Heemskirk Tin Field. Ongoing prospecting led to the discovery of silver-lead deposits in the Zeehan town area in 1882 which developed rapidly into the Zeehan Mineral Field, a major West Coast mineral field producing mainly silver, lead and zinc, and for some time the main focus of mining on the West Coast. The main period of mining on the Zeehan Field was 1882 to 1914, with only major mines in general continuing into the mid-1900s and beyond (MRT 89-3014, 593010).

The Zeehan Field was slow to develop as, according to Scripps (1990, 56) “many investors had got their fingers burnt over Heemskirk and were reluctant to take another risk”. By 1891 however, following a boom in the silver market, there were 159 mining leases on the Zeehan Field. Mines rapidly increased in number and production, and by 1894 the Zeehan Field had its most productive year (Scripps 1990). Mining and mineral prospecting has been the main focus of activity in the Zeehan area (McConnell 2009).

The following 1957 account provides a succinct summary of the history of the Zeehan Mineral Field –

“Zeehan (the town), in the 1890’s had an even greater boom period than Queenstown. Silver was discovered there in the 1880’s, and according to the then mining expert of the Hobart “Mercury”, the discovery of the field “bids fair to become a rival to the celebrated silver fields of the United States, Mexico, and Peru”. Rich surface ore was mined and sent by packhorse and dray to Trial Harbour, 12 miles west of Zeehan, for export to Australian and German smelters. Most of the profit from Zeehan’s early exports was lost in transport costs. The population of Zeehan rose to a peak of 8,000 in August 1897, but it was discovered that the silver lodes were shallow, and no payable ore was found below a depth of about 600 feet. By 1901, Queenstown had displaced Zeehan as the third largest town in Tasmania, and thereafter the population of Zeehan steadily declined.” (MRT UR1957/9-12)

In spite of government assistance for prospecting in the mid-1910s and again in the 1930s (and possibly continuously throughout this period), no new major discoveries were made (MRT 89-3014, 593010). By the c.1930s mining activity had largely ceased in the region except for a few large mines (McConnell 2009). Figure 4 shows the location of the historic mines of the Zeehan field.

According to MRT 89-3014, there was a resurgence of silver-lead mining on the Zeehan Field from 1947 to 1960 during which time the Montana SL and Oceana Mines were worked.⁵ The Montana SL Mine however was actively worked (ie, mining recommenced) from 1935 to c.1960, but with a period of no operations from c.1942 to c.1947 (see Section 2.2).

By the 1950s the Montana SL Mine and Oceana Mine were two of very few mines operating on the Zeehan field other than the very large mines that have continued until recently or which still operate (G. Dickens, pers comm). The MRT UR1957/9-12 report notes that in fact in the late 1950s there were only six mining companies in total producing ore on the West Coast (Mount Lyell, Electrolytic Zinc (Rosebery & Williamsford), the Renison Associated Tin companies (Renison Bell), Mount Farell (Tullah) and the Montana and Zeehan Mine companies (Zeehan)).

There was another upturn in mining in the region in the 1960s, but this led to no major developments in the Zeehan area (McConnell 2009). 1960 was effectively the end of the historical mining period on the Zeehan Field. At about this time both the Montana SL Mine and the Oceana Mine closed down.

Although the Zeehan Field can be considered to have had a short life, by West Coast standards it had a relatively long life, with many of the other, smaller fields having closed down by the mid-1880s (McConnell 2009). Silver lead ore production figures for the mines of the Zeehan Field for approximately the main period of mining (1890-1918) indicate that production ranged between 5 tons to over 66,000 tons (Montana No 1).

The total production of the Zeehan Field to the end of the historical mining period was 5.3 tons of tin, 194,816 tons of lead and 26,586.00 oz of silver (MRT 89-3014, 593010). MRT Report 61-335 indicates that the total production of the Montana SL Mine was c.565 tons, while the total production of the Oceana Mine, which ran for a similar period to the Montana Mine (both being comparatively long lived and late period mines)⁶, was considerably greater than the Montana SL Mine at 1,669 tons (or according to Howard (2006), 2,304 tons and 14,915 tons, respectively).

The mining was supported by other activities: Given the level of mining and prospecting in the area, there was clearly a need for major access routes. These were initially foot tracks, but better tracks were established from the early 1890s. The Waratah-Corinna cart road (the Corinna Track), first used in the late 1870s, was the longest track on the west coast and was completed from Waratah to Corinna in 1891 with Waratah prospectors and miners entering and exiting by boat on the Pieman River (Binks 1988) or crossing over and continuing to Trial Harbour or Zeehan along the southern continuation. There was also a major track from the Stanley River Tin Field south to Zeehan, known as the Middle Track, crossing the Pieman River just east of the Heemskirk River [in the vicinity of big Ben Creek] (Waterhouse 1914). The southern part of the Corinna Track appears to have been the main access from Zeehan to the Montana Flats mines, with the northern workings of the Montana SL Mine being accessed via the Stanley River Track (refer Figure 5 and Appendix 1).

Food was important on the mining fields and in the late 1800s the Van Diemen's Land Company used the northwest coast as a stock route from their holdings in Northwest Tasmania to supply meat to the mining fields around Zeehan (Binks 1988). The route, at least south of the Pieman Heads, was known as the 'Cattle Track' and ran southeast from the Heads to Zeehan. This appears to be the 'pack track' that ran E-W through Quigleys Mine (refer Figure 5 and Appendix 1). Timber was also needed for the mines and the associated settlements. A number of companies, JS Lee & Sons, Dunkleys, Grey, Britton, Fenton, Kaeger, Cummings and the Mackays established timber cutting and sawmilling operations in the region, which resulted in a network of tracks and tramways (Scripps 1990, 59) as well as a number of

⁵ MRT 89-3014 (p593010) comments that the Montana SL Mine was 'newly discovered' in this period. This however is incorrect, as the 1950s mining operation continued to use the May Queen Mine main shaft established in the 1890s.

⁶ None of the smaller mines in the vicinity of the Montana SL Mines are included in the production figures.

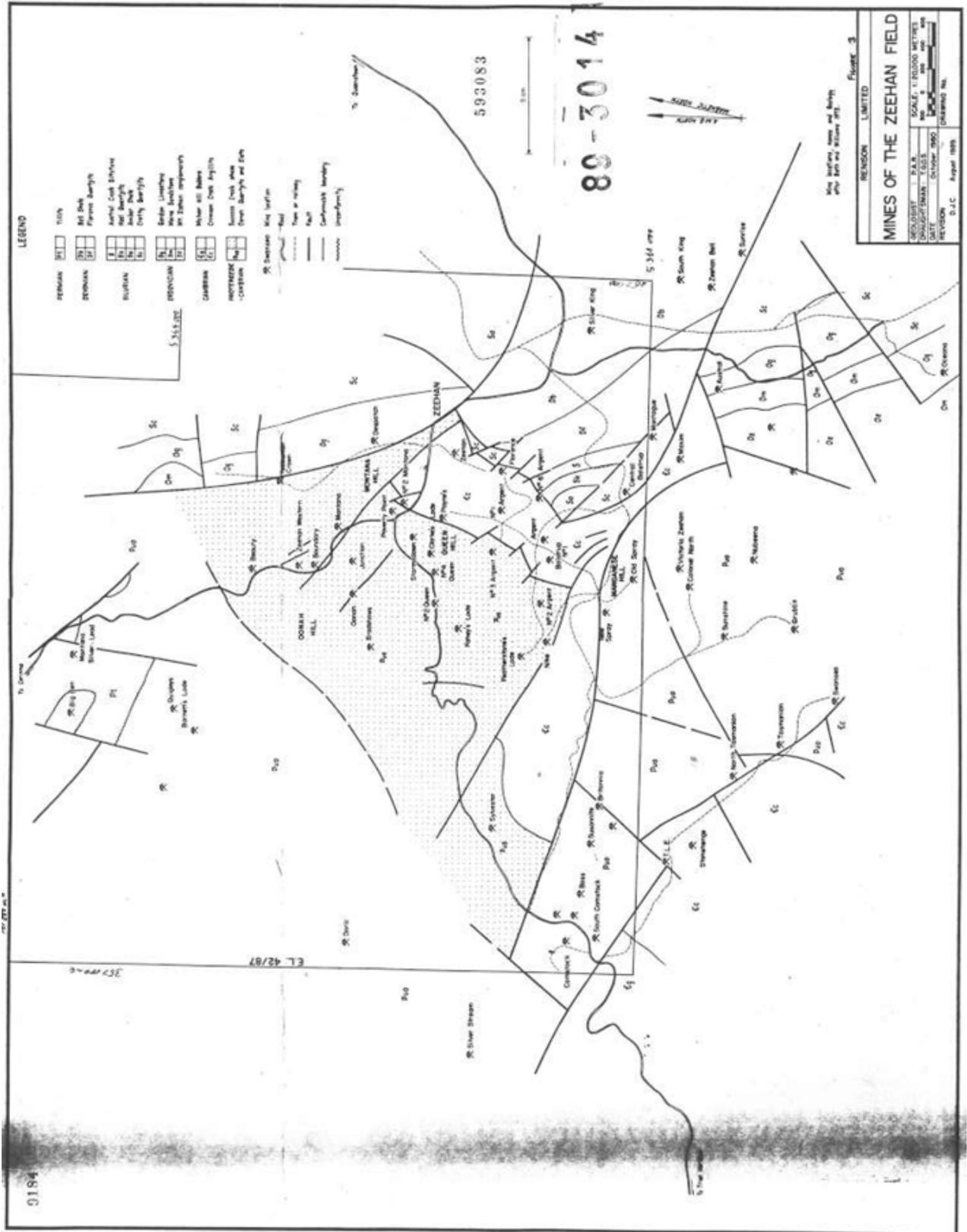


Figure 4 The historic mines of the Zeehan Field (Source – MRT 89-3014).

mills which were mainly located near the towns and/or mines. These businesses survived well into the 1900s.

The Montana SL Mine

The Montana SL Mine is located approximately four kms northwest of Zeehan in an area of low buttongrass covered hills drained by Barnetts Creek and its numerous tributaries, including Big Ben Creek. The creeks and flats also have buttongrass, with scattered clusters of eucalypts.

The topography in relation to mining prospecting has been described as follows –

“The area consists of low rounded hills bounded by the flat open valleys of small creeks running in generally westerly directions to Big Ben Creek. The topography is such that the lodes can be prospected at shallow depths (50 to 90 feet) by means of adits. Permanent mining works however, must of necessity be carried out through shafts” (MRT UR 1936/24-26, 24).

The local geology is Permo-Carboniferous tillites⁷ to the west with the mineralised zone being in Precambrian metamorphosed sediments (quartzites, sandstones, shales, siltstones and slates) that comprise the Oonah Quartzite & Slate Formation and which are sheared and faulted (Geological Survey 1962, 213).

This geological boundary appears to have been the key prospecting indicator as all of the trenches and cuts in the area are near this boundary, and most are on, or across, the boundary⁸. The underground workings closely follow this line of lode (the Clarke lode), with only a small number of crosscuts. In 1936 Blake (UR 1936/24-26, 25) observes that the lode at the surface is evident as a “siliceous capping or as quartz veinlets in a channel up to two and a half feet in width”. At depth the lode is up to 12 feet wide (UR 1936/42-46). Prospecting work in 1937-38 aimed at developing the mine reveals that although the Clarke lode remains ‘the only lode of importance’, it is in fact a ‘conjugate lode system’ with two other more or less parallel northeast trending lodes (MRT UR 1938/42-46). Further work south of the main mine area in 1952 suggests that the lode does not continue to the south in the Montana SL Mine area (UR 1952/62-64).

The mine in its later phase (and today) is known as the Montana Silver Lead Mine (Montana SL Mine), and is referred to as such in this report. The inclusion of the ‘silver –lead’ in the name is to distinguish it from the larger Montana Mines (Montana No.1 and Montana No.2) which are also on the Zeehan Field and also located on the Corinna Road, but at the south end, immediately north of the Zeehan township (MRT Deposit Details 2012). The mine is currently abandoned and has been abandoned since 1960-61.

The MRT *Deposit Details* database (2012) describes the mine as comprising “6 parallel lodes at surface, open pit, shaft and a number of adits and drives”. It further describes the locality as being on quartzites, sandstones, shales, siltstones and slates, and the commodities mined as lead, silver and zinc. The report also notes the total production of the mine as 565.254 ton.⁹ This makes it one of the smaller silver lead mines on the Zeehan Field, but in the small-medium class of mine.

Mining has occurred in the area of the Montana SL Mine since at least 1894, although it is possible some mining occurred when the original lease was taken out in 1891. Different areas of the mine have been worked at different times and under different companies and individuals, but the main focus of operations over the mine’s life appears to have been three shafts – the No1. Prospecting Shaft (an underlay Shaft), the No.2 Prospecting Shaft & the Main Shaft) and two adits –an adit crosscut (the Main Adit) and the ‘Eastern Adit’. These are all centred on a single low hill in the central part of the mine site.

⁷ *In this area the tillites are ‘mudstone conglomerates’ (MRT UR 1936.24-26).*

⁸ *This relationship is also noted by Taylor and Burger in 1952 (MRT UR 1952/62-64).*

⁹ *Note this is a significantly different figure to that given in Howard (2006), which is 2,304 tons of lead and 279,348 oz silver.*

The historical mining leases for the mine encompassed an area of some 140 acres.¹⁰ The actual mine site (ie, the area with known historical workings) is slightly less than half this area, and is in the order of 850m (N-S) x 350m (E-W).

The main companies that have operated the Montana Mine are the –

- May Queen Prospecting Association NL, 1894- 1896;
- Western Extended Silver Mines, 1896-1902;
(Western Extended North Silver Mining Co. NL, 1896-1898)
(Western Extended Silver Mining Co. NL, 1898-1900)
(Western Consolidated Silver Mines NL, 1900-1902)
- Montana Western Extended Silver Lead Co. NL, 1937-1939
- Montana Silver Lead Mining Co., 1939-1960-1.

The mine has therefore been known variously over time as the ‘May Queen Mine’, the ‘Western Extended Mine’, the ‘Western Consolidated Mine’, and the ‘Montana Silver Lead Mine’.

Mining at the Montana SL Mine was intermittent. The main mining phases however were –

- 1894-1902 – prospecting and minor mining operations; production = 27.96 tons of lead and 2563 oz of silver;
- 1935-1941 – additional prospecting and significant mining operations;
- 1947-1958 – tribute operations followed by significant mining, including establishment of a processing mill.

The following summarises the history of the mine by its key phases (and is mainly taken from UR 1951/113-221). More detailed available historical information is summarised in time line history in Appendix 1, and the individual feature histories are summarised in Section 2.2.

1894-1902 (the May Queen Prospecting Co. and Western Extended Silver Mines)

Very little, if any ore production occurred during period of the May Queen Prospecting Association lease. Most of their work was prospecting, which included 1. sinking a pit to 9’ (later developed into the main shaft of the mine) and a nearby costean (later covered in); and 2. sinking a small underlay shaft (later the No.1 Prospecting Pit) to 15’, which apparently was sunk onto ore.

UR 1951/113-221 notes that there is no record of any exploratory or developmental work being carried in the period when the Western Extended North Silver Mining Co. (1896-1898), the Western Extended Silver Mining Co. (1898-1900) and the Western Consolidated Silver Mines (1900-1902) had the leases on the site. Twelvetrees (1900) however comments that the Western Extended North Silver Mining Co. NL sank a shaft [No.1 Prospecting Shaft] to 160’, and this is also reported by Waller (1904), who notes as well that the shaft (by 1898?) has a crosscut at 160’ with stoping to the surface; and a winze sunk to about 60’ with associated stoping. Waller (1904) also notes that the Western Consolidated Co. (1900-1902) owned a concentrating mill, suggesting that this company had been actively operating the mine. Waller (1904) also notes the two main lodes as being termed Colemans lode and Morris’ lode.

Twelvetrees in 1900 did not report favourably on the mine. He commented that “the lodes of the Western are so irregular in bearing and behaviour, that the mere correspondence in strike of a lode on an adjacent section is insufficient for identification. The published assays are very variable...” and goes on to note that the lead ore must be considered secondary ore (Twelvetrees 1900, 114?). He does however provide some encouragement as he goes on to comment that “It will be gratifying if the owners can show that the Western is not the termination of the field, but that the Zeehan lodes extend further north” (Twelvetrees 1900, 114?).

¹⁰ This is based on the size of the four key leases that have comprised the mine – 11789M (40ac), 11790M (40ac), 11791M (40ac) and 101M/47 (20ac).

1902 – 1935 (minor prospecting)

Few prospecting and no mining operations appear to have occurred from around 1902 to 1935.

Known prospecting includes –

- Some surface prospecting at the mine between 1908 and 1922, including the cutting of the No.1 Costean (later filled in).
- Widening and deepening of the May Queen prospecting pit [No.1 Prospecting Pit? Old main shaft?], cutting of a costean west from this pit, and cutting of the No.2 costean by G.W.S. Clark between 1923 and 1927.
- Work by P. Jones and party (prior to 1926) in the northern area (north of the Corinna Track) which included sinking a 35' shaft and digging a trench (MRT UR 1926/217-221, 220) (this area becomes known Jones Prospect).

Access to the Montana SL Mine, at least to 1929 was by the Corinna Track (and the Granville Tramway?) with a short access track, but by 1936 is by gravel road 'to within a few chains of the workings' (UR 1929/32-34, UR 1936/24-26).

1935 -1941 (Montana Western Extended Silver Lead Co. (1937-1939) & Montana Silver Lead Mining Co. (1939-1960-1))

Between 1935 and 1937, G.W.S. Clark undertook further prospecting with government assistance.

Works undertaken by Clark at this time include –

- sinking the No. 1 Prospecting shaft (on an underlay of 60° E) to 42' (possibly done in 1923-27);
- driving an 'adit (& crosscut) from the bottom of this [Adit 2?];
- driving the eastern drive and associated adit drives;
- extension of Costean No.2; and
- cutting of all cuts on top of the hill.

In 1936, prospecting is also occurring to the north (north of the Corinna Road) in the Jones Prospect area to test the continuation of lode. This work includes –

- making a cut (Syd's Cut) and later driving an adit from 'Syd's Cut;
- driving the No.1 Edwards Adit,
- driving the No 2 Edwards Adit (MRT report 1936 (Dec)).

A government geologist report of December 1936 however suggests this long distance (ie, northern) investigation has wasted time. This report concludes that 'future attention should be confined to developing the lode in the immediate vicinity of the underlay shaft' (MRT report 1936 (Dec)), while a June 1936 report concludes that 'eventually it will become necessary to sink a vertical shaft to test the lode at depth and if proved satisfactory to act as a main outlet for the ore' (UR 1936/24-26).

These comments appear to be rapidly acted upon, with the government geologist report of November 1938 describing a new main shaft (the re-opened May Queen shaft) which has been sunk to 100', a new vertical shaft near the top of the hill (between the main shaft and underlay shaft) sunk to 42' [No. 2 Prospecting Pit], as well as a western adit ('main adit'), all prospecting the Clarke lode near the main ore body (MRT UR 1938/42-46). In late 1938, the millable ore is either being stockpiled on-site or transported to Mt Farrell for concentration (MRT UR 1938/42-46). This work is all undertaken by the Montana Western Extended Silver Lead Co. who operated the mine until 1939.

Active mining is continued by the Montana Silver Lead Mining Co. until 1941, when operations were suspended due to the low price of lead. During 1937-1941, almost all the underground workings were opened up to some extent.

A



B

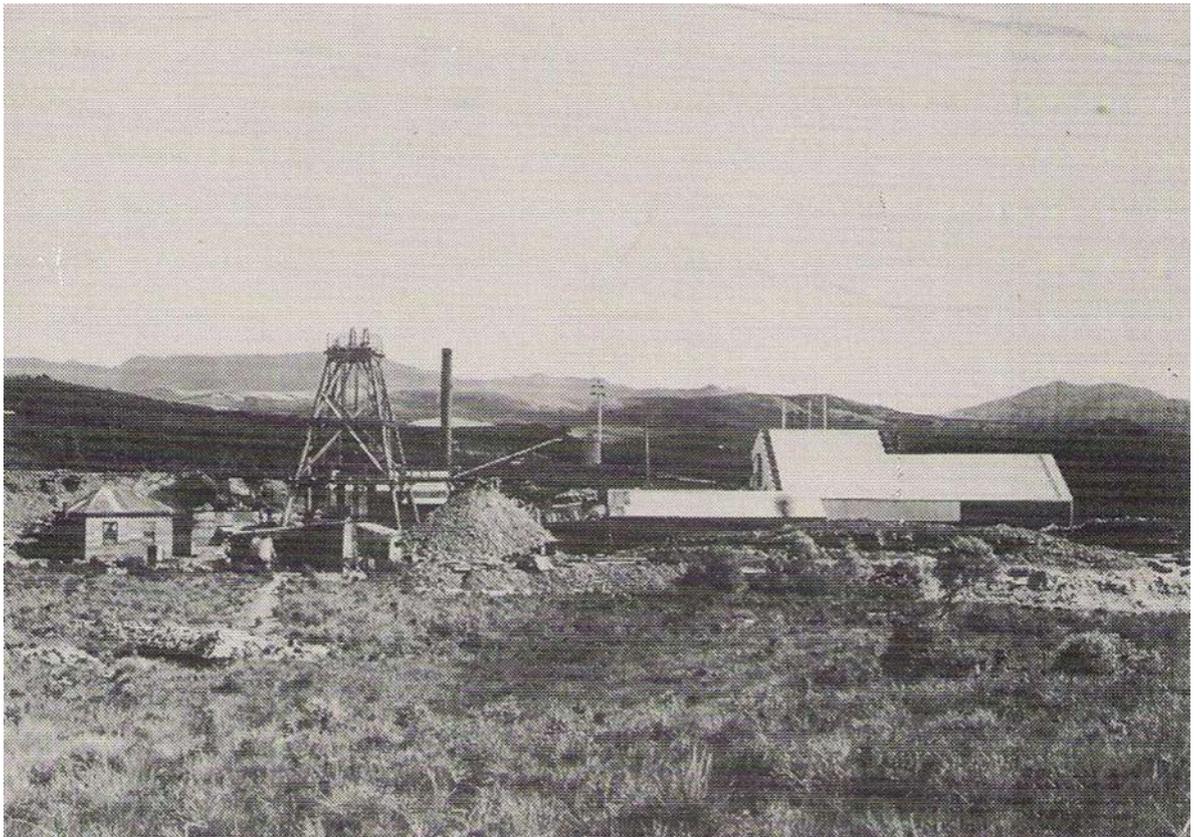


Figure 5 The Montana SL Mine, main workings: A – main workings c.1938, view west; B - main workings 1950s, view west (Source – L.J. Morley).

1941 -1947 (Montana Silver Lead Mining Co. (1939-1960-1)

No prospecting or mining appears to have occurred in this period.

1947-c.1958 (Tribute (Clarke & Brampton) (1947-1950) & Montana Silver Lead Mining Co. (1939-1960-1)

From 1947 to 1950 part of the mine is let on tribute to R.E. Clarke and T. Brampton who worked this part of the mine continuously over this period. Work appears to have been carried out in most of the main part of the mine excluding the main shaft (which appears to have too much water), and as a consequence all access was via the Main Adit.

From 1950 the Montana Silver Lead Mining Co. resume operations. The main shaft is unwatered and is the main focus of mining, with some operations still occurring in the Main Adit. The mine is productive enough to warrant the erection of a processing mill in 1951. The Montana Silver Lead Mining Co. operations continue, apparently continuously, until the mine closes in 1958 (the leases continue however to 1960 and 1961).

During 1951 -1952, the mine is inspected a number of times by government geologists who make numerous recommendations for its ongoing operation. From late 1951, after a larger engine has been ordered to drive the pump, mining appears to ramp up. This work includes creation of an 'ore pass' with first class ore being trucked through the adit to the 'old jig', and with the milling ore 'going down the ore pass to the mill', and the cleaning out of the Eastern Adit (Adit 1) and laying of rails to make a connection with the adit [Adit 2?] level drive and bringing out all ore above Main Adit level via the Eastern Adit' (MRT UR 1952/3-7).

Also, from 1947 to 1952 further prospecting was carried out in the far south of the mine area (on a separate new lease) by C.R. Richardson. This showed that while the main structural feature of the area, the tillite/Precambrian sedimentary rock faulted contact with which the ore appears to be associated, continues southwards, the nature of the contact is complex having been offset by additional faulting, and the nature of the relationship of the lode to the contact changes. It is concluded that the lode either dies out to the south or is truncated by the contact fault (MRT UR 1952/62-64).

Additional prospecting was carried out in 1954 in the north Zeehan area, including in the Montana SL Mine area. This was mainly geophysical prospecting, and was carried out by the Bureau of Mineral Resources. No new potential areas of mineralisation were located in the area of the Montana SL Mine. (MRT 89-3014, 593012) through this work.

Post Mining (post-1960-1)

Little further work is known to have taken place after the mine closed and the lease expired. The mill building and other buildings slowly decayed, and it is likely that the office and store building (and possibly other buildings or building materials) was removed for re-use elsewhere. The machinery in the mill was still in-situ in 1970, but was subsequently removed (none survives on site today).

There appears to have been limited other intervention at the site. The field evidence suggests that there has been relatively recent exploration work (drilling) across the main part of the site, and some remediation works are known to have occurred in the mid-2000s, also in the main site area (M. Reid, pers comm). Figure 6A indicates the areas disturbed by post-1961 mineral exploration and remediation works.

Based on information from MRT (M. Reid, pers comm), most of the post-1960 disturbance in the main mine area is due to a program of drilling and costeaning carried out by TNT Mines Ltd in 2008. All but one of the present day levelled areas of cleared hillslope on the main hill and to the east were proposed for costeaning and drilling by TNT Mines Ltd, and all disturbed areas are therefore likely to have resulted from this work.. The costeans appear to have been all rehabilitated (filled in and levelled), and in one case benched. This mineral exploration was widespread across the site (refer Figure 6A). It appears to have included infilling and smoothing of the area of the No.1 Prospecting Shaft (including

this underlay shaft). It is not possible to determine what historic features other than the No.1 Prospecting Shaft may have been destroyed in the area of historic workings on top of the hill by this work.

The site rehabilitation was undertaken by MRT, and is also limited to the main mine area. This work is understood to include capping of the main shaft in 1997, and the excavation of diversion drains and lime spreading during the summers of 2004-05 and 2005-06. The diversion drains are major drains (c.3' wide) and have been constructed around the north and south sides of the northern tailings area (TA 1) and also cut through the northern mullock area in the Main Shaft area. These works have been carried out, respectively, for safety reasons, to drain the significant amount seepage out of the Main Shaft away from the workings, and to reduce water flow across the tailings to avoid further loss of tailings into the local creek system (M. Reid, pers comm).¹¹

There is also a large amount of collapse on the hill crest between the Eastern Adit and the No.1 Prospecting Shaft due to the collapse of underground stoping. It is unclear when this happened, but the historical documentation suggests that the collapse mainly occurred while the mine was still in operation, and some time between 1896 and 1951 – Waller (1904, 53) notes that there is 'stopping to the surface on the two main leads' in the workings undertaken in 1896-1902, while the 1951 MRT report UR 1951/113-161 notes that at the mine there are 'breakthroughs to the surface in 3 places'. In 1989 only three collapse areas (SCA 1, 3 & 5) are still shown on the RGC Exploration P/L report map (MRT 89-3014, 593033). It is unlikely therefore that there was additional areas of collapsed stoping which have been infilled as part of the 2008 mineral exploration rehabilitation.¹²

There is no evidence for recent works in the northern and southern areas of the mine. There are however two lines of bulldozer cuts, one on each of the ridges on each side of the northern workings. These are large and wide and clearly mechanical, but partially revegetated, hence are thought to most likely be due to prospecting during the last phase of operation of the mine (ie, 1950s).

2.2 Histories of the Key Mine Features

FEATURE	DATE CONST ^N	CONSTRUCTION /CHANGE
NORTHERN WORKINGS		
Northern Shaft & etc.	1894+	<ul style="list-style-type: none"> ▪ location known as Jones Prospect (MRT Deposit Details) ▪ .c.1900-1902 – forecast (Twelvetrees (1900) ▪ pre-1926 - P. Jones and party sink a 35' shaft & also a trench 5 chns NE on the left bank of a small creek near the 'NE corner of the main Montana SL lease' [presumed to be the northern workings?] (MRT UR 1926/217-221, 220); ▪ 1936 – map showing a vertical shaft of 20', 5m S of the creek and c.35m NE of the Stanley River – Zeehan Track (MRT Plan 706-50).
Syd's Cut Adit	1936 (Dec)	<ul style="list-style-type: none"> ▪ In Dec 1936 described as - an adit driven 44' at 330° from 'Syd's Cut; ¼ chn N of the 20' shaft; developed since Jun 1936 & still being worked in Dec 1936 as ore had not been found (located in a trench to the W) (MRT 1936 (Dec) report, 58).
No.1 Edwards Adit	1936 (Dec)	<ul style="list-style-type: none"> ▪ In Dec 1936 described as - located c.3 chains NNW from Syd's cut, driven 62.5' at 68° to test a siliceous outcrop striking N-S; initially in till but contact met at 40' and the lode (only traces of ore) at 56' (MRT 1936 (Dec) report, 58).
No.2 Edwards Adit	1936 (Dec)	<ul style="list-style-type: none"> ▪ In Dec 1936 described as - located 2 chains+ SSW of No.1 Edwards Adit, driven 60' in tillite (still being worked) (MRT 1936 (Dec) report 58).

¹¹ A recent site contamination assessment has estimated that c.50% of the tailings has been washed off site (M. Reid, pers comm).

¹² This suggests that the No.1 Prospecting Shaft was intact until the 2008 mineral exploration.

Trenches	<1936	<ul style="list-style-type: none"> ▪ pre-1926 - P. Jones and party sink a 35' shaft & also a trench 5 chns to NE on the left bank of a small creek near the 'NE corner of the main Montana SL lease' (MRT UR 1926/217-221, 220); ▪ 1936 – map shows a vertical shaft 5m S of the creek and c.35m NE of the Stanley River – Zeehan Track, with – <ul style="list-style-type: none"> ▪ a short SE-NW trench c.6-7m to the SW, ▪ a NNW-SSE cut, c.25m to the N of the shaft, and ▪ a NE-SW short trench c.25m to the N of the shaft (MRT Plan 706-50).
CENTRAL (MAIN) WORKINGS		
Main Shaft (May Queen Shaft)	1894-96	<ul style="list-style-type: none"> ▪ 1894-1896 - May Queen Syndicate operating: commenced sinking a large shaft, but work ceased at 10' (MRT UR 1926/217-221, 220); 1894-1896- a '9' deep pit was sunk on site of main shaft (G. Dickens research); also (date not specified), Lease 8947M (40ac) was worked by the May Queen Syndicate, 'under the leadership of J. O'Neil, who commenced sinking a large shaft, but work ceased at 10' (MRT UR 1926/217-221, 220). ▪ 1896-1900 - a main shaft sunk to 160', a crosscut driven W from this level to cut the 2 lodes (Colemans lode cut at 50-60' then drive for 200', then risen 80' and an intermediate level driven c.100', 70' of which was stoped to the surface; Morris' lode cut in a cross cut from the intermediate (80') level and driven 80', also stoped to the surface), after this let on tribute and a winze sunk c.60' S of the stopes with ore found at 35' down (& stoped to within 15' of the surface (Waller 1904, 53) (note - Twelvetrees (1900) also notes a shaft 'initially sunk' by the Western Extended Co, to 160', rather than the May Queen Syndicate – appears to be incorrect) ▪ 1936 – apparently not active; Blake notes in conclusion that "eventually it will be necessary to sink a vertical shaft to test the lode at depth and if proved satisfactory to act as a main outlet for the ore") (MRT UR 1936/24-26, 26). ▪ Nov 1936 - a main shaft to cut the main lode at 200', and of 9' x 4', timbered with frame sets, recommended (MRT UR 1891-1969/83-84). ▪ between c.Jan 1937 & Nov 1938 – the main shaft ('being an enlargement of the old May Queen Shaft') is sunk to a depth of 110' and by Nov 1938 includes 3 drives, 3 cross cuts and 1 rise, with at least 1 cross cut at the 100' level (MRT UR 1938/42-46). ▪ between Nov 1938 & May 1937 – further working of the main shaft at least the 41' and 100' levels (MRT UR 139/18-20); ▪ 1938 – a photo of the Montana SL Mine shows a timbered head frame with mullock piles to the N and NW [similar to the N & NW present edges of historic mullock (and as shown in MRT UR 1951/113-161, site plan), 2 sheds to the W [winding engine & pump?], 2 smaller sheds to the SE [fitters shed & change rooms] and a stack of prop timber on the NW edge of the mullock (G. Dickens research); ▪ 1939-41 – mining continuous under the Montana Western Extended SL Co. and Montana SL Co. and includes enlargement of the old May Queen shaft to 12' x 4' and deepening to 297' plus the driving of the 100' level to c.510' and the driving of 1 drive, 6 crosscuts & 3 rises from the same level, additional rises, drives and crosscuts at the adit & 150' levels and the partial cutting of a plat at the 200' level; use the of shaft however stops at the end of 1939 due to water inflow (MRT UR 1951/113-161). ▪ 1947-1950 – no work at the main shaft (due to water?) although part of the mine was leased on tribute to R.E. Clarke and T. Brampton and the operation was continuous (MRT UR 1951/113-161). ▪ 1950-1951 - operations resumed by the Montana SL Co. (from Sept 1950) with operations including de-watering the lower levels; putting the main shaft back into operation; work at the adit, 100' & 150' levels; and ore from the shaft is being stacked until the mill, which is under construction in Nov 1951, is ready (MRT UR 1951/113-161). ▪ by 1951 (Jul) – described as having 'a 3 compartment shaft sunk to 297', with levels cut at 100' (97.7') and 150' (151.3') and a plat partly cut at the 220' level; considerable detail given of the actual workings off the main shaft (pp124-126) (MRT UR 1951/113-161, 123).

		<ul style="list-style-type: none"> ▪ In 1952 (Jan) – mine development and ore extraction is still occurring; a larger engine has been ordered to drive the Pomona Pump which is designed to hold the water below 300' to allow a cross cut to be made at this level (MRT UR 1952/3-7); ▪ 1950s – a photo of the Montana SL Mine shows a similar view to the 1938 image, but with the mill building completed, the mullock piles to the N and NW largely removed, mullock on the level to the rear (S) of the main shaft; 2 sheds to the W [winding engine & pump?] also with a high round brick chimney [winder and ore crusher buildings], and to the E a water pipe running from a large water tank [Water tank 1], and a long low building between the main shaft and mill [store & office] (G. Dickens research).
Main Shaft - stoping	c.1896-1902	<ul style="list-style-type: none"> ▪ c.1896-1902 – stoping to the surface on the two main leads SW of main shaft (70' and 80' long sections stoped); also stoping to within 15' of surface from winze (also 80' level? from winze) (Waller 1904, 53). ▪ By 1951 (Jul) – stoping described for the 3 levels worked – <ul style="list-style-type: none"> ▪ Adit level – 2 leading stopes taken out pre-1941; the greater part of stoping in the mine undertaken in 1947-50 (on tribute); the stoping has been carried out in an irregular manner (only good patches of ore have been taken out); there are breakthroughs to the surface in 3 places; stopes noted as being “in rather a dangerous condition at present”; ▪ 100' level – a little stoping done in the past – ‘in a few places leading stopes have been commenced but not proceeded with’; some recent stoping in the bypass drive (not being worked in Jul 1951); ▪ 150' level – has a leading stope at the S end of the S drive (timbered just prior to Jul 1951); normal stoping in operation in Jul 1951 (MRT UR 1951/113-161, 125-6).
Underlay shaft (No. 1 Prospecting Shaft)	1894-96 or 1935-7	<ul style="list-style-type: none"> ▪ 1894-1896 – during this period a 15' underlay shaft is sunk some distance south of the southern boundary of Lease 11789M (G. Dickens research); ▪ 1923-24 & 1926-27 – G.W.S. Clark widened and deepened the May Queen prospecting pit [No.1 Prospecting Pit?] (MRT UR 1951/113-161). ▪ 1935-1937 – GWS. Clark's prospecting party sink the No. 1 Prospecting shaft on an underlay of 60° E to a depth of c.42' (MRT UR 1951/113-161); ▪ being worked in 1936 (Jun) - by this time sunk to 40' on the lode; with a 17' drive NNW and a 6' cross cut at end at the 31' level, and 36' drive to the ESE at the 36' level (active in 1936) (MRT UR 1936/24-26); ▪ by 1951 (Jul) – described as ‘sunk from the crest of the hill in the vicinity of the cuts and costeans’; sunk on an underlay of 60° E to a vertical depth of 51' [deepened since 1935-7]; and with an E crosscut driven c.60' without meeting lode (MRT UR 1951/113-161, 123).
No. 2 Prospecting Shaft	1937-38	<ul style="list-style-type: none"> ▪ between c. Jan 1937 and Nov 1938 – this shaft is sunk 42' vertically and has been driven for 42' SW partly along the Clarke lode; noted as being located 190' NE of the underlay shaft [Blissett (1961) indicates this is in the area of CSA3 - probably current hole at N end of CSA 3] with collars at approximately the same level (MRT UR 1938/42-46) (note - MRT UR 1951/113-161 describes the sinking of the No. 2 Prospecting Shaft to 41' as occurring in 1939-41 – this appears to be an error); ▪ 1939-41 – mining continuous under the Montana Western Extended SL Co. and Montana SL Co. and includes driving S at the 41' level & stoping (MRT UR 1951/113-161) (note - this work may have occurred in 1937-38, see above); ▪ 1947-1950 - part of the mine leased on tribute to R.E. Clarke and T. Brampton and worked continuously; work included connecting the No.2 Prospecting Shaft with the Main Adit [Adit 2]; no work done at the 100' & 150' levels'; and all access was by the Main Adit (MRT UR 1951/113-161). ▪ by 1951 (Jul) – described as ‘sunk from the crest of the hill in the vicinity of the cuts and costeans’; sunk vertically to 42', with a SW drive partly in lode matter for 42'; a small cuddy cut in the lode at the bottom of the shaft (MRT UR 1951/113-161, 123). ▪ 1951 (Dec) - 1952 (Jan) – ore extraction and mine development work at the mine' ongoing; it does not include active use of the No. 2 Prospecting Shaft but mainly includes work in the Main Adit drives and the No. 1 Prospecting

		Shaft, including underhand and standard stoping at the adit level and considerable stoping at the 100' and 150' levels (MRT UR 1952/3-7).
Adit 1 (Eastern Adit)	1935	<ul style="list-style-type: none"> ▪ 1935-1937 – G.W.S. Clark's prospecting party drive the eastern drive and some associated adit drives (MRT UR 1951/113-161) – since the adit is in place by 1936, it appears to have been opened in 1935; ▪ in place by 1936 and still being worked ; described as a prospecting adit 363' NNE of the underlay shaft; driven at 173°, intersects the Clarke lode at 20', then driven along a cross fracture to the SSE for 86' to reach the next lode (but not completed) (MRT UR 1936/24-26); ▪ 1938 – a photo of the Montana SL Mine shows a short NE-SW finger dump/mullock pile in the general area of the Eastern Adit (below main crest on W side of small gully) (G. Dickens research); ▪ by 1951 (Jul) – described as a 'crosscut driven SW for 52' where the lode is met and a S drive put in for 17'; the main drive continued E for 88' and a SE cross cut driven for 40' (MRT UR 1951/113-161, 123); ▪ 1951 (Dec)-1952 (Jan) – the Eastern Adit [Adit 1] is 'being cleaned out and rails laid into the drive onto the lode' with the intention being to 'make a connection with the adit [Adit 2] level drive and bring out all ore above adit level via the Eastern Adit' (MRT UR 1952/3-7).
Adit 2 (Main Adit)	1937	<ul style="list-style-type: none"> ▪ 1935-1937 – G.W.S. Clark's prospecting party drive 'an adit in an easterly direction for c.60' [Adit 2?] at the same level as the base of the underlay shaft; and drive a crosscut as far as the lode (MRT UR 1951/113-161); not in existence in Nov 1936 (MRT UR 1891-1969/83-84) so appears to have been driven in 1937; the adit entrance is 464' SW of the main shaft and located 49' below collar of underlay shaft and 6' below the collar of the main shaft (MRT UR 1938/42-46); ▪ by Nov 1938 it has two drives – drive 1 (North Drive) – follows Clarke lode for 117' NE, then 29' on western lode; & drive 2 – 42' SW with a rise at end connecting to the underlay shaft (Prospecting Shaft No.1) (MRT UR 1938/42-46); ▪ also by Nov 1938 the north drive alone (plus stoping) has produced 138 tons of first class ore (MRT UR 1938/42-46); ▪ 1939-41 – mining continuous under the Montana Western Extended SL Co. and Montana SL Co. and includes cutting a rise in the Main Adit [?] to connect to the No.1 Prospecting Shaft (MRT UR 1951/113-161); ▪ 1947-1950 - part of the mine leased on tribute to R.E. Clarke and T. Brampton and worked continuously; work included connecting the Main Adit [Adit 2] with the No.2 Prospecting Shaft; no work was done at the 100' & 150' levels'; and all access was by the Main Adit as the Main Shaft was not used (MRT UR 1951/113-161). ▪ 1950-1951 Nov) - operations resumed by the Montana SL Co. (from Sept 1950) with operations including working of (from) the Main Adit; also the ore from the adit is being jigged "and represents the sole saleable product of the mine at present [Nov 1951]", with ore from the main shaft being stacked until the mill (under construction at this time) is ready (MRT UR 1951/113-161, 121). ▪ by 1951 (Jul) – described as 'driven in SSE for 243', with a lode met at 168' from the portal and driven 26' NE and a small cuddy cut in the S wall of the adit; at 243' the drive intersects the 'main lode system' which has been driven NE (to 95', then veering into the headwall for 40' where it connected with a drive from the basal level of the No.2 Prospecting Shaft and winze and short prospect drive) and SW (to 63' in lode) and a connection made to the No. Prospecting Shaft at 37' (MRT UR 1951/113-161, 123); ▪ 1951 (Dec) - 1952 (Jan) – ore extraction and mine development work at the mine' ongoing; mainly includes work in the Main Adit drives and the No. 2 Prospecting Shaft; this includes underhand and standard stoping at the adit level and considerable stoping at the 100' and 150' levels; also the rise connection from the 100' level to the adit level has been modified to create an 'ore pass' with first class ore being trucked through the adit to the 'old jig', and with the milling ore going down the ore pass to the mill' (MRT UR 1952/3-7).

Trenches W of main workings	1935-1936	<ul style="list-style-type: none"> 1935-1937 – G.W.S. Clark's prospecting party create "all cuts on top of the hill" by 1951; later clarified as '5 cuts on the western flank of the hill near the SW corner of lease 11789M and 2 cuts on the eastern flank (excluding the 2 costeans) (MRT UR 1951/113-161); presumably includes the 3 trenches cut in the vicinity of the underlay shaft on a formation c.70' W of the shaft by Dec 1936 (MRT 1936 (Dec) report, 58.;
T1	1935-1937?	<ul style="list-style-type: none"> 1935-1937 – G.W.S. Clark's prospecting party create "all cuts on top of the hill" by 1951 (MRT UR 1951/113-161).
T2	1935-1937?	<ul style="list-style-type: none"> 1935-1937 – G.W.S. Clark's prospecting party create "all cuts on top of the hill" by 1951 (MRT UR 1951/113-161).
T3	1935-1937?	<ul style="list-style-type: none"> 1935-1937 – G.W.S. Clark's prospecting party create "all cuts on top of the hill" by 1951 (MRT UR 1951/113-161).
T4	1935-1937?	<ul style="list-style-type: none"> 1935-1937 – G.W.S. Clark's prospecting party create "all cuts on top of the hill" by 1951 (MRT UR 1951/113-161).
Costean 1	1908-1922 or 1923-27	<ul style="list-style-type: none"> 1908-1922 - the No.1 Costean was cut as part of prospecting initiated by the State Mining Engineer, Hartwell Condor (MRT UR 1951/113-161); 1923-24 & 1926-27 – GWS. Clark cuts a costean from the Main shaft (?) [No. 1 Costean?], which was filled in by 1951; also notes by 1951 there are 'several small pits' in the vicinity of the cuts [costeans] (MRT UR 1951/113-161).
T5 'Costean 2'	1923-27	<ul style="list-style-type: none"> 1923-24 & 1926-27 – G.W.S. Clark cuts No. 2 costean south of the underlay shaft (No. 1 Prospecting Shaft) (MRT UR 1951/113-161). 1935-1937 – G.W.S. Clark's prospecting party extends Costean No.2; also notes by 1951 there are 'several small pits' in the vicinity of the cuts [costeans] (MRT UR 1951/113-161).
Mill	1951	<ul style="list-style-type: none"> 1950-1951 - operations resumed by the Montana SL Co. (from Sept 1950) with operations including the installation of 'a milling plant' in late 1951, which in Nov 1951 is expected to 'be in operation shortly'; ore from the shaft is being stacked until the mill is ready (MRT UR 1951/113-161); 1964 – mill mostly intact but dilapidated; office & store building gone (no remains – possibly re-located); other buildings in poor repair & partly collapsing; no mullock to E of Mill (1964 image); 1970 – mill losing cladding, but otherwise intact; only other intact building is the winding house; no mullock to E of Mill but intact mullock to SE (SE of main shaft) (1970 images).
Western Jig	pre-1951	<ul style="list-style-type: none"> 1950-1951 - operations resumed by the Montana SL Co. (from Sept 1950) with extensive operations which include use of the Main Adit, with the ore from the adit is being jigged; it is noted that this ore "represents the sole saleable product of the mine at present [Nov 1951]" (the ore from the main shaft is being stacked until the mill (under construction at this time) is ready) (MRT UR 1951/113-161, 121). 1951 (Dec) - 1952 (Jan) – in the Main Adit - No. 2 Prospecting Shaft area the rise connection from the 100' level to the adit level has been modified to create an 'ore pass' with first class ore being trucked through the adit to the 'old jig' (and with the milling ore going down the ore pass to the mill) (MRT UR 1952/3-7).
SOUTHERN WORKINGS		
Adit 3	by 1936	<ul style="list-style-type: none"> in place by 1936 - a prospecting adit 179' SSW of the underlay shaft; driven for 20' at 234° where it intersects the Clarke lode, then driven for 88' along a W cross cut (no ore found) (MRT UR 1936/24-26); by 1951 (Jul) – noted as a "Southern Adit cross cut driven on a tortuous course for a total of 76' " [appears to be describing the main drive] (MRT UR 1951/113-161, 123).
Adit 4	1894-1937? (pre 1952)	<ul style="list-style-type: none"> many years old in 1952; in Aug 1952 described as No. 3 Adit on S.A. Clarke's lease (101M/47) and driven 325', apparently extending 185 beyond the lease boundary [-> likely to have been cut in the May Queen period & later (1894-1937)when the man mine lease area extended further south]) (MRT UR 1952/62-64).

Southern Adits – No. 1 Adit	1952	<ul style="list-style-type: none"> in 1952 (Aug) - the Adit No.1 has been driven 53' to the SE; has been driven by S.A. Clarke recently and is actively being worked by Clarke (MRT UR 1952/62-64); part of several adits and costean cut by S.A. Clarke on lease 101M/47 (20 ac) in an unsuccessful search for the possible southern continuation of the main lode of the Montana SL Mine (Geological Survey 1962, 213).
Southern Adits – No. 2 Adit	1952	<ul style="list-style-type: none"> in 1952 (Aug) - the No 2 Adit is 35' long, and has been driven by S.A. Clarke recently (MRT UR 1952/62-64); part of several adits and costean cut by S.A. Clarke on lease 101M/47 (20 ac) in an unsuccessful search for the possible southern continuation of the main lode of the Montana SL Mine (Geological Survey 1962, 213).
Southern Shafts (1 & 2) (= S. Holes?)	?c.1913	<ul style="list-style-type: none"> 1913 – government prospecting in general area (2,000+ feet of trenches cut and several shallow (c.7') shafts sunk, possibly including the two shallow shafts and some of the trenching in the area (Geological Survey 1962, 212; MRT UR 1952/62-64). in Aug 1952 - the 2 shallow shafts are c.20' deep (but groundwater prevented them being inspected) (MRT UR 1952/62-64).
T6	by 1936	<ul style="list-style-type: none"> Presumed to be associated with the excavation of Adit 3, or prior prospecting, therefore in place by 1936, as was Adit 3.
T7	by 1936	<ul style="list-style-type: none"> Presumed to be associated with the excavation of Adit 3, or prior prospecting, therefore in place by 1936, as was Adit 3.
T8	1894-1937? (pre 1952)	<ul style="list-style-type: none"> Appears to be associated with Adit 4 which was “many years old” in 1952; since Adit 4 is described as No. 3 Adit on S.A. Clarke’s lease (101M/47) in Aug 1952, the Adit, and trenching, are likely to have been cut in the May Queen period & later (1894-1937) when the man mine lease area extended further south) (MRT UR 1952/62-64); considered unlikely to have been developed by S.A. Clarke in 1952 (MRT UR 1952/62-64).
T9	1894-1937? (pre 1952)	<ul style="list-style-type: none"> No information available - presumed to be associated with the early prospecting in the area (May Queen period & later (1894-1937)) when the man mine lease area extended further south) (MRT UR 1952/62-64); considered unlikely to have been developed by S.A. Clarke in 1952 (MRT UR 1952/62-64).
T10	1894-1937? (pre 1952)	<ul style="list-style-type: none"> No information available - presumed to be associated with the early prospecting in the area (May Queen period & later (1894-1937)) when the man mine lease area extended further south) (MRT UR 1952/62-64); considered unlikely to have been developed by S.A. Clarke in 1952 (MRT UR 1952/62-64).
costeans & trenches south of creek	? c.1913 & 1952	<ul style="list-style-type: none"> 1913 – government prospecting in general area (2,000+ feet of trenches cut and several shallow (c.7') shafts sunk, possibly including the two shallow shafts and some of the trenching in the area (Geological Survey 1962, 212; MRT UR 1952/62-64). in Aug 1952 - the 12 costeans [the map suggests there are 13 costeans] have a total length of 579', and most have been dug recently by S.A. Clarke (MRT UR 1952/62-64).

3 PHYSICAL DESCRIPTION

The full Montana SL Mine, including all the identified historical workings, encompasses an area of some 850m (N-S) x 350m (E-W). It extends from the 'northern workings' (Jones Prospect) on the north side of the Corinna – Zeehan Road and immediately north of the old Stanley River Track, and runs south across the Corinna – Zeehan Road to where the main workings are located on, and adjacent to, the northern half of a low hill and where they are at their widest, then runs south to the 'southern workings' which are located at the south end of the hill and south across the creek and onto the next low hill (refer Figures 2 and 6).

The individual features are described in summary in Table 1. A plan of the central and southern surveyed part of the Montana SL Mine and the surveyed northern workings is provided as Figure 6A and B respectively.

The nature and preservation of the underground workings was not investigated, hence is unknown. Un-investigated workings whose location is known are shown in Figure 6 (in blue).

3.1 Main Mine Workings

The main mine workings cover an area of c.240m by c.350m. The workings survive essentially as archaeological remains, with no buildings left intact and no in situ equipment left on site. All periods of workings however are present, and although most of the features survive relatively unmodified post-mine operations, a small number of features have not survived, including key features such as the No.1 Prospecting Pit (underlay shaft).

The northeast part comprises the main shaft (now capped with a concrete cover, but seeping acid mine drainage) and associated building remains and remnant mullock heaps. North and northeast of the main shaft is one of the two main areas in which mullock from the main shaft was stockpiled prior to 1951 when the ore processing mill was built. A large amount of this mullock was processed, but the original outer limit of the mullock (to its original height) is preserved as a narrow, sinuous, mostly continuous mound (except on the west edge where it has all been removed). The interior of this area is flat or low hummocks representing the excavated remnants of this stockpile. In the northeast corner the full area of the stockpiled mullock appears to be preserved, although this section has had a channel cut through it in c.2004-05 in an attempt to drain the seepage from the main shaft back into the main creek. Some concrete slabs were noted in this area, and these are interpreted as the broken and moved foundations of one of the mine buildings. On the east edge of the main shaft is an area of swamp, largely caused by the pooling of seepage from the main shaft. This is also an area where two of the mine buildings were located. There is however no visible evidence of these today, partly due to the swampy, vegetated nature of the area.

To the southeast and south of the main shaft is a low hill which joins to the main hill (in the central mine area) to the west. The slope of this hill above the main shaft has another area of stockpiled mullock. This mullock has been dumped as a series of benches, with two main central benches and a small upper (on crest) and lower (just above the flats) benches. This area is accessed by a benched track, presumably contemporary with the mine. The photographic evidence suggests this mine waste was deposited in the last phase of operation of the main shaft. There is a more modern track that cuts the central eastern part of the mullock (apparently part of the 2008 TNT Mines Pty Ltd mineral exploration work).

Immediately west and northwest of the main shaft is the area in which the mine buildings were mostly located. This area is flat and has presumably been levelled. It contains only remnant features, including sections of foundations, a brick chimney and associated low mound of brick rubble (collapsed flue?), a

cgi water tank, a pile of cgi sheet, one broken ore bucket, what appears to be an in ground water tank (or forge hearth?), and a general scatter of fragmented metal, timber and glass. There is no clear evidence of any of the buildings mapped in 1951 (refer Figure 6A), but the location of some, such as the winder house, can be interpreted from the remains.

Massive c.2m high concrete foundations in a c.24m x c.12m rectangle, located c.35m northwest of the main shaft, are the remains of the mill (ore processing) building. This building has no intact framing, or roof or wall cladding, and no equipment. The concrete foundations however are intact, and the machinery and equipment stands (of concrete) are all intact, which together with a few timber railings and iron fixtures, allows the operation of the mill building to be interpreted. Two lines of concrete piers lead southeast from the south end of the mill building to the area where the ore bin and ore crusher were located, and these are interpreted as the supports for two conveyor lines for crushed ore. Behind the mill to the south on the north crest of the main hill are the largely intact foundations of two other buildings, and beyond this a large water tank and a concrete engine bed. The two buildings are likely to relate to the mill, but it is unclear what the water tank and engine bed relate to. Photographic information suggests water from the water tank fed the winder house (possible for a steam engine?).

The processed ore was dumped in an area to the northwest, which today makes up the northwest corner of the central mine workings. This tailings area (Tailings Area 1) is c.120m (E-W) by 70m (N-S) and comprises low mounds of coarser tailings at the east end and along the south side, with a flatter area of fine tailings in the northwest area. The drainage of the main creek has been disrupted by the deposition of the tailings, but the creek has re-cut a number of channels (distributaries) through the tailings area. There is no evidence of the dam mapped in this area in 1951. Two large channels (c.3' wide) drain the general area – one runs south of the tailings area, but cuts its extreme southeast corner, as well as cutting through an historical track to the western adit (Adit 2), and the other has been cut to the north of the tailings, but has disturbed the far northeastern corner of the tailings. These two channels were cut in 2004-05 as part of earlier remediation works.

There are no historical workings in the southeastern part of the central workings, but the area has been disturbed superficially (cleared and lightly bulldozed) by modern exploration work. The central southern part of the main area of workings, which is on the crest of the main hill, however was the core area of the underground workings. At the north end, c.35m southwest of the main shaft and in the head of a small gully is the entrance of the Eastern Adit (Adit 1). This adit has a short entrance and the portal is blocked. It has very little tailings in front of it, but there is a single linear dump c.25m to the southeast (on the east edge of the large mullock piles from the main shaft) which may be mullock from this adit.

This central area also contains a large (c.65m long by c.35m wide) area of collapsed stoping (probably historical). There are four main collapse areas and one small collapse feature in this area. The larger collapses are c.20m x 10m, have steeply sloping sides, sections of cliffed edge and contain in all but one case (CSA 2) vertical or near vertical openings into the underground workings. These openings are all small (<4m across and usually c.1-2m across). The northern opening in CSA 3 is interpreted as the shaft of the c.1937-8 No.2 Prospecting Pit (a vertical shaft). These stopes are understood to be mainly worked from 42' below the hill crest (Adit 2 level).

There is a flat unvegetated gravelled area c.30m x 40m immediately to the south of the collapsed stoping, and another unvegetated, but benched area c.20m x 15m immediately to the east. Both of these areas are over areas of underground working, and the southern area includes the location of the No.1 Prospecting Pit (an underlay shaft, and the first main worked shaft of the Montana SL Mine). These two areas appear to have been infilled and/or levelled as part of the site rehabilitation following the 2008 mineral exploration. There is another c.35m by c.10m cleared area to the south which also appears to be the result of recent mineral exploration, although it is possible there may have collapsed stoping in this area.

The southwest quarter of the main workings contains the main western adit (Adit 2) and associated mullock dumps (in the form of finger dumps), a processing area and a tailings area. The adit is located at

the base of the hill slope (western slope), and there is a preserved benched track formation which runs north along the side of the hill, then east around the north edge of the hill to the main shaft area.

The adit is driven directly into the hill side, but appears to be blocked c.7m inside the portal. There are remnant mine timbers at, and just inside, the portal. The roof of the portal is slumped and the floor of the portal is water filled (orangey water). The water in the adit appears to continuously seep out, creating a swampy area on the c.7m wide bench in front of the portal entrance and then draining to the northwest and southwest around the mullock from the adit. This mullock primarily takes the form of two very long (c.45m & 40m) narrow finger dumps extending west from the bench in front of the adit. The finger dumps are well preserved and also have remnant tramway timber piers and sleepers preserved.

Immediately northwest of the adit entrance is an approximately rectangular level platform c.17m x c.11m, that sits c.1m above the tailings area. The north edge of the platform has the remains of a timber retaining wall, and there is an arrangement of timber in the northwest corner that appears to be the foundation for heavy equipment. This is interpreted as the location of the jig that operated in this area. There are additional bedlogs immediately to the west on the tailings below, and a line of remnant sleepers runs northwest from this area across the tailings area.

The tailings from the jig extend to the west through to the north of the jig platform for up to c.50m distance. To the west is a discontinuous string of low mounds (possibly excavated and reworked later). To the north the tailings occur as a relatively flat bench, and in the central northwest area is a fan of six relatively short (c.7m to 20m long) finger dumps, all of which are well preserved except for the southernmost one which has had a track bulldozed through it (and which may have been partly removed for reprocessing). There is a c.20m long area of fine tailings at the extreme western end of the tailings area. Two artefacts of probable c.late 1800s – early 1900s age were located in this main tailings area (on the northern edge), suggesting that this area was used considerably before 1937, which is the date that Adit 2 is understood to have been driven. There is a scatter of other mine related artefacts, mainly highly fragmented timber and metal, but also two lengths of railway iron.

This area appears to have had minimal post-working disturbance except for a bulldozed spur track off the main track leading down onto the tailings area and two bulldozed routes to the west through the tailings. These are probably late period mine tracks rather than post-mine operation tracks, with tailings being recovered for processing at the mill.

3.2 North Montana Workings (Jones Prospect)

The northern workings occur in a small, west draining valley where the terrain opens from hills, to plains to the west. The area of working identified in the survey is c.85m along the valley and c.50m across the valley. There may however be an additional historical working further uphill on the north slope (eg, the No.1 Edwards Adit) and more workings further downstream (although these are unlikely to extend more than an additional c.25-30m).

The workings survive as archaeological remains only, with no buildings and no in situ equipment evident in this area. Known workings and other workings and features (eg, a dam) were identified, but a number of historically referenced workings were not identified in the field (ie, main shaft, and the Edwards No1 & 2 Adits).

The main area of workings is immediately upstream of the benched formation of the Stanley River Track which runs SE-NW through this area, contouring around the lower slopes of the hills in this area just above the plains.

On the south bank just north of the track formation is a short small trench cut at an angle into the hillslope, and beyond this is a c.20m long by c.10m wide area of what appears to be collapsed or creek eroded bench, which has a c.10m long, low vertical cutting into the hillslope behind with diagonal small shallow trenches running down into to each uphill corner from above, and interpreted as water diversion

drains above workings. The bench has a central depression (c.1m deep) filled with cutting grass. This depression in the benched area appears to be the most likely location for the 35' shaft that is known to have been sunk in this area, with the depression likely to be the partly collapsed top of the shaft. Immediately upstream of the benched area is a series of three large (3'+ wide) trenches of variable lengths (5-13.5m) (these do not appear to be adits) cut into the hillslope, and upstream of these is a short small (c.1.5' wide) trench cut diagonally into the hillslope. The trenches are all cut in approximately horizontally with the floors at approximately the base of the valley slope.

On the north bank, c.25m NW of the probable shaft area and just above the valley floor, there is a short large (3' wide) trench with a small bench formed of excavated material at the entrance (this does not appear to be an adit). Approximately 40m upstream, also on the north bank, is an adit whose entrance is c.3-4m above the creek bed. The adit entrance is relatively wide and deep, and there is a c.25m long finger dump running along the north side of the creek from the adit entrance in a downstream direction. The finger dump is slightly lower and narrow in its downstream part, suggesting it was formed at two different stages, or that the lower section is mullock from the main shaft (the west end is opposite the presumed main shaft location) and the higher section is later mullock from the adit. The adit, which is flooded with clean water, is of a typical size, but the roof is squarer cut than the other adits in the area, and there is some remnant timbering just inside the portal. This adit is interpreted as the adit cut in from Syd's Cut (refer Section 2.2 and Table 1). Just above the adit is a short small fall line trench.

Approximately 25-30m upstream from the north bank adit and the top south bank trench are the remains of a presumably contemporary earth dam. The dam wall is straight, c.12m long and 2m high and constructed across the valley floor. The dam wall has been breached by the creek near the south end. There is a wide flat area immediately upstream which would have been previously inundated. There is a small bench on the north bank with a vertical cutting back into the hillslope. This may have been cut to get earth for the dam, but might also have been cut to provide access to the other two adits which are interpreted as being just upstream, one near the valley floor and one some distance upslope. There are no water races associated with the dam. No survey was undertaken upstream of the dam due to time constraints.

All the above features appear to date to between 1894 when the first lease was taken out and c.1926. The historic documentation suggests that the main shaft and Syds Cut (but not the adit) were made earlier than the other features, which were all the work of Jones' later prospecting party. It may be that the small trenches date to the earlier period of working as well. None of the identified features appear to have been modified since the pre-1926 mine operations and the full area of workings also does not appear to have been modified since except for some creek erosion and deposition in the valley floor, which appears to have obscured the shaft understood to be in this area.

There has been later exploration in the area (date uncertain, but c.1947-1958, or post mining in the area) which is evident as two lines of roughly parallel c.E-W bulldozer cuts. One line runs up the broad spur crest on the north side of the creek (and runs to within c.10m of the historic workings), and the other line runs up the broad spur crest on the south side of the creek from just above the Stanley River Track formation which it has partly bulldozed in this area. The bulldozer cuts are significantly different to the earlier trenching – they are only partially revegetated (with heathy and scrubby plants) and are generally c.3-4m wide, c.10m to c.25m+ long, and mostly c.15m or 20m apart.

3.3 South Montana Workings (incl. Clarke's Lease)

The southern mine workings are understood from the historical literature to cover an area of c.130m (E-W) by c.170m (N-S). Only the workings north of the E-W flowing creek (Barnetts Creek) (an area of c.90 x 120m) have been investigated however, and not all features identified in the historic literature were identified in the field. The identified surviving workings are all archaeological remains and there is

no in situ equipment. All the identified features appear unmodified since mine operations ceased, and the area of workings more generally also appears not to have been modified.

Identified features in the southern area of workings comprise two adits with associated mullock heaps and trenches, and two isolated trenches:

One adit (Adit 3) is located just above the base of the hill on the west side, c.100m south of Adit 2 (part of the main mine workings). This adit is of a typical shape and size, and has a short open drive which continues c.7m beyond the portal, where it makes as a sharp RH bend. The adit is dry and appears open. Outside the adit there is a small bench which is part of a short, but steep finger dump of mine waste which runs straight out from the adit onto the edge of the plains beyond the hill. This adit crosscuts a small trench with offset trenches which appear to be part of the costeaning in this area which resulted in the adit being located where it was.

The second adit (Adit 4) is located c.75m SSE of Adit 3, and its entrance is at the base of the hill on its south side. This appears to be a larger working as it has a c.45m long E-W trending finger dump (with 2 heads) associated. This finger dump appears to have been oriented E-W to avoid blocking Barnetts Creek which runs E-W c.20m south of the adit entrance. There is also a long, medium sized trench running approximately along the contour off the W side of the adit entrance, which is interpreted as the exploratory trench prior to driving the adit. The adit, also of a typical shape and size, appears to be driven straight into the hill. The adit floor has pooled water of an orangey colour, which appears to seep out in wet periods. It appears that the floor of the open entrance to the adit has been partly filled with sediment (presumably washed out of the adit).

The two other trenches are medium sized (2' wide), and located at the SE end of the hill at the base of the slope. One, c.20m E of Adit 4, has two connected linear sections that cut across the low spur between Barnetts Creek and a tributary drainage to the north, and the other, which is only c.10m north, is a short linear trench into the hillside. A short section of vegetated light benching was noted near the linear trench and may be the remains of an historical track (bridle track). It could not however be traced further than the section noted.

These workings are all likely to be comparatively old, and are older than the main area workings, based on the re-vegetation of the features, and in the case of the trenches, the lack of discussion of these in the historical literature (the other trenches and costeans are recorded in the comprehensive description of this area by Taylor & Burgess (1951)). Although it is difficult to reliably use trees for dating sites, the relatively large sized eucalypts growing on the top of the Adit 4 finger dump, suggests this working is in the order of 75-100+ years old, with no later disturbance. This is consistent with the pre-1936 date for Adit 3 and the description of Adit 4 as being 'very old' in 1952 in the historical literature (refer Section 2.2). This suggests that these southern workings date to the early period of mining (1894-1902) or the slightly later prospecting period (c.1902-1927), and not to the early 1950s when renewed exploration was undertaken in the area by S.A. Clarke (note - none of Clarke's workings were inspected). A possible age is c.1913 when the government is understood to have carried out considerable surface exploration in the general North Zeehan area.

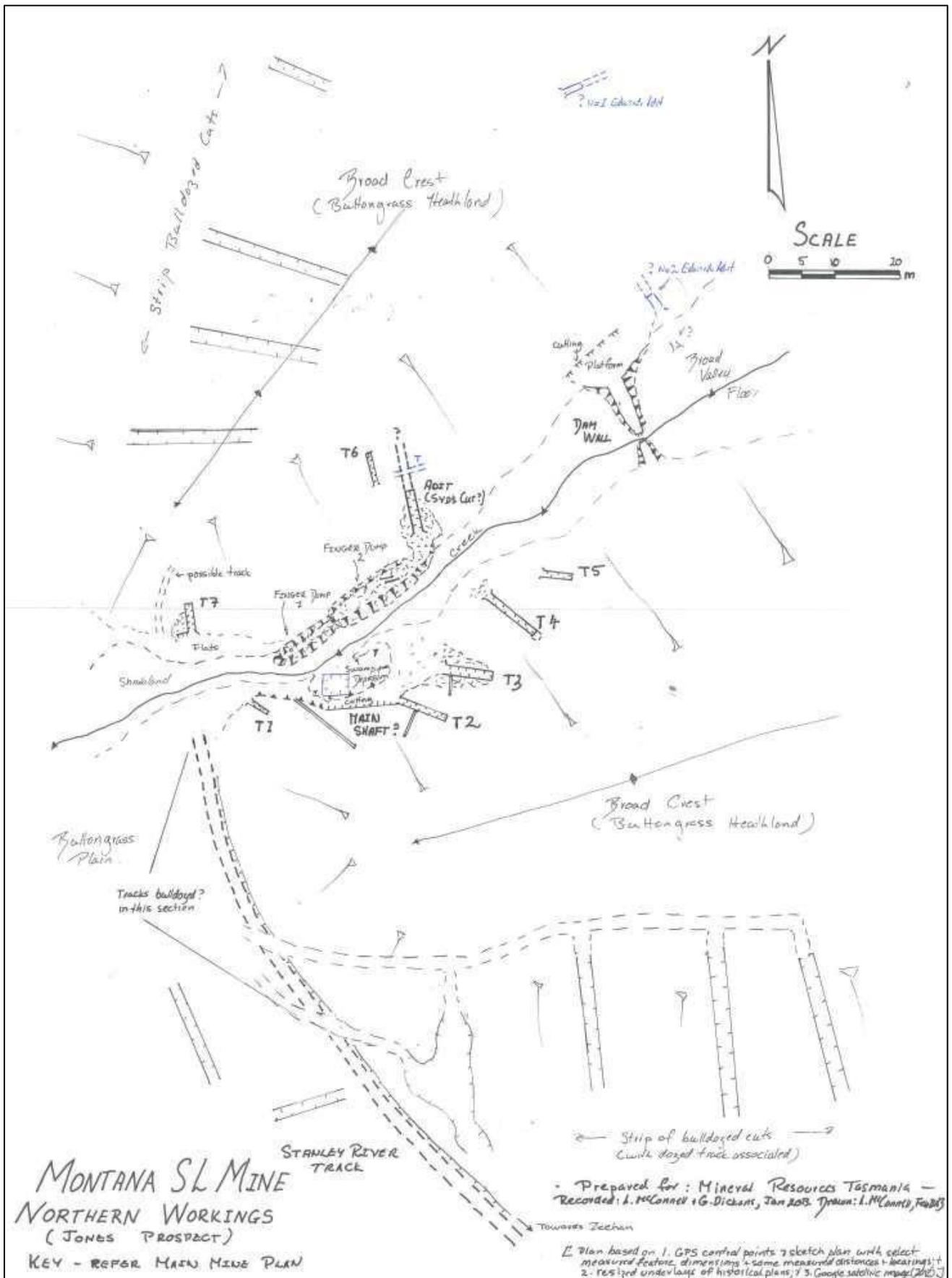


Figure 6 B Sketch Plan of the Montana SL Mine Northern Workings showing the historical mine features identified through field survey, Jan 2013.

Table 1 Age, physical description, condition and significance of the identified historical features of the Montana SL Mine.
(Note – significance shown in *italics* is indicative significance only)

FEATURE	DATE CONST ^N	DESCRIPTION	CONDITION	SIGNIFICANCE
NORTHERN WORKINGS				
Northern Shaft & etc.	? (1894-1926)	<ul style="list-style-type: none"> not relocated; known to have been 35' deep; probable location is on S/E bank of creek in valley floor c.5-10m north of the end of the Stanley River Track formation; the area has been cut back slightly into the hillslope and levelled, and the likely main shaft area is a large (c.10m x 5m) irregular depression into the levelled area that extends into the creek channel; above the levelled area and on each side is a long shallow narrow (c.1') trench, presumed to drain water from the shaft area. 	<ul style="list-style-type: none"> if this is the location of the shaft, then the collar is not preserved and there has been collapse of the edges and inwashing and infilling due to creek flooding. 	<ul style="list-style-type: none"> <i>moderate-high</i>
Syd's Cut Adit	1936 (Dec)	<ul style="list-style-type: none"> presumed to be the adit with associated finger dumps (only adit located by the survey); adit is c.3-4m above the creek on the N/W bank; open entrance to adit is 7.5m long on a bearing of 166°; not surveyed beyond the portal (due to water on the floor); remnant timbering just inside portal. 	<ul style="list-style-type: none"> the portal is open and moderately well preserved (ie, minimal collapse); floor of adit beyond the portal is flooded. 	<ul style="list-style-type: none"> <i>moderate-high</i>
No.1 Edwards Adit	1936 (Dec)	<ul style="list-style-type: none"> <i>not relocated</i> 	<ul style="list-style-type: none"> <i>not relocated</i> 	<ul style="list-style-type: none"> <i>moderate-high</i>
No.2 Edwards Adit	1936 (Dec)	<ul style="list-style-type: none"> <i>not relocated</i> 	<ul style="list-style-type: none"> <i>not relocated</i> 	<ul style="list-style-type: none"> <i>moderate-high</i>
Trenches	<1936	<ul style="list-style-type: none"> cluster of 5 trenches on the S/E bank immediately upstream of the presumed shaft area; apart from the northernmost trench these trenches are all large deep trenches (c.3' wide x 1.5-2m deep and in the order of 5-13.5m long, with a low spoil mound along at least one side; the northern trench and a trench <5m south of the shaft area are both small trenches (ie, c.1-2' x 1-1.5m deep) with no spoil; on the N/W bank a large trench (5m long x 3' wide x 1.5-2m deep) bearing 171° occurs just above the creek flats S of the shaft area.. 	<ul style="list-style-type: none"> moderately good condition as still preserved but with minor wall collapse and abundant vegetation growth. 	<ul style="list-style-type: none"> <i>moderate</i>
Dam	<1936	<ul style="list-style-type: none"> earth walled dam at the upstream end of the site– the area behind is a wide flat valley area and the dam is located where the valley narrows; the dam wall is comprised of earth & rock, has a flat top 2' wide (basal width c.8') which spreads out into a wider levelled area on the N side (excavated for fill), and is 12m long and c.2m high. 	<ul style="list-style-type: none"> dam wall is well preserved but has been breached near the S end by the creek. 	<ul style="list-style-type: none"> <i>high</i>
Stanley River Track	c.1914	<ul style="list-style-type: none"> c.8-9' wide benched formation with a c.0-1m vertical upslope cut; in area of mine the track is benched into white local quartzitic gravels and bedrock (no surfacing is evident); there is no bridging over small creeks which appear to have been forded, and there is no evidence of the track within c. 5-10m of the creek in which the workings occur (eroded/buried?); the track has been partly bulldozed below the cuts on the crest to the E. 	<ul style="list-style-type: none"> the track appears well preserved except for small sections where it crosses creeks and has been washed out, or where it has been crossed by later machinery. 	<ul style="list-style-type: none"> <i>very high (site of high regional significance)</i>
CENTRAL (MAIN) WORKINGS				

Main Shaft (May Queen Shaft)	1894-96	<ul style="list-style-type: none"> ▪ above ground today is evident as a concrete slab cap (c.2m x 3m) located c.20m SE of the mill building; there is associated mullock to the N, E and S (see below), and the foundations of a number of the mine buildings, including the mill, ore crusher and winder house, occur within c.30m of the shaft (see below). ▪ in the last phase of mining the shaft was sunk (vertically) to 297' with extensive workings (drives, rises, stoping and a bypass drive) off the main shaft at the 100' and 150' levels (& possibly c.40-42' level); the main shaft was a 3-compartment shaft (c.12' x 4'?). 	<ul style="list-style-type: none"> ▪ condition of underground workings unknown; shaft capped and no evidence of historical mine collar or shaft evident; the mine is flooded and continuously seeps water (acidic); no head frame. 	<ul style="list-style-type: none"> ▪ high
Main Shaft Mullock	1894-96	<ul style="list-style-type: none"> ▪ The mullock areas associated with the man shaft comprises two main areas – N & NE of the shaft (stock piled in 1937-1938 for later processing) and SW & S of the shaft (stockpiled by 1951); all mullock appears to have been stockpiled as a continuous dump c.1-2m high rather than as finger dumps (implies truck not tramway dumping). The S&SW area is a continuous area of 3 benches (possibly 4), from the hill crest down to the lower slope (but not onto the wet valley floor), while the NE & N area is on flat land and comprises a lobate area of low hummocky mounds (largely intact) in the NE, and a mostly continuous 'perimeter' mound on the N side – this later being the only remnant of the mullock with the inner material having been removed (for processing). 	<ul style="list-style-type: none"> ▪ poor to good condition –the NW section is poorly preserved – largely removed (possibly historically); the N and E areas have had much of the mullock removed (for processing) but the outer edges appear extant; and the SE-S area appears to be well preserved. 	<ul style="list-style-type: none"> ▪ high
Main Shaft Buildings	1951	<ul style="list-style-type: none"> ▪ no intact buildings remain and the general area of the former buildings is swampy in part, heavily vegetated in part and bulldozed carpark in part. While there are a number features such as piers for conveyors, parts of foundations, a brick wall, an iron water tank, a pile of brick rubble, a pile of cgi roofing iron, an ore bucket and a general scatter of metal objects (mostly fragmented) in the area, it is not possible from the remains to determine the locations or functions of the former buildings (these are only know from the 1951 map). ▪ the remains of the building are as follows – <ul style="list-style-type: none"> ▪ there is no evidence for the main office & store (although the pieces of concrete foundation found in the diversion channel to the S of the original location may be part of this building); ▪ the changing rooms and fitting shop are not evident (but may be obscured by the swamp in this area); ▪ the only remains of the winder house is a vertical brick wall with fireplace/hearth at the back of a deep rectangular (c.2m x 3m) cutting which appears to be the base of the round brick chimney stack shown in the 1950s photo and presumably for the winder engine; a pile of brick rubble in front of the cutting is presumed to be collapsed chimney; there is also a bed log just behind (W) and slightly up hill of the brick wall which has a small number of spikes in the top, but the purpose of this is not known; also to the rear and shown in the 1950s image, but not extant today is a pipe running up to Water Tank 1, suggesting that water for the steam engine came from this tank; ▪ there is a small rectangular foundation (concrete and brick) with a central vertical sided cavity and associated loose water pipe (possibly a well or in ground water 	<ul style="list-style-type: none"> ▪ the original buildings survive only as partial foundations and some archaeological features and objects; apart from building materials and equipment which have been presumably largely removed, the area appears undisturbed except by natural decay processes. 	<ul style="list-style-type: none"> ▪ medium-high

		<p>tank),</p> <ul style="list-style-type: none"> no evidence of the compressor location was noted, but timber bed logs with metal spikes were located sc.6-8m SE of the brick wall & brick rubble and may be the compressor bed; there is no evidence of the ore bin or crushing shed, although there are two sections of concrete foundation that may be part of the crushing shed; and the line of the conveyor from the crusher to the mill is evident, but there are two lines of concrete piers, one cut into the slope with some timber framing in the lower part, and one which starts slightly to the W and runs to the same point of the mill (S face) which has slightly larger concrete piers, suggesting the conveyor was rebuilt at some stage. 		
Mill	1951	<ul style="list-style-type: none"> the mill building has mainly been sited on flat land but its construction has required some excavation into the hillside (on SW corner of building); the extant mill remains comprise the two storey concrete foundations of the building (but the framing, walls and roofing have gone - presumably removed for re-use); the mill building is c.23.5m long x 14.5m wide, and the foundation height to main floor level is c.5'4"; of shuttered concrete (except for the N wall (crushed ore loading area) which is largely horizontal timber beams), with the machinery mainly housed on one level, but with a second storey in the SW corner, the main floor has a number of concrete plinths, presumably for seating equipment or ore conveyors, some timber rails and iron beams survive; no equipment other than an ore crusher bin (corroded) and one other small metal bin survive in the mill site; there is also a small square space off the W side (office) with asbestos sheet fragments on the concrete floor, and beyond this c.2.5 m is another concrete foundation of 6'6" x 5'6". 	<ul style="list-style-type: none"> the foundation and equipment plinths are extant and in relatively good condition, but nothing else survives of the mill building except for two metal bins, some timber rail, and some metal equipment fixtures. 	<ul style="list-style-type: none"> high
Watertank 1	nd	<ul style="list-style-type: none"> large, round, metal (iron sheet) watertank (diameter – 16'6", height - c.7-8') on upper hillslope near crest. 	<ul style="list-style-type: none"> in situ; corroded and with parts of the side missing 	<ul style="list-style-type: none"> low-medium
Engine Bed	nd	<ul style="list-style-type: none"> concrete engine bed of two long concrete rests (each c.2' high x, 9" wide x c.8' long, & c.4' apart); on hillslope above mill and winding house and earlier ore crusher; concrete shuttered concrete with aggregate; 	<ul style="list-style-type: none"> engine bed is in good condition, but there are no engine remains 	<ul style="list-style-type: none"> low-medium
Tailings Area 1	1951	<ul style="list-style-type: none"> the tailings are spread out over the lower part of the flats drained by the main creek, and due to the drainage disturbance the surrounding terrain is swampy. The area is to the NW of the main shaft and mill, and connected to them by a track (see <i>Track Main Shaft – Adit 2</i>). The tailings are an approx. triangular area (c.120m E-W x 70m N-S) which is widest at the E end and tailing to a point at the W end; the tailings comprise low mounds of coarser crushed rock at the E and SE end, with a tail extending to W, and flat areas of the finer tailings, mostly along the northern edge; the finer tailings may be washed in from the creek, or off the coarser tailings. The tailings appear to have been cut through by channels of the local creek post-deposition. There was a dam on the main creek channel which is not evident (possibly buried); the extreme SE corner of the tailings area has been disturbed by the cutting of a recent (c.mid-2000s) diversion channel; and the NE edge has been disturbed by the cutting of a recent (c.mid-2000s) diversion channel and dumping of spoil. There is a concentrated scatter 	<ul style="list-style-type: none"> the tailings is largely intact but have been disturbed by the cutting of water diversion channels in the NE and SE corners, and there has been some erosion across the tailings by water flow (from creek distributaries in high rainfall periods). 	<ul style="list-style-type: none"> high

		of fragmented objects – mainly iron and timber (probably broken mine equipment) on the N edge in the centre, and there is a sparse scatter of fragmented iron and timber across the full tailings area; and there is also a widespread scatter of fragmented modern glass in the SW part of the tailings.		
Underlay shaft (No. 1 Prospecting Shaft)	1894-96 or 1935-7	<ul style="list-style-type: none"> no surface evidence; the underground workings (not inspected) comprise a shaft sunk to a vertical depth of 51' at 60° to the E, with extensive drives and stoping, and with connections to the No.2 Prospecting Shaft, the Main Adit and Main Shaft. 	<ul style="list-style-type: none"> opening destroyed by post-1960 mineral exploration; condition of underground workings unknown 	<ul style="list-style-type: none"> high
No. 2 Prospecting Shaft	1937-38	<ul style="list-style-type: none"> appears to survive as an irregular c.3m x 1.5m opening in the base of a largely infilled collapsed stope area – no shaft related features visible at the surface; the underground workings (not inspected) comprise a vertical shaft sunk to c.42' with extensive drives and stoping, and with connections to the No.1 Prospecting Shaft and Main Adit. 	<ul style="list-style-type: none"> appears to be in an area of collapsed stoping with shaft possibly still open; condition of underground workings unknown 	<ul style="list-style-type: none"> high
Adit 1 (Eastern Adit)	1935	<ul style="list-style-type: none"> the entrance to the adit is cut into the main hill in the head of a small gully on the N side, the entrance is blocked (appears to have been filled?) and the tunnel cannot be (adit originally driven at 173°); entrance has some associated mullock (a small bench?); an older discrete finger dump (& partly removed) on approx same level but to S is possibly early mullock from this adit. 	<ul style="list-style-type: none"> entrance poorly preserved; condition of underground workings unknown 	<ul style="list-style-type: none"> high
Adit 2 (Main Adit)	1937	<ul style="list-style-type: none"> the adit is cut into the W side of the low hill at the base of the slope on a bearing of 121°; the open entrance is 6' long x 3'6" wide x c.5' high at the portal (but the roof of the portal has slumped). Inside the portal the tunnel width is 5'; the adit appears blocked (collapse/fill) c.5-8m in from the portal (& underground workings not further inspected); there are remnant timbers just inside the portal; the adit floor is flooded (water acidic). The entrance has a 7m wide bench to the W (now swampy with seepage from the adit) with a fan of 2 very long finger dumps beyond – the S dump is 38.5m long (bearing 279°), and the N dump which has 3 heads at variable distances is 40.5m long (bearing 301°), and there is a small, low irregular dump on the S side of the finger dumps; both finger dumps have remnant timber sleepers along the top and remnant upright timber posts along the upper edges (remains of tramway). There are few artefacts in the open area – only 1 piece of railway iron (not in situ) was noted. 	<ul style="list-style-type: none"> condition of underground workings unknown; entrance open; flooded beyond the portal and seeping water (acidic); associated finger dumps well preserved. 	<ul style="list-style-type: none"> high
Western Jig	pre-1950-51 (c.1937)	<ul style="list-style-type: none"> no clearly identifiable remains, but the jig is thought to have been located on or just below the NW corner of the platform (7m x 15m) to the NW of Adit 2 where the N and W edges have been contained by a timber barrier (now only partly evident) and there is an arrangement of timber beams in the ground on both levels which appear to have seated equipment or ore bins (the top arrangement is bolted with steel bolts and plates, and the timbers of the lower arrangement have upright metal spikes); there are also remnant wooden sleepers running in a line NW to the tailings finger dumps, and scattered surface artefacts (eg, metal sheet, metal fragments, timber fragments). No equipment survives (there are the remains of a car body, presumably more recent, on the NE edge of the platform), and there is 1 length of railway iron (not in situ) on the W edge of the platform. 	<ul style="list-style-type: none"> poor condition – no equipment survives on site, but there foundations for the jig and associated equipment partially survive in situ. 	<ul style="list-style-type: none"> Moderate-high
Tailings Area 2	c.1937 (possibly)	<ul style="list-style-type: none"> the tailings are spread out NW of Adit2 and W & NW of the jig platform across gently W sloping flats; disturbed drainage and mine seepage have made the area around the 	<ul style="list-style-type: none"> the tailings is largely intact but have been disturbed by the 	<ul style="list-style-type: none"> high

	earlier)	tailings slightly swampy. The area is accessed by a track (see <i>Track Main Shaft – Adit 2</i>), that originally accessed Adit 2 and the jig platform, but has later been modified (bulldozed) to access the tailings. The tailings comprises a flat to undulating approx. triangular area c.990m (E-W) x c.40m (N-S) which is N of, and abutting, the Adit 2 finger dumps. The tailings comprise an E-W line of low-medium irregular mounds of coarser crushed rock on the S side (possibly originally a finger dump that has been partly removed) and a higher area in the NE quarter which has a fan of c.6 short finger dumps at the NW edge, and a lower area of fine tailings beyond in the NW corner of the tailings area. The area appears to have had some bulldozing, with a line dozed between the finger dumps and S line of mounds, and another line bulldozed SW through the S part of the finger dumps (age unknown – probably late mining or post-mining). There is a sparse scatter of fragmented iron and timber across the full tailings area, and a concentrated scatter of fragmented objects – mainly gci sheet, other iron and timber on the N edge of the tailings just E of the finger dumps. This area included 1. a bottle base with a deep (rounded cone) kick up and 2. a hobnailed boot, both of probable late 1800s – early 1900s age, which suggests that Adit 2 or this area generally was used during the 1894-1902 period of mining.	cutting of water diversion channels in the NE and SE corners, and there has been some erosion across the tailings by water flow (from creek distributaries in high rainfall periods).	
Track from Main Shaft to Adit 2	c.1937	<ul style="list-style-type: none"> a c.11' wide benched formation which runs c.110m north from Adit 2 along the W edge of the hill, then turns E and runs c.70m (incl. N of the mill building) to connect with the main track from the Corinna Road to the mill and main shaft area; the track is benched and cut into the hillslope (cut is vertical and c.0.5-1m high) on the W side of the hill and for c.35m after it turns E. 	<ul style="list-style-type: none"> relatively well preserved (cuts and formation preserved) except at the NW corner where it is cut by a recent drainage diversion. 	<ul style="list-style-type: none"> high
Track to Watertank 1	nd	<ul style="list-style-type: none"> a track formation c.6' wide, formed through vegetation clearing (ie, no cutting or benching); runs from the track from Adit 2 to the Main Shaft SE (at c.109°) to the N end of the crest of the hill to the top of the mill, to the engine beds and Watertank 1. 	<ul style="list-style-type: none"> Well preserved, although possibly modified (enlarged) at the top (SE) end more recently 	<ul style="list-style-type: none"> moderate
Costean 1	1908-1922 or 1923-27	<ul style="list-style-type: none"> no evidence of this costean survives; originally dug E-W across the main hill. 	<ul style="list-style-type: none"> filled in historically 	<ul style="list-style-type: none"> low
Costean 2 (T5)	1923-27	<ul style="list-style-type: none"> the W part of this costean survives as a c.2'8" wide vertical sided trench to c.1' deep, running E-W across the main hill. 	<ul style="list-style-type: none"> distinct, but vegetated and the W end appears to have been water eroded (deeper & wider) 	<ul style="list-style-type: none"> low
Trenches W of main workings (T1)	1935-1936	<ul style="list-style-type: none"> narrow (1') and shallow c.1' deep cut across the slope then curving uphill; section inspected c.8-10m long; full extent unknown as difficult to trace 	<ul style="list-style-type: none"> well preserved in section inspected, but vegetated. 	<ul style="list-style-type: none"> low
Trenches W of main workings (T2-4)	1935-1936	<ul style="list-style-type: none"> 3 approx. parallel wider trenches on the W slope of the main hill just below the crest; trenches run E-W with openings on the W (lower) end; T2&3 are c.2'6"+wide, c.1-1.5m deep & c. 5-8m and have spoil mounds along one or both sides, and T4 is 1' 8" wide and 1' deep (but eroded? to a deeper channel on W side or deeper trench possibly original) & c. 5-8m. 	<ul style="list-style-type: none"> moderately preserved – vegetated and walls crumbling. 	<ul style="list-style-type: none"> low
SOUTHERN WORKINGS				
Adit 3	by 1936	<ul style="list-style-type: none"> the adit is cut into the W side of the low hill c.2-3m above the base of the slope; the open entrance section is well preserved, is 12' long x 3'4" wide & 6' deep at the portal, 	<ul style="list-style-type: none"> entrance open & well preserved, also just inside portal; associated 	<ul style="list-style-type: none"> moderate-high

		appears well preserved beyond the portal (and dry) with c.8m of tunnel on the same bearing & the tunnel then turning R (S) (underground workings not inspected); entrance has a c.4.5m wide bench with a single c.10m long (15m at base) finger dump running W off this.	finger dump well preserved; condition of underground workings unknown	
Adit 4	1894-1937? (pre 1952)	<ul style="list-style-type: none"> the adit is cut into the S side of the low hill c.1-2m above the base of the slope on a bearing of 42°; the open entrance is 7'6" long x 3'8" wide x 75cm high at the portal; beyond the portal the floor is flooded but the tunnel runs on similar bearing (there is some fill in the trench at the portal, but the original tunnel height is c.1.2m and the tunnel width near the base is 4'11"; a large trench (2' wide x 3' deep) runs N (307°) off the S end of the open entrance; to the SW and running W (290°) into the creek is a long 2 headed finger dump (c.27m long x 5m wide (on top) x c.2m above natural ground level) which has scattered medium eucalypts growing on the top. 	<ul style="list-style-type: none"> entrance moderately preserved (some collapse); flooded beyond portal with water (acidic) probable occasional seepage; associated finger dumps well preserved; condition of underground workings unknown 	<ul style="list-style-type: none"> probable high
Southern Adits – No. 1 Adit	1952	<ul style="list-style-type: none"> <i>not relocated</i> 	<ul style="list-style-type: none"> <i>not relocated</i> 	<ul style="list-style-type: none"> not assessed (probable low-mod)
Southern Adits – No. 2 Adit	1952	<ul style="list-style-type: none"> <i>not relocated</i> 	<ul style="list-style-type: none"> <i>not relocated</i> 	<ul style="list-style-type: none"> not assessed (probable low-mod)
Southern Shafts (1 & 2) (= S. Holes?)	?c.1913	<ul style="list-style-type: none"> <i>not relocated</i> 	<ul style="list-style-type: none"> <i>not relocated</i> 	<ul style="list-style-type: none"> not assessed (probable low-mod)
T6 & T7	by 1936	<ul style="list-style-type: none"> trenches 1' wide and c.1-1.5' deep – T6 runs across slope for 10m+ (bearing 175°) and appears to be crossed by Adit 3 (suggesting Adit 3 was located from this prospecting trench), then heads up slope at 90° for 1m; T7 – starts just above and offset from T6 and runs across slope for at least c.8m (not followed to S). 	<ul style="list-style-type: none"> well preserved 	<ul style="list-style-type: none"> low
T8	1894-1937? (pre 1952)	<ul style="list-style-type: none"> large trench which runs approx. W across slope from the W edge of Adit 4 for at least 15m (E end not located); c.3' wide x c.3' deep; has a significant spoil mound along the S (lower) edge; possibly the costean which determined the location of Adit 4. 	<ul style="list-style-type: none"> relatively well preserved (some crumbling of edges and large vegetation growing in trench) 	<ul style="list-style-type: none"> low-moderate
T9	1894-1937? (pre 1952)	<ul style="list-style-type: none"> a narrow trench cut across the low spur at the junction of Barnetts Ck and a tributary drainage; trench runs NW (325°) for 5m then W (325°) for 10m and is open at both ends, and is 2' wide x c.2-3' deep; has spoil mound on the SE edge. 	<ul style="list-style-type: none"> well preserved 	<ul style="list-style-type: none"> low
T10	1894-1937? (pre 1952)	<ul style="list-style-type: none"> short narrow trench cut W into hillside; 2' wide x c.2-3' deep x c.5m long; bearing 315°. 	<ul style="list-style-type: none"> well preserved 	<ul style="list-style-type: none"> low
costeans & trenches south of creek	? c.1913 & 1952	<ul style="list-style-type: none"> <i>not relocated</i> 	<ul style="list-style-type: none"> <i>not relocated</i> 	<ul style="list-style-type: none"> not assessed (probable low)

4 CULTURAL SIGNIFICANCE

The *Burra Charter* (Australia ICOMOS 1999) advocates a 'values based' approach to heritage management. This means that decisions about managing a heritage place, if significant, are based on attempting to preserve the significance of that place. As a consequence the assessment of cultural significance is central to cultural heritage management.

In the following assessment the definitions and aspects of cultural significance as set out in the *Burra Charter* (Australia ICOMOS 1999) are heavily relied upon. The *Burra Charter* defines the cultural significance of a place as the 'aesthetic, historic, scientific, social or spiritual value for past present or future generations', with cultural significance seen as being 'embodied in the place itself, its fabric, setting, use, associations, meanings, related places and related objects' (Australia ICOMOS 1999, 2). Aspects such as the representativeness and rarity of a place, seminal nature of a place, and its authenticity and integrity are also taken into account in assessing cultural significance.

An assessment of significance is based on all these components, but is made without reference to other factors such as owner/manager needs and aspirations, or available resources. These other factors are however crucially important in developing policy and advice for managing a place.

In the following assessment, the full Montana SL Mine (ie, the full extent of the historic mine workings as well as all periods of historic working) is considered.

General Review of Cultural Significance

The Montana SL Mine Site

The following explores the cultural heritage significance of the full Montana SL Mine as a single historic site:

The Montana SL Mine is not a large or high production mine in the context of the Zeehan Mineral Field, West Coast mining or Tasmania, and does not have historical significance in this respect. It is however considered to have high regional significance as a long lived mine (c.66 years) that operated over a large part of the life of the Zeehan Field (c.78 years). Although not one of the early mines, it started and operated for some years (ie, 1894-1902) during the peak period of the field (1882-1914), and was worked in the succeeding main periods of mining of the Zeehan Field (eg, possibly 1910s, early 1920s, late 1930s-early 1940s, and late 1940s to late 1950s), with intermittent exploration and tribute operations in between the main periods of operation. As such, the Montana SL Mine represents all but the earliest phase of mining on the Zeehan Field (ie, 1882-early 1890s), with the intermittent mining also typical of many of the mines of the Zeehan Field.

The Montana SL Mine can also be considered to have high historical significance at the regional level as one of the last historical mines to operate on the Zeehan Field. Only one other historical silver-lead mine, the Oceana to the south of Zeehan, is understood to have continued to operate through to the late 1950s. The Zeehan and Oceana Mines had comparable histories, although the Oceana Mine was a larger mine with significantly higher production (refer Table 2).

The Montana SL Mine is also considered to have high regional level scientific significance as a relatively well preserved (at the archaeological level) small-medium mine with an uncommonly wide range of types of features (ie., from mineral exploration features to underground workings and associated surface features, and ore processing features). There has been limited post-mining disturbance (which has all been for mine related purposes (ie, later mineral exploration and mine rehabilitation)). The only significant disturbance to the site has been to the mine buildings, and to a lesser extent to part of the collapsed stope area (including burial of one of the three shafts of this mine), the cutting of diversion drains around and through some of the mullock and tailings areas, and natural erosion of the tailings.

In addition there has been a very limited amount of overprinting of earlier workings by the later phases of mining which has meant that the earlier mine features are also well preserved. The mine is therefore able to demonstrate through its physical remains the evolution of small-medium mines, and also the mining and mineral exploration techniques used for much of the period of the Zeehan Field (ie, 1890s to 1950s), a period of over 60 years. The range of preserved mineral exploration features and their relation to the local geology and later mine works make the Montana SL Mine particularly well able to demonstrate exploration techniques and their application.

The scientific significance of the Montana SL Mine is enhanced by the relatively high integrity of the site. The relatively high integrity of the site derives from the relatively good preservation of almost all historical mining features, the lack of significant unrelated disturbance of the mine site and the preservation of its historical setting (although there now appears to be more swamp and eucalypt regrowth on the edge of the main workings). Because of the relatively good preservation of historic mine features, their layout and landscape setting, the mine site as a whole can be considered a good quality mine landscape (although its quality has been lessened somewhat by the large flat unvegetated areas resulting from mine rehabilitation and probable recent mineral exploration).

Mining heritage is generally not thought of as having aesthetic values, but aesthetic value may derive from iconic features such as headframes, from small well formed special features such as fanned finger dumps, and from aesthetic settings, or a combination of these. The Montana SL Mine is not considered to have major aesthetic value, but is considered to have some aesthetic value that derives from the well preserved finger dumps (both mullock and tailings), and the location of these well preserved features in an essentially natural, open heathland setting with a broad vista to the northwest across the landscape of the north part of the Zeehan Mineral Field, a landscape that is typical of the Zeehan area and broader West Coast.

The social values of the Montana SL Mine have not been assessed, but it is considered likely that the mine site is of some social significance to the local community as a local historical mining site and for its personal meanings and associations. The historical social value of the mine is likely to reside in it being one of the historic mines of the Zeehan Field and one of the longer lived and rare later mines. The personal meanings and associations are likely to be due to community members having family or friends who worked at the mine or who worked there themselves. This is particularly likely for the Montana SL Mine given its long history and the number of different mining lease holders, and given that the mine operated up until comparatively recent times (ie, .1960). The Montana SL Mine is not considered to have spiritual value.

The significance of the Montana SL Mine is considered to be primarily at the local and regional level, however the Montana SL Mine may have significance at the state level as a good representative example of a late 1800s to mid-1900s silver-lead-zinc type medium sized mine given its integrity, wide range of features, and the wide time period represented by the mine. This however is difficult to establish without more comprehensive assessment of other mines of this type in Tasmania more broadly.

Individual Features of the Montana SL Mine

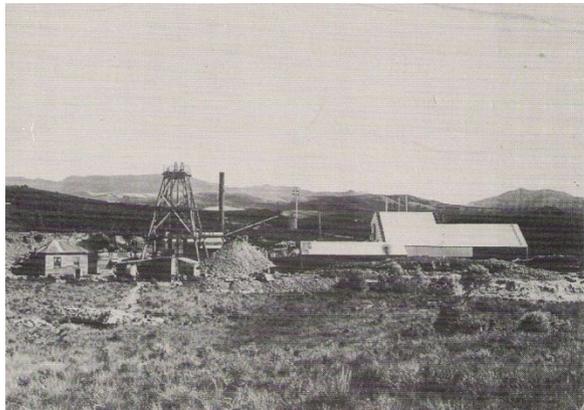
The cultural heritage significance of individual features has also been assessed (refer Table 1). In a number of cases however feature assessment is either not possible or is an indicative assessment due to insufficient information.

In assessing the significance of individual features, the range of Burra Charter values are used, but the assessment has focussed on the importance of that feature as a part of the full site in historical terms, how critical a component of the mine the feature was, and its present day scientific value (ie, ability to help interpret the mine's workings).

In general terms, the essential features such as the shafts and adits are seen as being of very high significance, particularly where well preserved. Core associated features which help tell the history of the mine, for example the mine buildings, mullock, tailings and connecting tracks, are also seen as of

high significance in relation to the mine, again particularly where well preserved. Activity areas such as the jig site or significant feature remains (eg, engine beds) are in general seen as being of moderate to high significance as although only archaeological remains, they are important in being able to interpret the working of the mine. Smaller features such as water tanks and non-function specific bed logs are seen as being of low-moderate significance. Minor features such as trenches and costeans are seen as being significant as they help interpret the initial prospecting history of the site, but are generally of low significance because they are common features at most mines and have low scientific values. Some trenches or costeans may have higher significance if they are of some historical importance (eg, if the trench was the one that located the first lode in the mine area).

Table 2 A comparison of the history and nature of the Montana SL Mine and the Oceana Mine (Information taken mainly from *The Zeehan El Dorado* (Howard 2006)).

MONTANA SL MINE	OCEANA MINE
<p><i>Location:</i> c.4km north of Zeehan</p> <p><i>Date of Mining Operations:</i> 1894-1902, 1923-27, 1935-1941, 1947-1958.</p> <p><i>Mineral production (total):</i> silver – 279,348 oz; lead – 2,304 tons, zinc – <i>no data</i></p> <p><i>Companies involved:</i> May Queen Prospecting Association, Extended North Silver Mining Co. NL, Western Extended Silver Mining Co. NL, Western Consolidated Silver Mining Co. NL, Montana Western Extended Silver Lead NL, Montana Silver Lead NL, and various tribute & prospecting parties.</p> <p><i>Nature of mine:</i> 1800s main shaft to 297' & underlay shaft to c.60', 1 later prospecting shaft & 2 later main adits, two milling units (c.1900 jig and 1951 mill).</p> <p><i>Location ore smelting:</i> <i>no data.</i></p>	<p><i>Location:</i> c.3km south of Zeehan</p> <p><i>Date of Mining Operations:</i> 1892-93, 1896-99, c.1949-1960</p> <p><i>Mineral production (total):</i> silver – 641,981 oz; lead – 14,902 tons, zinc – 12.8 tons (Note - c.95% of production occurred in 1954-60).</p> <p><i>Companies involved:</i> Oceana Silver Mining Co., Oceana Propriety Co. Ltd., Zeehan Mines Pty Ltd.</p> <p><i>Nature of mine:</i> 1800s main shaft to 145', 1950s main shaft (circular concrete) to 648' (worked on 6 levels), ore processing (mill), 2' gauge railway (later tramway).</p> <p><i>Location ore smelting:</i> Argenton (by rail) in 1892-93.</p>
	

Summary Statement of Cultural Significance

The Montana SL Mine is considered to be of high regional level cultural heritage significance as a long lived and relatively well preserved small-medium silver-lead-zinc mine on the Zeehan Mineral Field. It is primarily of historical significance since it operated throughout most of the period of the Zeehan Field and is one of the few late period (ie, late 1940s-1950s) mines of the area. It also has high scientific significance given the good preservation (as archaeological remains) of its uncommonly wide range of types of features (ie, relating to ore processing as well as to mining and mineral exploration) that span from the height of mining on the Zeehan Field (ie, the 1890s) to its latest phase (c.1950s), with minimal overprinting of earlier features. The Montana SL Mine also has relatively high integrity given the comparative lack of post-mining development of the site and the consequent relatively good preservation of almost all historical mining features and the preservation of the mine's historical setting.

Although not formally assessed, the Montana SL Mine is considered to have probable local social significance deriving from it being a long lived mine and from personal meanings and associations due to it being operated up until c.1960. The Montana SL Mine is also considered to have some aesthetic significance which derives from the preservation of small scale, fine or complex features such as the isolated finger dumps and finger dump fans, and their setting in an essentially natural, open buttongrass heathland.

The Montana SL Mine, although a rare late period mine in the context of the Zeehan field, is not generally a rare type of mine. It is however considered a good representative example of a late 1800s to mid-1900s silver-lead-zinc type, medium sized mine. It potentially has state level significance as a representative example of its type.

Significance Against Tasmanian Heritage Register Criteria

Given that the Montana SL Mine is assessed as having high local/regional level significance and potential significance at the state level, the following provides an assessment of the Montana SL Mine against the criteria for listing on the Tasmanian Heritage Register as set out in the *Historical Cultural Heritage Act 1995*¹³, as well in relation to aesthetic and landscape value (which are not specifically included in the *Historical Cultural Heritage Act 1995*), as these are the criterion most commonly used for statutory registers. The assessment also indicates whether individual criteria apply at a local and/or state level.

a) Importance in demonstrating the evolution or pattern of Tasmania's history

The Montana SL Mine is of historical cultural heritage significance as a long lived mine of the Zeehan Field, operating from the middle of the key (and earliest) phase of mining to the last days of historical mining on the Field. Although it operated intermittently it had four main phases of mining and retains the evidence of all these phases as well as some intermediate prospecting. [Local]

b) Demonstrates rare, uncommon or endangered aspects of Tasmania's heritage

The Montana SL Mine has historical cultural heritage significance as one of the few historic mines of the Zeehan Field that operated into the 1950s and which has well preserved archaeological evidence of this phase of mining. [Local].

c) Has potential to yield information that will contribute to an understanding of Tasmania's history.

The Montana SL Mine is of historical cultural heritage significance because its relatively well preserved features comprise a wide range of mining type features (ie, relating to ore processing as well as to mining and mineral exploration) and span a significant period of the historic mining of the Zeehan Mineral Field and Tasmanian mining history more generally (ie, early-mid 1890s to c.1960) [Local].

¹³ *Recent amendments to the Historical Cultural Heritage Act 1995 have not been implemented at the time of writing.*

d) Importance as a representative in demonstrating the characteristics of a broader class of cultural places

The Montana SL Mine is good representative example of an historic small-medium silver-lead-zinc mine given its complexity and relatively high integrity. It contains a wide range of relatively well preserved mining features that span from the 1890s to 1950s in a relatively undisturbed (except through mining) landscape setting. As such it is considered to have high historical cultural heritage significance. [Local, and probable State].

e) Importance in demonstrating a high degree of creative or technical achievement.

The Montana Mine Site is not considered to have particular significance in relation to this criterion (although it is considered slightly unusual in having an underground ore bypass).

f) Has strong or special meaning for any group or community because of social, cultural or spiritual associations

The Montana Mine Site has not been formally assessed with respect to social value, but it is considered likely to have some social value. [Local]

g) Has a special association with the life or work of a person, a group or an organisation that was important in Tasmania's history.

The Montana Mine Site is not considered to have particular significance in relation to this criterion.

Aesthetic importance (nb: this is not currently a THR criterion)

The Montana SL Mine has some historical cultural heritage significance which derives from the aesthetic quality of some of its well preserved, small scale, detailed features such as the finger dumps and their contrasting location in an essentially natural, open heathland setting, which is a quintessentially West Coast environment. [Local]

5 MANAGEMENT CONTEXT

General Management

The Montana SL Mine is located on unallocated Crown land that is managed by the Parks and Wildlife Service. The mine is abandoned.

Previous Heritage Studies

No previous heritage studies of the Montana SL Mine, or parts of the mine, or of nearby mine sites are known.

There have been no broad based regional mining heritage studies or broader heritage studies undertaken that include the Zeehan area. As a consequence the Montana SL Mine appears not to have been identified in any previous heritage studies.

Heritage Status

The Montana SL Mine is not listed on any local, State or national statutory heritage registers (eg, the West Coast Planning Scheme Heritage Schedule (ie, Table 19.1, Items and Places of Heritage Significance), Tasmanian Heritage Register, National Heritage List and Commonwealth Heritage List).¹⁴

The status of the Montana SL Mine in relation to Aboriginal and natural heritage values is not discussed here as this is not within the scope of the assessment.

Heritage Legislative & Policy Context

The following outlines the main legislative, policy and other statutory and non-statutory (but commonly accepted) frameworks for historic heritage assessment and management likely to apply, or potentially apply, to the Montana SL Mine site.

Legislation

The *Historic Cultural Heritage Act 1995* is the primary Act relating to historic cultural heritage in Tasmania and is administered by Heritage Tasmania and the Tasmanian Heritage Council. Under the Act heritage protection is required only for places assessed as being of State level significance (according to set criteria) and listed on the Tasmanian Heritage Register (THR). The Act operates to ensure that the cultural heritage significance of listed places is not diminished through use or works. As the Montana SL Mine is not currently listed on the THR, the standard protective provisions of the *Historic Cultural Heritage Act 1995* do not apply.

It should be noted that under the provisions of Part 6 of the Act, a listed, unassessed site can be granted temporary protection by declaring it a 'heritage area'; or under Part 8 of the Act the Tasmanian Heritage Council can issue a stop work order if it is believed that a development or works (including for example potentially damaging remediation works) would affect an unregistered historic place considered to have State level significance as defined under the *Historic Cultural Heritage Act 1995*.

Protection for historic heritage may also occur at the Federal level through the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999 (& 2003 (Heritage) Amendments)*. In relation to cultural heritage, this Act mainly applies in cases where an historic heritage place is listed on the National Heritage List or Commonwealth Heritage List, or is considered to be of national level significance and at risk. This Act does not apply, and is not likely to apply, in relation to the Montana SL

¹⁴ The Montana SL Mine is also not listed on the Register of the National Estate, but this Register no longer has statutory powers.

Mine as the mine site is not considered to have national level heritage significance and is not Commonwealth owned or controlled.

Statutory Planning

The main statutory regulations that apply to cultural heritage in the study area are those contained in the *West Coast Planning Scheme* (West Coast Council). The *West Coast Planning Scheme* provides planning direction and control for the West Coast Municipality under the *Land Use Planning and Approval Act 1993* and has as its primary objective 'to achieve sustainable use and development of resources in the planning scheme area'. It provides for environmental protection through zoning and schedules (termed 'Codes').

Historic heritage protection is provided for in Schedule 19.1 - 'Items and Places of Heritage Significance'. If a place is listed in the schedule then it must be managed in accordance with the planning scheme's 'Heritage Code'. This applies regardless of the broader Scheme zoning. It should be noted however that places or areas of heritage value not listed in Schedule 19.1 are also subject to the Heritage Code.

The Montana SL Mine falls within the Natural Resources Zone of the West Coast Planning Scheme. The intent of the Natural Resources Zone is to protect and allow for the sustainable use and development of existing key resource uses, as well as for new uses 'that do not adversely affect the values of the zone'. The planning objectives for this zone reflect the intent, but also include a conservation objective (objective e) which is to "maintain the scenic, historic and cultural values of the zone" (WCPS, item 9.4.1 (e)).

The *West Coast Planning Scheme* takes its direction in relation to the treatment of cultural heritage from Schedule 1, Part 2 of the *Land Use and Planning Approvals Act 1993* which sets out the objectives of the Act, and specifically from objective (g) which in relation to historic heritage is "to conserve those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest, or otherwise of special cultural value".

Policy

No state or other major policy that relates to historic cultural heritage management is known to apply to the Montana SL Mine or environs.

Guidelines

In Australia, including in Tasmania, the main guideline for cultural heritage that is used is the *Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia ICOMOS 1999). The *Burra Charter* has been in place since the late 1980s and has been adopted broadly by government in Australia as a standard for cultural heritage management.

Most importantly the *Burra Charter* provides a process for considering cultural heritage (refer Figure 3) and a number of important principles.

Key *Burra Charter* principles include -

- 'significant cultural heritage should be conserved' (article 2.1),
- 'the aim of conservation is to retain cultural significance' (article 2.2)
- 'places of cultural significance should be safeguarded and not put at risk or left in a vulnerable state' (article 2.4),
- 'significant associations and meanings of a place (including spiritual values) should be respected (articles 24.1 & 24.2),
- 'the policy for managing a place must be based on an understanding of its cultural significance' (article 6.2), and
- 'conservation should make use of all the knowledge, skills and disciplines which can contribute to the care of the place' (article 4.1).

6 MANAGEMENT ADVICE

6.1 General Management Advice

Obligations for Management

There is no previous heritage management to be taken into account in relation to the Montana SL mine, and as the Montana SL Mine is not listed on any statutory heritage register or in any list there are no direct statutory obligations in relation to its heritage values.

However, given that the Montana SL Mine has been assessed as having high local/regional cultural heritage significance and potential state level significance (refer Section 4), then there is a general obligation under generally accepted cultural heritage guidelines such as the *Burra Charter* (Australia ICOMOS 1999) and given the intent and objectives of legislation such as the *Land Use Planning and Approval Act 1993* (Schedule 2) and the *Historic Cultural Heritage Act 1995* to manage the Montana SL Mine site in such a way as to retain the significance of the site (ie, to conserve the Montana SL Mine site). This obligation is based on historic heritage being a non-renewable resource.

The extent to which the Montana SL Mine site can be conserved will dependent on a range of factors, such as other important uses, other environmental considerations, and safety and resourcing. The long term management of the mine site should be based on development of a conservation policy which takes both the cultural heritage significance and these other factors into account.

This however is beyond the scope of the present assessment, and the present assessment restricts itself to providing advice on how to best conserve (ie, retain the significance of) the Montana SL Mine at a general level (below, this section), and also in relation to environmental remediation and safety arising from the existence of the mine (Section 6.2). Section 6.3 provides some comment on the potential of the Montana SL Mine for interpretation, and potential issues and opportunities with respect to this.

General Conservation Advice

The following advice is strongly based on the Burra Charter principles, but is designed to apply specifically to the Montana SL Mine.

1. Definition of Site

Given the significance of the Montana SL Mine, then the Montana SL Mine site (ie, the area to be considered in the conservation of the heritage values) should be the full area of the site (ie, a contiguous area which includes the northern and southern workings as well as the main area of the site) and the immediate setting.

2. General Conservation

Given the significance of the Montana SL Mine, then for the conservation of the site it is desirable to retain all extant historic site features and structures and their setting, and the broader setting (ie, the nearer area of buttongrass plains in which the mine sits). These elements should be retained in their current condition, although their restoration (where relevant) would enhance the significance of the site. The significance of the site could also be enhanced by revegetating the areas of recent disturbance (through 2004-05 rehabilitation works and mineral exploration works) that are currently unvegetated.

3. Intervention at the Site

Intervention at the site for any reason, but including cultural heritage conservation, should do as much as is required, but change the site as little as possible. Where intervention occurs, where possible this should be reversible without additional disturbance of the site or its features.

4. General Treatment of the Site

- Movement of the site features and artefacts, removal of the site features (or parts of such) and artefacts, flattening or otherwise modifying historic earth features, burying features, excavating features (or parts of features) and the introduction of new (in particular unrelated features and structures) all constitute impacts and should be avoided. Where this is not possible, such disturbance should be kept to the minimum possible.
- Associated works (eg, such track building to access parts of the site, equipment storage, using heavy equipment, construction of interpretation infrastructure) can potentially impact on the site and site features, and should also therefore be avoided or minimised. This can be achieved to a large degree by keeping these works off historic features, especially significant and well preserved features, and where possible keeping the works outside the main site area.
- Intervention should where possible avoid intact or otherwise well preserved features.
- All intervention and change should be documented to enable the history of the site to be fully understood.

5. Major Change

Where it is proposed to re-use the site for mineral exploration, mining or some other purpose, then conservation of the historical cultural heritage values of the site should be managed through a heritage conservation management policy for the site. Such a policy should be prepared by a heritage expert.

6.2 Rehabilitation

The current assessment has been undertaken primarily to assist conserve the historic heritage values of the sites in relation to essential mine rehabilitation work. The mine rehabilitation is aimed at environmental remediation given the acid drainage and disturbed drainage, and also at human safety given the ease of access to the site and its high visibility.

The following advice is provided to assist conserve the historic heritage values of the site in relation to essential mine rehabilitation work. It is discussed under 'environmental remediation' and 'safety'.

Environmental Remediation

Environmental issues identified through the heritage survey

The following have been identified as possible environmental issues through the heritage survey. There may be other issues not identified below.

- possible acid mine drainage (minor) from Syds Cut Adit in the northern workings.
- acid mine drainage (significant) from the main shaft in the central workings [identified by MRT, and some remediation in 2004-05],
- probable acid mine drainage (moderate) from Adit 2 in the central workings,
- water flow across Tailings Area 1 in the central workings [partly remediated by MRT in 2004-05],
- water flow across Tailings Area 2 in the central workings, and
- probable acid mine drainage (minor) from Adit 4 in the southern workings.

There are a number of large trenches (cuts) in the area of the northern workings and on the west side of the hill crest, and there are possibly others in the southern workings area. These do not appear to be eroding significantly, and are therefore not included as environmental issues. As most of these (except possibly those near the northern workings) have historical significance these cuts should be left as are and not filled in unless they are creating a significant erosion issue.

Remediation and heritage conservation

The following advice is provided in relation to the Montana SL Mine. The advice is generally aimed at avoiding impacts to the historic workings where possible, based on the assessment of the Montana SL Mine as being of high local significance for historical reasons and as a representative site, and also the mine site's high potential for interpretation.

- **Adit & shaft acid mine water seepage:**

1. If it is considered possible to stop the drainage by blocking the adits, then the blocking of the adits should occur inside the portal so that the adit entrance location and nature is still evident and interpretable, and the same general considerations as in 2., below, should be observed.
2. Drainage channels should be kept to the minimum size necessary to effectively drain the site, and care should be taken to damage the associated features (eg, benches, mullock heaps, tracks) as little as possible, especially where these are well formed and well preserved and important in interpreting the history of the mine (for example the finger dumps and track and jig platform associated with Adit 2).
3. Any additional acid mine drainage control features (eg, dams, filters) should be located away from the historic workings and be designed to be as minimally intrusive (on features, the site and visually) as possible.
4. In all of the above, care should be taken to avoid or minimise impacts to the historic features through associated works such as getting vehicles to the works site.

- **Mullock & tailings:** It is understood that the key approaches to controlling acid mine drainage on the tailings dumps, and to a lesser extent in areas of mullock, is to keep water off the features or constrain/guide water flow across the features. In these cases –

1. The preferred option where possible is to divert water around the outside of these features in order to leave them undisturbed.
2. Where water flow needs to be controlled across such features, then channels and levees, etc, should be kept to the minimum and to the minimum size necessary to work effectively.
3. Intervention on mullock and tailings should be preferentially located in already disturbed areas to the extent possible.
4. Except where mullock and tailings are already significantly disturbed (eg, in the flat and low hummocky excavated area of mullock to the north of the main shaft) then levees and other drainage control should not be achieved by modifying the surface of the tailings or mullock (ie, should not be bulldozed up). Where earthen barriers are required these should be formed from excavated channel material or imported fill to avoid impacting the site and so the new work can be distinguished from the historic works.
5. Where containment features and filters are required these should be preferable located off the tailings and mullock (see Adits & Shafts, above). If it is considered necessary to spread lime across tailings or mullock, it would be preferable to leave one area of coarse and fine tailings untreated so that this can be interpreted. The lime should be spread without modifying the surface of the tailings or mullock.

- **Existing remediation issues:** Some of the remediation carried out in 2004-05 has negatively impacted on the historic heritage. While some matters cannot be redressed, the following actions should be considered to partly restore the heritage values, in particular for interpretation –

1. If time and resources allow, the excavated channel that runs from the main shaft northeast through the northeast mullock (which does not appear to be particularly effective at draining water from the main shaft) should be filled in and a new drainage channel excavated from the main shaft eastwards, but south of the mullock. There may be building foundations in this area, and if building remains are noted in the excavation these should be recorded.

- **Associated Activities:** It is important to avoid disturbing the historical features of the mine, and the mine site generally, through adjunct activities such as getting the equipment used for remediation to the works sites, and through associated activities such as sampling and monitoring. To limit such impacts –
 1. The use of equipment on historic features should be kept to a minimum.
 2. Existing tracks and other recently disturbed areas should be used to the extent possible, and the bulldozing of new tracks should be avoided. Where equipment needs to go into untracked areas, then it is preferable to ‘walk’ the equipment in without creating new bulldozed tracks, or if tracks are essential, they should be kept to a minimum and rehabilitated after use if they will not be needed again.
 3. Sampling for remediation (and other sampling) should be kept to a minimum, to a minimum size and, where possible, avoid well preserved and significant features, and be covered in afterwards.

Safety

Safety issues identified through the heritage survey

The following have been identified as probable significant human safety issues through the heritage survey (and there may be other safety issues not identified below) –

- **The collapsed stope area on the crest of the hill in the central workings:** Collapsed stope areas 1, 3 and 5 are seen as posing the greatest safety risk as they each have vertical (or near vertical) openings that may be of some depth (collapsed stope area 3 includes the c.42’ deep No.2 Prospecting Shaft).
- **Fragmented asbestos sheet:** This is centred on the small concrete floored area off the west side of the mill building (note - this is concentrated in the one area and does not appear to be being moved around the site).

The main shaft is capped with a concrete slab (and is filled with water), and is therefore not considered to constitute a safety issue. The adits with pooled water on the floor are also not noted above as they are also not seen as posing a significant safety hazard. Adit 3 is understood not to have vertical components, but has not been checked to verify this. The main adits (Adit 1 and Adit 2), both of which have vertical workings have both been blocked, but how effective the blocking is, is not clear.

Safety and heritage conservation

- **Adits:** If any of the adits are considered to be unsafe, then the preferred approaches from a heritage perspective are to –
 1. block the adit – which should be done by blocking the adit inside the portal so that the adit entrance location and nature are still evident and interpretable; or
 2. gating the adit – either at, or inside, the portal.
- **No.1 Prospecting Shaft:** The 2004-05 remediation work infilled and covered over the No.1 Prospecting Shaft. For safety reasons and for future interpretation purposes consideration should be given to marking the location of this prospecting shaft at the surface.
- **Collapsed Stope Area:** The preferred approach from a heritage perspective to mitigate safety issues in the area of collapsed stoping is to fence the area rather than fill it in, to allow this area to be interpreted. If this is considered not possible for various reasons, then Collapsed Stope Area 3 should be left as is if possible and fenced, as this contains the opening to the No.2 Prospecting Shaft, and it is highly desirable to leave one collapse area open for interpretation, as the underground workings involved considerable stoping.

- **Asbestos:** Given the significant health issues from asbestos, and given that the fragmented asbestos sheet does not contribute significantly to the site's significance, the asbestos sheet can be removed. The nature of the accumulation means that the asbestos can be removed by hand and no heavy equipment will be needed.
- **Treatment for lesser safety issues:** In general only significant safety issues in relation to historic features should be addressed by high impact and/or high cost works such as covering, infilling, gating and fencing. For minor safety issues it is preferable from a heritage perspective to use less costly, damaging and intrusive approaches, such as warning signs.
- **Associated activities:** As with remediation, it is important to avoid disturbing the historical features of the mine and the mine site generally through adjunct activities such as getting equipment to the works sites. To limit such impacts –
 1. The use of equipment on historic features should be kept to a minimum.
 2. Existing tracks and other recently disturbed areas should be used to the extent possible, and the bulldozing of new tracks should be avoided. Where equipment needs to go into untracked areas, then it is preferable to 'walk' the equipment in without creating new bulldozed tracks, or if tracks are essential, they should be kept to a minimum and rehabilitated after use if they will not be needed again.

6.3 Interpretation

As a relatively well preserved historic mining site that has a wide range of historic mining features related to underground mining and processing, as well as representing workings from the early mining period (late 1800s – early 1900s) as well as mid-1900s mining which was much more mechanised, the Montana SL Mine is considered to have high potential for interpreting small-medium scale historic mines of the Zeehan Field. Its potential is enhanced by it being a relatively rare historic late period mine.

Its potential is further enhanced by the ease of access to the site and the nature of site's setting. The site is less than 200m from the main Zeehan - Corinna Road and can be easily walked from the main road or can be driven in a 2WD vehicle. The existing track network provides access to all key features of the central workings, therefore no new infrastructure would need to be built to interpret the main workings. The fact that the main works are located on and around a low hill, combined with the location of the mine in relatively open terrain, means that many of the features can be easily seen (and interpreted) from the crest of the hill, and most historic features of the main workings are easily seen from the ground.

The following general advice is provided in relation to presenting and interpreting the Montana SL Mine Site to visitors.

1. The main workings (central part of site) can be interpreted at two levels –
 - i. it can be easily interpreted for the existing level of visitation with minimal infrastructure and works through an explanatory sign (with map of site, image/s and brief descriptive text) in the main shaft area (in car park area); or
 - ii. it can be more actively promoted and comprehensively interpreted to visitors to the area through suite of signs and route marking for wayfinding. For example a site name sign could be placed on the side of the Zeehan -Corinna Road and explanatory signs placed in the main shaft area (in car park area) and on the hill crest (where visitors can look out on the features on the western side). This would also need some route marking from the car park up the existing track to the crest of the hill to the second sign. Better interpretation could be achieved by additional signs at major features (eg, the mill, jig site, adits and tailings, and main connecting track), with additional route marking along the historic track between the main shaft and Adit 2.

2. The main workings (and full site more generally) is considered to be highly interpretable without reconstructing any site elements or structures, although a clear path through the buildings area (without disturbing features) might be desirable.
3. While it is desirable to also allow visitors to view the northern and southern workings, these are much less accessible, and will probably require the construction of tracks to the key areas, hence more investment by MRT (for establishing tracks and maintaining them in the long term).
4. In presenting the site, there are safety issues (eg, collapsed stoping) that need to be considered – refer Section 6.2.
5. In interpreting the site there are general management and heritage conservation issues which need to be borne in mind (refer Section 6.1).
6. A related issue is the introduction of new visitor infrastructure. In general, visitor infrastructure (eg, paths, walkways, viewing platforms, toilets, picnic shelters) are all intrusive elements and should be avoided where possible and, where considered necessary or highly desirable, they should be –
 - kept to a minimum,
 - be located off heritage features,
 - be located and designed (eg, through materials, style and finish) to have minimal visual intrusion,
 - be designed (eg, through materials, style and finish) to be sympathetic to the historical nature of the site, and
 - be regularly inspected and maintained.
7. If site visitation levels are likely to be high, and if resources are available, presentation of the site would be improved by replacing the concrete cap on the main shaft with a safe, more open cap (eg, a metal grid style capping or cover) to allow the collar and shaft to be viewed (although this is of limited benefit at the Montana SL Mine since the shaft is filled with water). If the cap is replaced, then care needs to be taken not to damage (or further damage) the collar of the shaft, and any preserved in-shaft features.

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- . Mineral Lease Charts: Aug 1888 – Feb 1963.
- . Mineral Lease Survey Plans – miscellaneous.
- . 706/50 (also 9-706) – *Plan Showing Workings & Lodes – May Queen Area, North Zeehan*, F. Blake, June 1936.
- . 706/50- 126 (also 9-706) – *Plan Showing Underground Workings & Lodes – Montana Western Extended Mine, Zeehan*, F. Blake, Oct 1938.
- . 1218-50 – *Montana Silver-Lead Mine*, Taylor, B.L. & Burger, D., 16 Nov 1951, Dept of Mines, Tasmania.
- . 1901-50 – *Montana Silver-Lead Mine General Plan*, Blissett, A.H. (after Taylor, B.L. & Burger, D. 1951, 52, 53), 1961, Dept of Mines, Tasmania.

Images

- . c.1938 – Montana Silver Lead Mine (L.J. (Les) Morley)
- . 1950s – Montana Silver Lead Mine (L.J. (Les) Morley)
- . 1964 – Montana Silver Lead Mine, Main workings & mill area (Greg Dickens).
- . 1970 – Montana Silver Lead Mine, Mill ruins (Greg Dickens).
- . 1970 – Montana Silver Lead Mine, Main workings & mill area (Greg Dickens).
- . 1998 (April) – Montana Silver Lead Mine, Main shaft, recent cap (Greg Dickens).
- . 1998 (April) – Montana Silver Lead Mine, Mill site (Greg Dickens).
- . 1998 (April) – Montana Silver Lead Mine, Collapsed stope area (Greg Dickens).

Published & Other Archival Maps & Plans

- . Pieman (7914) 1:100,000 topographic (land tenure) map (1984) [TASMAP, Hobart]
- . Heemskirk (3436) 1:25,000 topographic map (1986) [TASMAP, Hobart]
- . Dundas (3636) 1:25,000 topographic map (1986) [TASMAP, Hobart]

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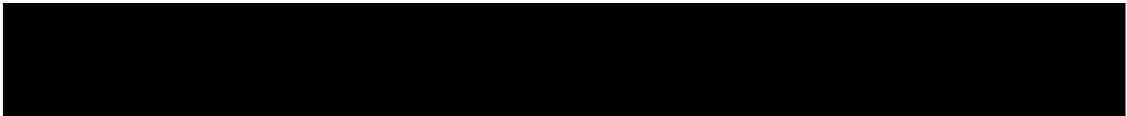
Tasmanian Heritage Register - online March 2013.

GLOSSARY

associations	—	the special connections that exist between people and a place (and which may include social or spiritual values and cultural responsibilities for a place) (<i>Burra Charter</i> , 1999, 3).
authenticity	—	the ability of a place (or object) to provide knowledge and understanding of original and subsequent characteristics of the place from all sources of information (including meanings) (<i>Nara Document on Authenticity</i> , cited in Lennon 2002).
community	—	the public in general or in some cases (generally qualified) a particular group of people that have interests in common (<i>TWWHA Management Plan</i> 1999, 206). Two types of 'community' are generally recognised: 1. the <i>local community</i> – which is the community of a specific geographic locality; and 2. a <i>defined community</i> (or community of interest) – which is a community defined by its shared interest (eg, culture, beliefs, ethnicity, activity or experience) (Terry 2002)
compatible (use)	—	respects the cultural significance of a place (a compatible use involves no, or minimal impact on cultural significance) (<i>Burra Charter</i> , 1999, 2).
conservation	—	all the processes of looking after a place so as to retain its cultural and natural significance (<i>Burra Charter</i> , 1999, 2) (<i>Australian Natural Heritage Charter</i> 1996, 8)
conservation management plan	—	a document which details how to look after the values of a place which has natural and/or cultural significance.
cultural significance	—	aesthetic, historic, scientific, social or spiritual value for past, present or future generations; and which is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects (<i>Burra Charter</i> , 1999, 2)
fabric	—	all the physical material of a place, including components, fixtures, contents and objects (<i>Burra Charter</i> , 1999, 2).
heritage	—	a <i>value</i> that derives from the past (ie, is inherited or transmitted from the past), and may include cultural practices and traditions.
historic heritage	—	a <i>value</i> that is inherited or transmitted from the non-Aboriginal past; may include cultural practices and traditions.
integrity (cultural)	—	the extent to which the layered historic evidence, meanings and relationships between elements remains intact and can be interpreted (and in relation to cultural landscapes it is also the integrity of the relationship with nature that matters, not the integrity of nature itself) (Lennon 2002, 56).
maintenance (cultural)	—	continuous protective care of the fabric and setting of a place (to be distinguished from repair) (<i>Burra Charter</i> , 1999, 2) or its values.
meanings	—	that which a place signifies, indicates, evokes or expresses (and which generally relate to intangible aspects such as symbolic qualities and memories) (<i>Burra Charter</i> , 1999, 3).

monitoring	—	ongoing review, evaluation and assessment to detect changes in condition, with reference to a baseline condition.
preservation (cultural)	—	maintaining the fabric of a place in its existing state and retarding deterioration (<i>Burra Charter</i> , 1999, 2).
protect	—	to keep safe from danger or degradation.
reconstruction	—	returning a place to a known earlier state (and is distinguished from restoration by the introduction of new material into the fabric) (<i>Burra Charter</i> , 1999, 2)
related place/object	—	place/object that contributes to the cultural significance of a place/object but is not at the same place (<i>Burra Charter</i> , 1999, 3).
repair (cultural)	—	return of fabric or values to closer to its original state; involves restoration or reconstruction.
restoration (cultural)	—	returning the existing fabric of a place to a known earlier state by removing accretions or reassembling existing components without the introduction of new material (<i>Burra Charter</i> , 1999, 2).
significance (general)	—	quality of having value (may be intrinsic value or attributed value).
value	—	physical or non-physical attribute of a place that has value or is valued at any level.

Appendices



Appendix 1

MONTANA SL MINE HISTORICAL TIME LINE DATA

(Summary of all identified historical information for the Montana SL Mine (sources identified in the text, and referenced in the main report, Section 6)

DATE	CONSTRUCTION /CHANGE
MONTANA SL MINE	
1888	Start of prospecting in the north Zeehan area; by J.J Martin, J. Adams, W. McLoughlin, J. Clarke and others (Geol Survey 1962, 212)
1891	First mining lease (769/91M, 80ac) taken out by G.C. Robinson (G. Dickens research)
1894-1896	A 40ac mining lease (2116-91M) taken out by the May Queen Prospecting Association NL under the name of J.L. Mace, Zeehan) (this is part of G.C. Robinson's 1891 80ac lease) (G. Dickens research) During this period a 15' underlay shaft is sunk, also a 9' deep pit is sunk [later main shaft?] (G. Dickens research)
1896-1902	The 40ac mining lease (2116-91M) is transferred a number of times – <ul style="list-style-type: none"> ▪ initially to W. Jenkyn in Aug 1896; ▪ to the Western Extended North Silver Mining Co. NL in Dec 1896; ▪ to H.S.M. Evans in Aug 1898; ▪ to the Western Extended Silver Mining Co. NL in Nov 1898; ▪ to Western Consolidated Silver Mines. NL in Oct 1900, falling void in Dec 1902 (G. Dickens research)
1896-1898	The Western Extended North Silver Mining Co. NL sank a shaft [main shaft?] to 160' (Twelvetrees 1900)
1898-1902	1896-1908 – UR 1951/113-161 notes that no mining occurred at the Montana SL Mine in this period – <i>but this appears to be incorrect with works being described by others in 1896-1898 and probably 1900-1902 (see below)</i> ; 1898-1902 - Waller (1904, 53) notes no work done on this main lease (although northern leases also held); notes work in the main lease as the sinking of a main shaft with a crosscut at 160', with stoping to the surface; and a winze sunk to about 60' with associated stoping; notes the two main lodes as being termed Colemans lode and Morris' lode.; 1900-1902 - Waller (1904,53) notes that the Western Consolidated Co. owned a concentrating mill [does not describe its location]
1904	Report notes that the 'whole ground of the Montana SL Mine is vacant at this time (Waller 1904)
1907-1908	The same 40ac mining lease area (2116-91M) is taken out as lease 2889M by R. Clabburn from Jan 1907 to Dec 1908 (G. Dickens research)
1913	Tasmanian Government prospecting in area (2,000+ feet of trenches cut and several shallow (c.7') shafts sunk (Geol Survey 1962, 212) – <i>some of the adits, shafts & trenches in the southern area, and some of the trenches in the main area possibly excavated at this period.</i>
1920s-1930s	The Tasmanian Government assisted with the prospecting that led to the Montana SL Mine operations (MRT 89-3014, 593011) - <i>some of the adits, shafts & trenches in the southern area, and some of the trenches in the main area possibly excavated at this period (or 1913).</i>
pre1926	Lease 8947M (40ac) – worked by the May Queen Syndicate 'under the leadership of J. O'Neil – commenced sinking a large shaft, but work ceased at 10' (MRT UR 1926/217-221, 220). Near 'NE corner of the lease on the left bank of a small creek' [northern workings?] P. Jones and party sank a 35' shaft, also a trench 5 chns NE (part of the fissure veins 'known as Barnett's') (MRT UR 1926/217-221, 220); location known as Jones Prospect (MRT Deposit Details).
1923-1927	Lease 8947 (40ac) [later mainly lease 11789] held by R. Clarke from Jan 1923 to Dec 1924 (R. Clarke or R. Clarke & others also have the leases to the west and south (W - 8912M (20ac), SW-8909M (40ac), 8948M (40ac)); plan shows a tramway in the NE corner (shown on later maps as the Main Corinna – Zeehan road, or possibly the tramway is separate?) with an old track [Stanley River

	<p>Track?] above it (Montagu 104/20 plan, 1923).</p> <p>The 40ac mining lease area (2116-91M) is taken out as lease 9652M by R. Clarke from Mar 1926 to Mar 1927 (G. Dickens research)</p> <p>During 1923-24 and 1926-27 – GWS. Clark carried out the following work –</p> <ul style="list-style-type: none"> ▪ widening and deepening of the May Queen prospecting pit [No.1 Prospecting Pit?] ▪ cutting of a costean from this pit [No. 1 Costean?] (filled in by 1951) ▪ cutting of No. 2 costean south of what is now No. 1 Prospecting pit (underlay shaft) (MRT UR 1951/113-161).
1935-1937	<p>During 1935 to 1937 – prospecting party led by GWS. Clark carried out the following works –</p> <ul style="list-style-type: none"> ▪ sinking of the No. 1 Prospecting shaft on an underlay of 60o E to a depth of c.42’; ▪ driving of an ‘adit (& crosscut) from the bottom of this [Adit 2?]; ▪ driving of the eastern drive and associated adit drives; ▪ extension of Costean No.2; ▪ & cutting of all cuts on top of the hill (MRT UR 1951/113-161).
1936 (Jun)	<p>In 1936 the “Clarke lode is the only one of the series which has been opened underground and proved to contain a silver-lead ore shoot” (MRT UR 1936/24-26, 25);</p> <p>In 1936 the following workings are in place –</p> <ul style="list-style-type: none"> ▪ an underlay shaft sunk to 40’ with a NNW drive and an ESE crosscut (in operation in 1936) ▪ a prospecting adit 179’ SSW of the underlay shaft, and ▪ a prospecting adit 363’ NNE of the underlay shaft (in operation in 1936) ▪ trenches and an open cut to the NE [possibly trenches in main shaft area or Jones Prospect?] (MRT UR 1936/24-26)
1936 (Nov)	<p>By 1936 (Nov) –</p> <ul style="list-style-type: none"> ▪ the underlay shaft is at 40’, at the time the water level; ▪ recommends following development of the mine (& provides considerable advice on working and equipment specifications and options) – <ul style="list-style-type: none"> . an adit from the W side of the hill (not yet commenced) . a main shaft to cut the main lode at 200’ (recommended to be 9’ x 4’, timbered with frame sets) . continuing the underlay shaft to 110’ (MRT UR 1891-1969/83-84).
1936 (Dec)	<p>Jun – Dec 1936 – prospecting operation have been confined to the Jones Prospect area (ie, far northern workings) –</p> <ul style="list-style-type: none"> ▪ an adit driven from ‘Syd’s Cut; ¾ chn N of the 20’ shaft; still being worked in Dec 1936 as ore had not been found; ▪ No.1 Edwards Adit, located c.3 chains NNW from Syd’s Cut; ▪ No 2 Edwards Adit, located 2 chains+ SSW of No.1 Edwards Adit, still being worked; ▪ Dec 1936 - at the main Montana workings – <ul style="list-style-type: none"> ▪ 3 trenches cut in the vicinity of the underlay shaft on a formation c.70’ W of the shaft; <p>Concludes that “too much time has been wasted in attempting to prove the lines of lode over great lengths and that in future attention should be confined to developing the lode exposed in the immediate vicinity of the shaft [ie, underlay shaft]” (MRT 1936 (Dec) report, 58)</p>
1937-1939	<p>In Feb 1937 A.A. Summerhayes takes out four 40ac leases covering the full Montana Mine area (running N to S these leases are 11791M & 11790M (two northern blocks of which only 11790M is known to have workings), 11789M (main workings area & much of the original May Queen workings area), & 11917M) (G. Dickens research); the survey plan for the leases (Montana 113/6, 1937) shows a wire fence on 11791 in the NE corner, and an old bush track running from the N end of 11790 through the extreme SW corner of 11791 [(Stanley River Tk)];:</p> <p>Lease 11789M – 11791M leases are then transferred to the Montana Western Extended Silver Lead Co. NL in April 1937, then to the Montana SL Co. NL in Aug/Sept 1939 (G. Dickens research).</p> <p>Lease 11789 falls void in Aug 1939 (but is renewed from May 1958 to Jan 1961 (G. Dickens research).</p> <p>Lease 11917M is transferred to J.H.C. Reid in Nov 1937; then the R. Clarke in Oct 1939, then in the same month to R. Clarke, J. Howard & F. Reynolds who hold the lease until it falls void in June 1941(G. Dickens research)</p>
1938	<p>By Nov 1938 –</p> <ul style="list-style-type: none"> . a ‘Main Shaft’ (the enlarged former May Queen Shaft) is sunk to a depth of 110’ and has 3 drives, 3 cross cuts and 1 rise, with at least 1 cross cut at the 100’ level; a ‘No.2 Prospecting Shaft’ [probably hole at N end of CSA 3] has been sunk vertically to 42’ and has a 42’ long SW drive; and a ‘Main

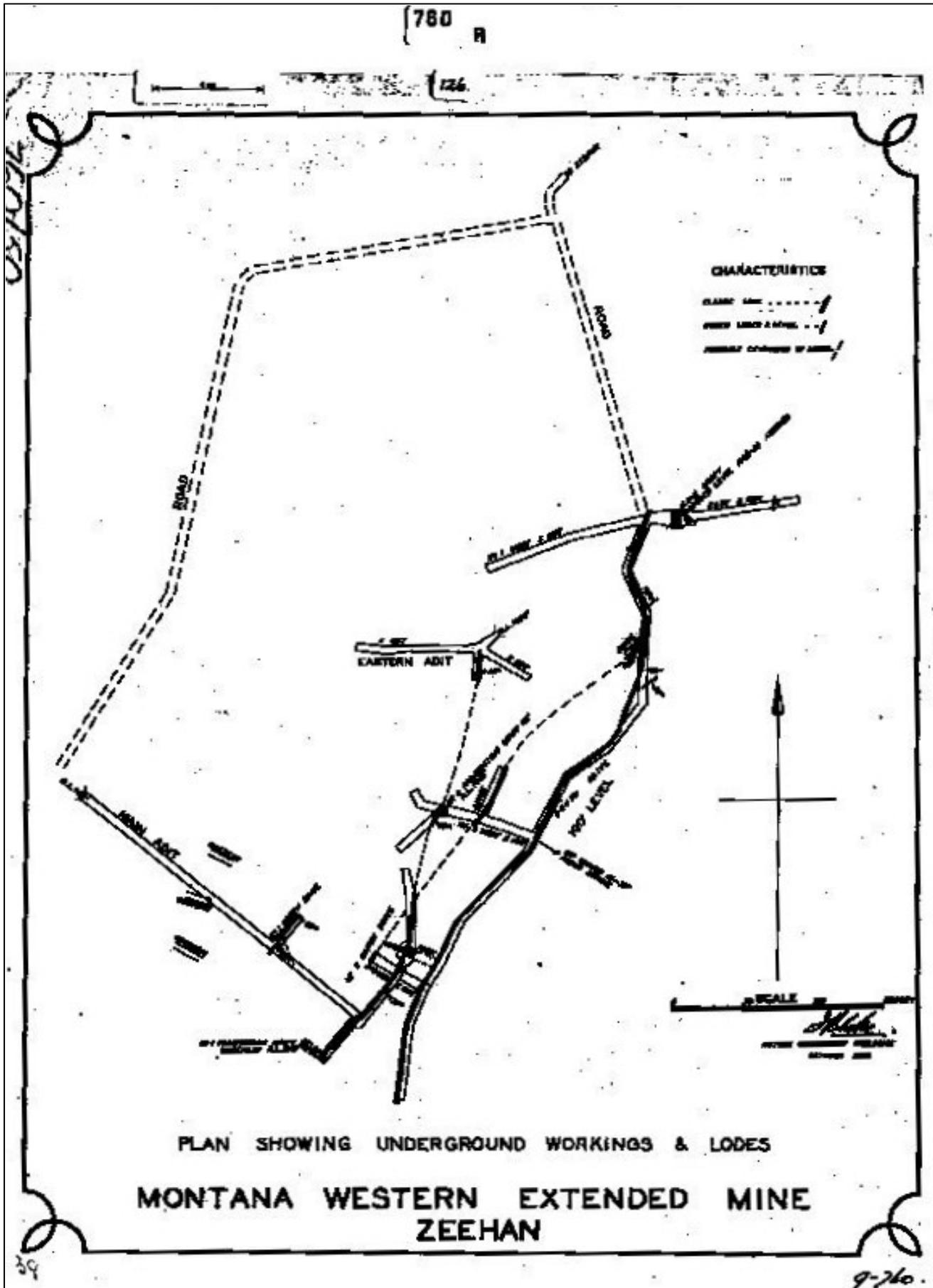
	<p>Adit [Adit] has been opened and has a 117' long (North Drive) & a 42' long south drive (connecting to the underlay shaft);</p> <p>. by Nov 1938 (ie from early 1937 to late 1938) the north drive alone (plus stoping) of the Main Shaft has produced 138 tons of first class ore, of which 80 tons of the millable ore has been taken to Mt Farrell for concentrating and the rest 'stacked at the surface'; and</p> <p>The recommendations for further work include – the deepening of the main shaft to 200', further excavation at the lower levels, and further work on the Main Adit south drive (MRT UR 1938/42-46).</p>
1939	<p>By May 1939 – several bore holes, including horizontal boring, have been drilled in the mine to further test the lode and further tunnelling in the mine has occurred, including (or only) at the 41' and 100' levels (MRT UR 139/18-20).</p>
1939-1941	<p>Leases 11790M & 11791M are transferred to the Montana SL Co. NL in Aug/Sept 1939 and are held until they both fall void in Feb 1960 (G. Dickens research)</p> <p>Mining proceeds continuously from April 1939 to early 1941 (under the Montana Western Extended SL Co. and Montana SL Co.) when operations suspended due to the low price of lead (MRT UR 1951/113-161).</p> <p>Operations in the period Aug/Sept 1939 – early 1941 include –</p> <ul style="list-style-type: none"> ▪ enlargement of the old May Queen shaft (incl deepening to 297), although work stopped at the end of 1939 due to water inflow; ▪ sinking of the No. 2 Prospecting Shaft and associated drive & stoping; ▪ additional rises, drives and crosscuts, including a rise to connect to the No. Prospecting Shaft and Main Adit, and the partial cutting of a plat at the 200' level (MRT UR 1951/113-161)
1947-1950	<p>In 1947 part of the mine was leased on tribute to R.E. Clarke and T. Brampton; this tribute was worked continuously by the until Aug 1950; work included connecting the Main Adit [Adit 2] with the No.2 Prospecting Shaft; no work was done at the 100' & 150' levels'; all access was by the Main Adit [Adit 2] as the Main shaft was not used (MRT UR 1951/113-161).</p>
1947-1952	<p>A new southern lease (101M/47) is taken out by C.R. Richardson until 1952 (this overlaps the southern c.1/5 of the original May Queen lease (area of Adit 4) and extends further south covering much of the area of Lease 11917M taken out by Summerhayes in 1937); lease plan (Montagu 116/20) shows a foot track along the south side of the creek and running SE-NW through the middle of the lease and a shed on the S side of the track on the W edge of the lease; and the Corinna Road and a parallel tramway to the S leading from the SE into lease 11789M (G. Dickens research).</p>
1950-1951	<p>From Sept 1950 operations were resumed by the Montana SL Co., then under the managership of R.E. Clarke (MRT UR 1951/113-161).</p> <p>Operations included de-watering the lower levels and putting the main shaft back in operation with work at the adit, 100' & 150' levels; the Main Adit [Adit 2] also in operation with ore from the adit being jigged and representing "the sole saleable product of the mine at present"; and a milling plant being installed in late 1951, in Nov 1951) expected to be in operation shortly', with ore from the shaft being stacked until the mill is ready (MRT UR 1951/113-161, 121).</p>
1951	<p>1951 (Nov) – a major, detailed report (including detailed mapping) on the Montana SL Mine (regarded as encompassing leases 11789, 90 & 91M) produced;</p>
1952	<p>In 1952 (Jan) – mine development and ore extraction is still occurring; are larger engine has been ordered to drive the Pomona Pump (designed to hold the water below 300' thereby allowing the main shaft to be sunk to 300' where a cross cut is intended);</p> <p>Between Nov 1951 and Jan 1952 – 'ore extraction and mine development work at the mine have proceeded', and mainly includes work in the main shaft and possibly Adit 2 in the areas of the Adit 2 drives and the No. 2 Prospecting Shaft (includes underhand and standard stoping at the adit level and considerable stoping at the 100' and 150' levels); the main shaft (or associated workings) also appears to have been sunk to at least 150'; the Eastern Adit (Adit 1) is also 'being cleaned out and rails laid into the drive onto the lode' with the intention being to 'make a connection with the adit [Adit 2?] level drive and bring out all ore above adit level via the Eastern Adit'; changes have been made to the rise connection from the 100' level to the adit level to create an 'ore pass' – with first class ore being trucked through the adit to the 'old jig', and with the milling ore going down the ore pass to the mill' (MRT UR 1952/3-7).</p>
1952	<p>Lease 101M/47 is transferred to S.A. Clarke, who holds it until it falls void in Nov 1958 (G. Dickens research).</p> <p>By 1952 (Aug) – S. A. Clarke (of Zeehan) has applied for financial assistance to carry out prospecting work on his lease with the aim of finding the southern extension of the Montana Main Lode (Clarke's lode), to which end he has started an adit ('Adit No. 1') (MRT UR 1952/62-64).</p> <p>In Aug 1952 – 'older and more recent prospecting work' include. 3 adits (No. 1, 2 & 3) with a total</p>

	<p>length of 413' two shallow shafts and 12 costeans; No.1 & 2 Adits and most of the costean have been developed by S.A. Clarke, but the other workings are older and the No. 3 Adit 'was driven many years ago';</p> <p>It is recommended that a trench c.90' long be dug between the No.1 & 2 shafts to the ESE; and Adit No.1 be excavated an additional 80'; and if no ore is found that the prospect be abandoned (MRT UR 1952/62-64).</p>
1954	BMR conducted geophysical surveys (SP, EM, ground magnetics and limited Pb geochemistry) for the Montana SL Mine around the mine site (MRT 89-3014, 593012).
1958-1961	Lease 11789 (40ac) (main workings area) is renewed from May 1958 to Jan 1961 by the Montana SL Co. NL (G. Dickens research)
1960	Leases 11790M & 11791M , held by the Montana SL Co. NL from Aug/Sept 1939, fall void in Feb 1960 (G. Dickens research)
1989	RGC Exploration P/L report map shows in the main workings area three collapse areas (SCA 1, 3 & 5) on the line of 'main lode, with SCA 1 described as a 'large pit' (MRT 89-3014, 593033).

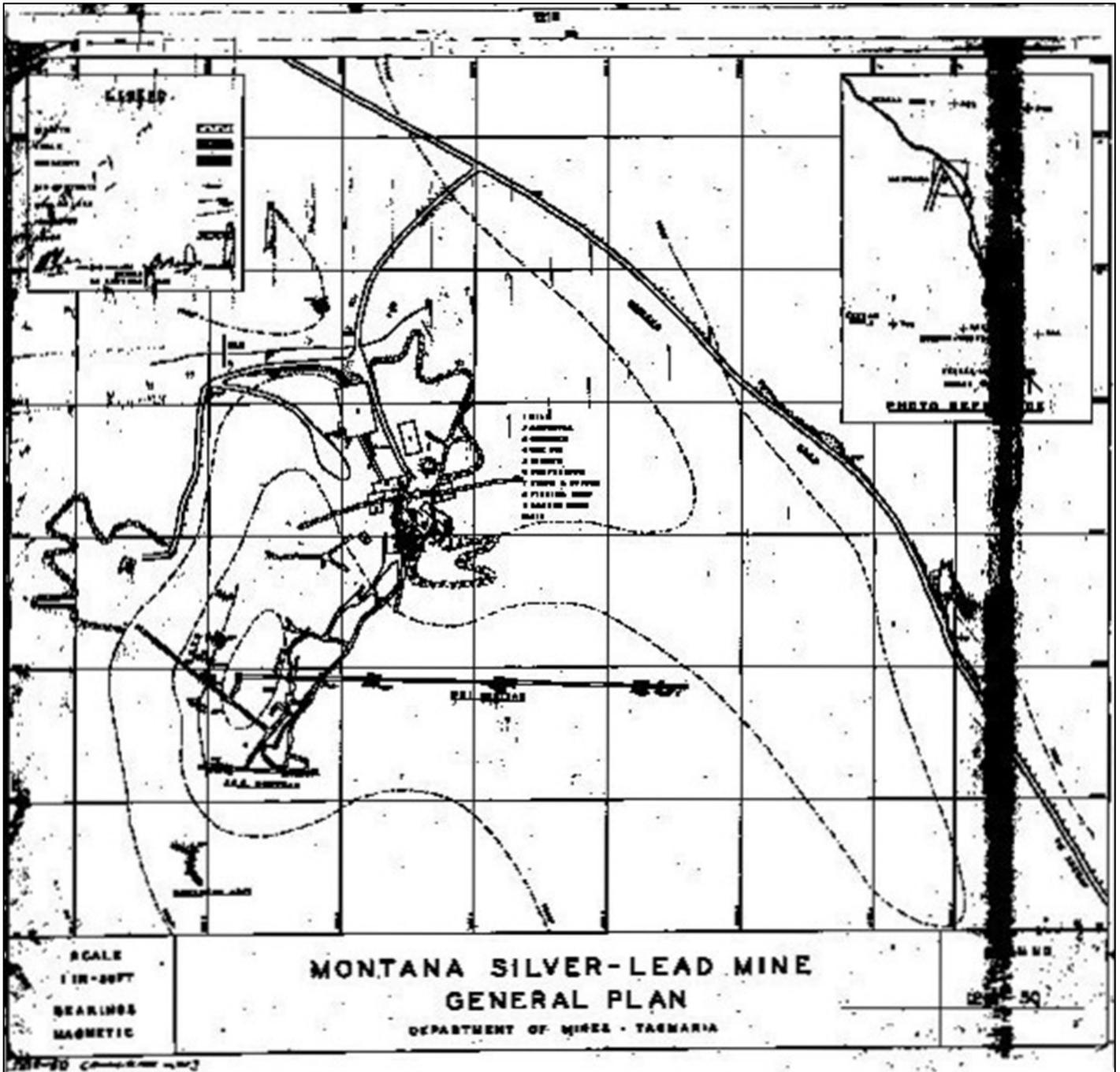
Appendix 2

HISTORICAL MAPS & PLANS

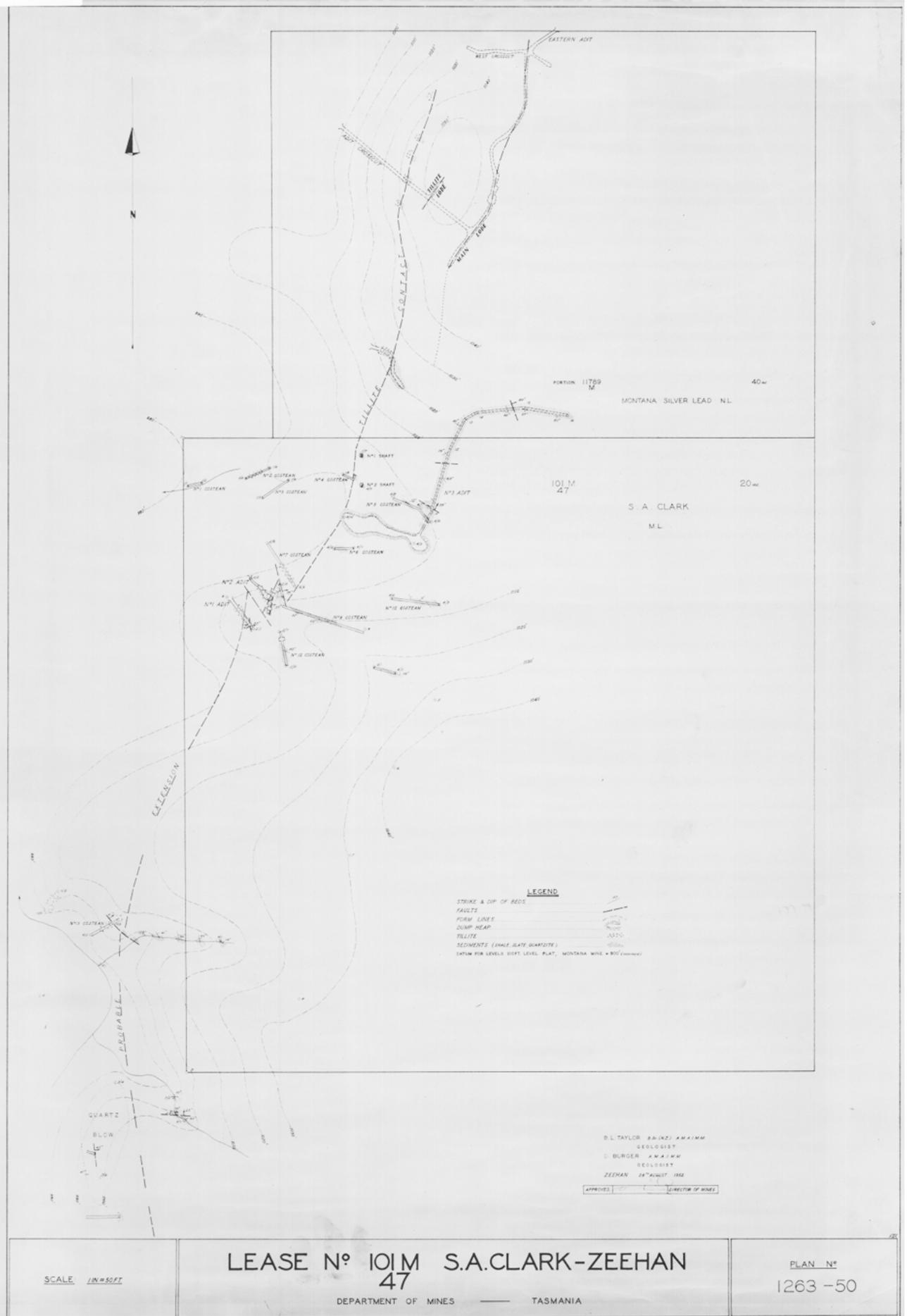
Montana SL Mine 1938 (MRT 760-126).



Montana SL Mine 1951 (MRT 1218-50).



Montana Silver Lead Mine 1952 (MRT Plan No. 1263-50 (Burger & Taylor)).



Appendix 3

PHOTOGRAPHIC RECORD (JAN 2013)

This record is divided into the following sections

1. General Views & Setting
2. Northern Workings
3. Central (Main) Workings
4. Southern Workings
5. Modern Disturbance

Except where otherwise indicated, all photographs were taken in Jan 2013.

A sketch plan of the Montana SL Site, showing the locations of the various parts of the mine and the various features is provided in Figure 6 (A&B) of the main report.

1. General Views & Setting



1.01 View W to main Montana SL Mine workings



1.02 View NE from Big Ben Mine to the main workings of the Montana SL Mine (& Adit 2 mullock and Tailings Area 1).



1.03 View NW from main workings (crest of hill) towards the northern workings (in trees in far distance).



1.04 View W from main workings (crest of hill) towards the Heemskirk Range in far distance.



1.05 View SW from main workings (crest of hill) up drainage of Barnetts Creek.



1.06 View S towards Zeehan from main workings (crest of hill).

2. Northern Workings



2.01 View NW from main workings (crest of hill) towards the northern workings (in trees in far distance).



2.02. View SW to vegetated valley in which the northern workings occur from the northern ridge.



2.03 Syd's Cut Adit portal (view c.NW).



2.04 Syd's Cut Adit portal, view inside the portal (view c.NW).



2.05 View NW across the dam wall; note section near SE bank breached by creek.



2.06 View NW along benched Stanley River Track towards the valley containing the northern workings.



2.07 View N to cuts on the spur south of the northern workings from the Stanley River Track.



2.08. View NE to the lower cut on the spur south of the northern workings.



2.09 View E to the upper cut on the spur south of the northern workings

3. Central (Main) Workings



3.01 View NW from southern mullock across main shaft area (small cleared space on RHS just beyond track) to mill.



3.02. View SE from car park across main shaft to southern mullock.



3.03 Capped main shaft (view NW)



3.04 View NW along northern edge (original) of the northern mullock in the main shaft area; note dumped 44 gal drums.



3.05 View NE across the northeastern area of main shaft mullock; note recent drain (red) through mullock.



3.06 Detail of concrete building foundation remnants by the edge of modern drain on E edge of mullock.



3.07. Northern part of southern (southeastern) mullock on edge of swamp (view E).



3.08. Central area (benched) of southern main shaft mullock (view W).



3.09. View SE to southern edge of benched southern main shaft mullock.



3.10. Adit 1 – remains of entrance (view SW).



3.11. Adit 1 – detail of blocked entrance (view SW).



3.12 Partially excavated finger dump between main tracks and main shaft southern mullock – probably early mullock from Adit 1 (view E)..



3.13. Collapsed stope area on hill crest – general view N across the collapse area.



3.14. Collapsed stope area on hill crest – CSA 1 (view S)



3.15. Collapsed stope area on hill crest – CSA2 (view S)



3.16. Collapsed stope area on hill crest – CSA 3 N end with hole that is probably the No.2 Prospecting Shaft (view N).



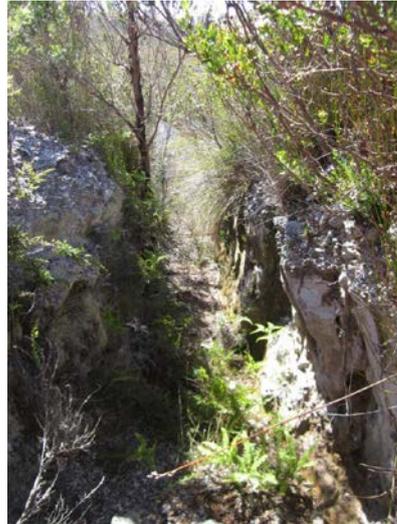
3.17. Collapsed stope area on hill crest – CSA 3 & 5; view S from S end of CSA 3 and across CSA 5.



3.18. Collapsed stope area on hill crest – CSA 4 (view N).



3.19. Area of rehabilitation or mineral exploration on hill crest on SW edge of the collapsed stope area – probable location of the No.1 Prospecting Shaft (view W).



3.20. Western edge of hill crest – one of the 'cuts' (view W)



3.21. Western edge of hill crest –the 'cut' in 3.20 (view NE)



3.22. Western edge of hill crest – another of the 'cuts' (view W).



3.23 Western edge of hill crest – southernmost of the 'cuts'; possibly 'costean 2' (continues to figure) (view W)



3.24 Adit 2 – mullock and tailings associated with Adit 4. (view W from hill crest).



3.25. Adit 2 – View SE across the mullock to the adit at base of hill.



3.26. Adit 2 – entrance. (view E).



3.27. Adit 2 – portal; note remains of timbering (view E)



3.28. Adit 2 – inside portal; note probable adit blockage, water (seepage), and remains of timbering (view E)



3.29. Adit 2 – view E along finger dump to adit entrance at base of hill.



3.30. Adit 2 – view W from adit entrance across the three finger dumps.



3.31. Adit 2 – view NW to northern finger dump and to Tailings Area 2.



3.32. Adit 2 – view N across eastern half of Tailings Area 2; note platform for jig on RHS.



3.33. Adit 2 – view NE across northern end of jig platform to related remains (unrelated? Car body in far distance).



3.34. Adit 2 – view N across jig platform to related remains; jig foundation flat area in far centre.



3.35. Adit 2 – detailed view of jig location – timbers in foreground are on the platform, and the timbers below are on the lower (tailings) level (view W).



3.36. Tailings Area 2 – fan of finger dumps in central N edge (view NW).



3.37 Tailings Area 1 – view N from the crest of the hill.



3.38 Tailings Area 1 – view W across the tailings area from the E edge.



3.39 Tailings Area 1 – view NW across the southern half of the tailings which is dumped material.



3.40 Tailings Area 1 – view NW across the central and western part of the tailings showing coarser dumped material, and finer washed material.



3.41 Tailings Area 1 – view SE across the central part of the tailings.



3.42 Tailings Area 1 – view S across the e tailings showing the scatter of broken glass, metal and timber.



3.43. Tailings Area 1 – view of a concentration of broken glass, metal and timber.



3.44. Buildings Area – view S from carp park to levelled area that housed the ore bin, ore crusher & winder (note conveyor remains on RHS).



3.45. Buildings Area – water tank 2 and scattered cgi sheet in area of ore crusher and winder house.



3.46. Buildings Area – brick chimney cut into recess at the base of hill in area of winder house.



3.47. Buildings Area – brick rubble mound (former flue?) in front (E) of brick chimney in area of winder house.



3.48. Buildings Area – detail of bricks in brick mound (photo 3.47); one brick has imprint “BD&C...”.



3.49. Buildings Area – concrete edged foundation (equipment foundation or water tank?) in area of ore crusher (view W).



3.50. Buildings Area –foundation (conveyor, ore bin ?) on W edge of car park at the E end of the northern conveyor line (view W).



3.51. Buildings Area – foundation with metal spikes and scattered metal and water pipe in area of winder house (winder foundations?) (view SW).



3.52. Buildings Area – earth mound and cgi sheet to S of foundation shown in 3.51 (view S).



3.53. Buildings Area –ore bucket located on track edge E of winder (view W).



3.54 Buildings Area – track leading W uphill from behind (W) of winder house.



3.55. Hill behind buildings area and mill – track leading W uphill from behind (W) of winder house; bedlog with iron spikes located where figure is standing (view E)



3.56. Hill behind buildings area and mill – concrete engine bed (double concrete foundation) (view SE).



3.57. Hill behind buildings area and mill – detail of concrete engine bed (double concrete foundation) shown in 3.56 (view E).



3.58. Hill behind buildings area and mill – view N down hill crest to power line and water tank 1.



3.59. Hill behind buildings area and mill – detail of water tank 1 (view E).



3.60 Conveyors – view SW from car park to area of the 2 conveyor lines (note watertank 2 on LHS and mill building is to RHS of image).



3.61 Conveyors – view W to area of the 2 conveyor lines (note mill building on RHS of image).



3.62. Conveyors – view E from mill building down both conveyor lines.



3.63. Conveyors – view SE down the lower part of conveyor line 1.



3.64. Conveyors – view W to lower end of conveyor line 1.



3.65 Conveyors – view W to edge of upper part of conveyor line 1, and mill building behind.



3.66 Mill (1951) – general view SW to mill (note water tank 1 behind).



3.67. Mill –view S to mill from the entrance track to the Montana SL Mine (note water tank 1 behind).



3.68. Mill – general view NW to mill across the main shaft from the southern mullock.



3.69. Mill –view NW from car park to E wall.



3.70. Mill –view SE from intersection of main track and track to Adit 4 to N wall.



3.71 Mill –view SE to NW corner of building.



3.72. Mill –view SW to entrant on E wall of building.



3.73. Mill –view E along central part and W wall of building.



3.74. Mill –view SE across main floor building.



3.75. Mill –view E across main floor building; note metal ore crushing bin.



3.76. Mill –view N(NW) from upper floor level, includes main floor level features on the RHS.



3.77. Mill –view W across upper floor level.



3.78. Mill –view NW across upper floor level showing rail for ore dumping and main floor rails below.



3.79. Mill –view SW across small room off W wall and the scattered asbestos wall cladding remains.



3.80 Tracks – view SE to the SE corner of Tailings Area 1 with the track to the main shaft area running L and the track to Adit 2 running R.



3.81. Tracks – view NE across disturbed area of the track from the main shaft area to Adit 2 at the SE corner of Tailings Area 1.



3.82. Tracks – view NE along the E-W section of the track from the main shaft to Adit 2.



3.83 Tracks – view SE up the track up to water tank 1 from the W end of the E-W section of the track from the main shaft to Adit 2.

4. Southern Workings



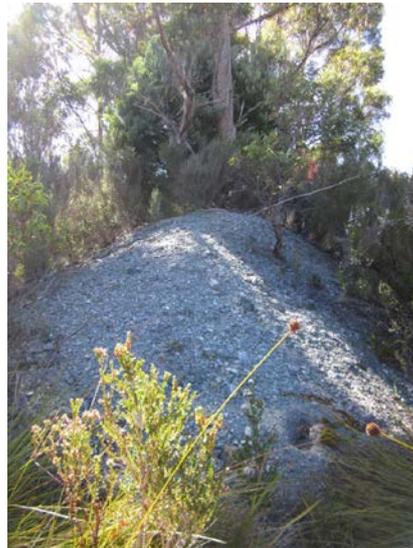
4.01 Adit 3 – entrance (G. Dickens at portal) (view c.E).



4.02. Adit 3 – portal, detail (view c.E).



4.03 Adit 3 – inside the portal (adit appears to bend to the right) (view c.E).



4.04 Adit 3 – mullock (finger dump) outside entrance (view c.E).



4.05 View c.NE from the flats to the finger dump outside Adit 3.



4.06 Trench 8 - view c.E along the trench and lower built-up spoil; W of Adit 4).



4.07 Adit 4 – view c.NE to entrance and portal (entrance appears to partly filled in with sediment).



4.08. Adit 4 – view c.NE inside portal.



4.09 Adit 4 – finger dump to south; note large eucalypts (view c.W).



4.10 Adit 4 – finger dump to south (view c.E from nose of dump).

5. Modern Disturbance



5.01. Rehabilitated area of c. 2008 mineral exploration works on crest of hill (roading from mineral exploration on distant hill indicates extent of exploration to E) (view E).



5.02. Rehabilitated area of c. 2008 mineral exploration works on crest of hill (view SE down hill crest).



5.03 Rehabilitated area of c. 2008 mineral exploration works on crest of hill – view E across collapsed stope area to rehabilitated benched area (originally collapsed stoping?).



5.04. Drain cut through the northeastern main shaft mullock area to drain main shaft seepage in c.2004-06 (view NE).



5.05. Drain cut through the track from main shaft to Adit 2 at the intersection with Tailings Area 2; cut to divert water away from tailings in c.2004-06 (view SW).



5.06 Southern diversion channel cut around Tailings Area 2; cut to divert water away from the tailings in c.2004-06 (view E from S of the tailings area).



5.07. View NE across Tailings Area 1 – low linear mound in distance is spoil from a diversion channel cut to divert water away from the tailings in c.2004-06.



5.08. View the diversion channel cut around the NE edge of Tailings Area 1 to divert water away from the tailings in c.2004-06.