APPENDIX 1

SITE GAZETTEERS
APPENDIX 1: SITE GAZETTEERS

A selection of Site Gazetteers for some important Alps National Parks mining sites (not included in the sample Heritage Action Plans) is presented here. These Gazetteers can be used as templates for further recording of important mining sites/landscapes that may be undertaken by or on behalf of Parks Victoria and the National Parks & Wildlife Service of NSW.

Summary information only is included. Acknowledgement is given to the North East Victoria and Gippsland reports produced by the Historic Gold Mining Sites Assessment Project (Victorian Goldfields Project), for some information on Victorian sites, and Mike Pearson’s Kosciusko report (1979) for some information on NSW sites.

Sites included are:

- **Brandy Creek Mine**, Bogong Unit, Alpine National Park p 70
- **Accommodation Creek Copper Mine**, Snowy River National Park 71
- **Lobbs Hole Copper Mine**, Kosciusko National Park 72
- **Mt Murphy Wolfram Mine**, Mt Murphy Historic Area 73
- **The Tin Mine**, Kosciusko National Park 74
- **Good Hope Mine**, Grant Historic Area 75
- **Grey Mare Mine**, Kosciusko National Park 76
- **Maude & Yellow Girl Mine**, Mt Wills Historic Area 77
- **Mt Moran Mine**, Mt Wills Historic Area 78
- **Red Robin Mine**, Bogong Unit, Alpine National Park 79
- **Champion Mine Battery Site**, Bogong Unit, Alpine National Park 80
- **Razorback Mine**, Bogong Unit, Alpine National Park 81
  
  *(Template for Site Gazetteers)* 82

Map references are AGD 1966 grid references.
<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>BRANDY CREEK MINE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other Names</strong></td>
<td>White’s workings, Cobungra sluicing works, Umaeri GMC’s workings; includes Cobungra township.</td>
<td></td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>Beside Brandy Creek Fire Trail, on a spur between Murphy’s &amp; Brandy creeks, approximately one kilometre from the Great Alpine Road.</td>
<td></td>
</tr>
<tr>
<td><strong>Map Ref</strong></td>
<td>AMG 517480E, 5904170N (pit)</td>
<td><strong>M’ment Status</strong></td>
</tr>
<tr>
<td><strong>Site History</strong></td>
<td>The Cobungra River was worked for gold in the 1850’s, and Brandy Creek from the mid-1860’s. White worked the deep lead in the 1870’s, but the peak years were the 1880’s, when the Cobungra GMC hydraulic-sluiced over a million cubic yards of material, working a face up to 100’ high. A small township existed at this time, with stores &amp; hotels. The Umaeri GMC worked the claim into the 1920’s, sluicing &amp; tunnelling.</td>
<td></td>
</tr>
<tr>
<td><strong>Site Description</strong></td>
<td>The site consists of a large area of hydraulic sluicing, bounded by high remnant faces on the south and west sides. On the spur below the workings, and extending into &amp; down Murphy’s Creek, are extensive ground sluicing works, with low wind-rowed shingle heaps. Some archaeological evidence of occupation sites shows in the main sluicing pit, but the old Brandy Creek (Cobungra) township site has not been located, nor has the machinery site where a battery was installed to crush cement. A large water race crosses the access track to the mine.</td>
<td></td>
</tr>
<tr>
<td><strong>Interpretation Of Features</strong></td>
<td>The main pit is excavated on the exposure of a basalt covered, gold-bearing deep lead (palaeo-river), and the associated ground sluicing is on thin hill soils derived from erosion of the lead. Water for hydraulic sluicing was brought by water races, the largest of which is on the hillside above the main pit. The gold deposits were extensive &amp; rich enough to support a small settlement.</td>
<td></td>
</tr>
<tr>
<td><strong>Condition</strong></td>
<td>The features are generally in good condition, but there is evidence of some post-mining gravel removal. The high sluicing faces have slumped into the pit.</td>
<td></td>
</tr>
<tr>
<td><strong>Threats</strong></td>
<td>The only threats to the site are from further gravel removal.</td>
<td></td>
</tr>
<tr>
<td><strong>Identified Public Risk</strong></td>
<td>It is assumed that risk assessments &amp; action have already been undertaken, as an open shaft beside the track has been mesh-capped.</td>
<td></td>
</tr>
<tr>
<td><strong>Networks</strong></td>
<td>Brandy Creek – Boiler Plain – Tabletop – Dargo High Plains (related deep lead workings)</td>
<td></td>
</tr>
<tr>
<td><strong>Historic Themes</strong></td>
<td>3.4.1 Mining (Utilising natural resources); 5.1 Working in harsh conditions.</td>
<td></td>
</tr>
<tr>
<td><strong>Significance</strong></td>
<td>State. Best example of high altitude sluicing in State; shows rare, extensive hillside ground-sluicing; has archaeological potential to reveal information about living conditions at an early period of mining in the Australian Alps</td>
<td></td>
</tr>
<tr>
<td><strong>Existing Use</strong></td>
<td>None</td>
<td><strong>Access</strong></td>
</tr>
<tr>
<td><strong>Tourism Potential</strong></td>
<td>High. Has potential for development as an interpretive site, because of its location, significance, visual qualities, and ease of access.</td>
<td></td>
</tr>
<tr>
<td><strong>Assessed by</strong></td>
<td>Rob Kaufman</td>
<td><strong>Date</strong></td>
</tr>
<tr>
<td>ID</td>
<td>Name</td>
<td>ACCOMMODATION CREEK COPPER MINE</td>
</tr>
<tr>
<td>----</td>
<td>-----------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Other Names</td>
<td>Black Snake Copper Mine, Mt Bowen Copper Mine</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Situated on the Park boundary, approx 2.5km south of Deddick.</td>
<td></td>
</tr>
<tr>
<td>Map Ref</td>
<td>AMG 632900E, 5892500N</td>
<td></td>
</tr>
<tr>
<td>M’ment Status</td>
<td>Snowy River National Park</td>
<td></td>
</tr>
<tr>
<td>Site History</td>
<td>The lode was probably discovered in 1899, although in 1929 it was said to have been known for over 60 years. Little work was done before 1907. Two adits had been dug and minor production recorded by 1929. Regular mining began in 1959, by the Victorian Refining &amp; Smelting Co. Gippsland Minerals NL operated the mine on a larger scale in 1969-70. The mine, referred to as relatively low-grade, closed in 1971.</td>
<td></td>
</tr>
<tr>
<td>Site Description</td>
<td>Workings consist of shafts, trenches &amp; adits, and associated mullock dumps. The main adit is at creek level, and connects to an internal shaft. There are the remains of a battery shed, with an upper &amp; lower concrete floor. The battery standards (oregon), camshaft &amp; flywheel remain standing on the upper floor, but the stems &amp; box lie scattered around the site. Scattered machinery fragments lie around the lower floor. Below the battery shed is a small, full slum dam.</td>
<td></td>
</tr>
<tr>
<td>Interpretation Of Features</td>
<td>The features left at the site show the relatively-recent remnants of small copper mining and concentrating operation. The ore, mined from the main adit &amp; internal shaft, was crushed in the battery, and presumably passed over concentrating tables (eg Wilfley tables). The copper concentrates must have been trucked away for further processing, as no smelter site is in evidence at the site.</td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>Battery Site: Fair. The battery shed is a ruin, and the battery box has been blown up. However, the surviving inventory of relic machinery &amp; parts is still relatively good, compared to other, similar mining sites. Workings &amp; dam: Good.</td>
<td></td>
</tr>
<tr>
<td>Threats</td>
<td>Major threats are wildfire (wooden standards etc); pilfering of relic machinery &amp; scrap.</td>
<td></td>
</tr>
<tr>
<td>Identified Public Risk</td>
<td>Not assessed.</td>
<td></td>
</tr>
<tr>
<td>Networks</td>
<td>Accommodation Creek Copper Mine – Deddick – Bonang-Gelantipy Road – other base metal mines in Snowy River NP.</td>
<td></td>
</tr>
<tr>
<td>Historic Themes</td>
<td>3.4.1 Mining (Utilising natural resources).</td>
<td></td>
</tr>
<tr>
<td>Significance</td>
<td>Regional. Has historical significance, because copper mining was a minor industry in the State, and few sites survive; Has scientific significance for the range of surviving features associated with copper mining.</td>
<td></td>
</tr>
<tr>
<td>Existing Use</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>Via track from Bonang-Gelantipy Road</td>
<td></td>
</tr>
<tr>
<td>Tourism Potential</td>
<td>Low. Situated in remote area, and presents management &amp; maintenance constraints.</td>
<td></td>
</tr>
<tr>
<td>Assessed by</td>
<td>Rob Kaufman</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>December 2001</td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>Name</td>
<td>LOBBS HOLE COPPER MINE</td>
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<tr>
<td>Other Names</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Situated on Yarrangobilly River, upstream of its intersection with the Tumut River.</td>
<td></td>
</tr>
<tr>
<td>Map Ref</td>
<td>AMG 626700E, 6037950N</td>
<td></td>
</tr>
<tr>
<td>M’ment Status</td>
<td>Kosciusko National Park</td>
<td></td>
</tr>
<tr>
<td>Site History</td>
<td>Lobbs Hole was an old stopping place on the road to the Kiandra diggings, and copper ore may have been discovered as early as 1866. Mining began in 1874, and continued through the 1890’s. Peak years were the first decade of 1900’s. In 1907 the Lobs Hole Copper Mining Co was formed, and they built a smelter, poppetheads &amp; 38HP turbine fed by pipes from a water race. Mining ceased in 1916, and the syndicate was folded up in 1919.</td>
<td></td>
</tr>
<tr>
<td>Site Description</td>
<td>The site is quite open, and consists of mine workings (4 visible shafts: two with mullock dumps and two mesh-capped &amp; with mullock removed), a small open cut, and a smelter site. Beside the river, there are concrete footings with iron bolts, and some scrap parts of earlier pieces of machinery. A small cutting is visible to the north of No 1 shaft. The smelter site is principally heaped brick-rubble and twisted ironwork. There is a partly-excavated pile of slag from the furnace. More features may be hidden under blackberry &amp; scrub growth.</td>
<td></td>
</tr>
<tr>
<td>Interpretation Of Features</td>
<td>The concrete footings beside the river are associated with a Pelton wheel power plant. The small cutting formerly contained a tramway that connected No 1 Shaft to the smelter. The workings are distributed within a narrow line, approximating the line of the copper lode. This mine was large enough to support a sizeable township (Ravine) during its peak years.</td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>Condition is generally poor – fair. The smelter site is very degraded, and a few visible bricks laid on the ground may be all that remains of the former structure. The area around the two meshed shafts is disturbed, and all mullock has been removed. The open cut also appears disturbed. The concrete footings are in good condition.</td>
<td></td>
</tr>
<tr>
<td>Threats</td>
<td>The site is threatened by further mullock removal, and use of materials for camp-site fireplaces (bricks).</td>
<td></td>
</tr>
<tr>
<td>Identified Public Risk</td>
<td>No 1 Shaft shows signs of recent subsidence; more shafts may exist under the blackberry growth. Other copper mines in the vicinity were not inspected.</td>
<td></td>
</tr>
<tr>
<td>Networks</td>
<td>Lobbs Hole Copper Mine – water race (to provide water from turbine) – adjacent copper mines – Ravine township site &amp; Washington Hotel ruins – Kiandra road – Kiandra.</td>
<td></td>
</tr>
<tr>
<td>Historic Themes</td>
<td>3.4.1 Mining (Utilising natural resources).</td>
<td></td>
</tr>
<tr>
<td>Significance</td>
<td>Regional.</td>
<td></td>
</tr>
<tr>
<td>Existing Use</td>
<td>Camping area</td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>Via dirt track off Cabramurra – Kiandra road</td>
<td></td>
</tr>
<tr>
<td>Tourism Potential</td>
<td>Medium. The site is accessible by 2WD vehicle, and is a designated camping place. Lobbs Hole Copper Mine could be interpreted as part of wider interpretation of Lobbs Hole/Ravine, and the road to the Kiandra diggings.</td>
<td></td>
</tr>
<tr>
<td>Assessed by</td>
<td>Rob Kaufman &amp; Lorraine Thompson</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>October 2001</td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>Name</td>
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<tr>
<td></td>
<td>MT MURPHY WOLFRAM MINE</td>
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</tr>
</tbody>
</table>

**Other Names**

Brookfield’s Lease; Benambra Wolfram Syndicate mine

**Location**

Western slopes of Mt Murphy

**Map Ref**

AMG 592000E, 5935400N

**M’ment Status**

Mt Murphy Historic Area

**Site History**

The deposit was first discovered in about 1890, but by 1906 only a few shallow cuts had been made. The Benambra Wolfram Syndicate was formed in 1907, and erected plant. In 1913, the Mt Murphy Wolfram Mining Co was floated. Work continued until 1920, with £9601 of wolfram produced. The mine was briefly re-opened in 1942 by the Controller of Mineral Production, because of wartime tungsten demand. Last mined in 1943.

**Site Description**

Workings consist of two adits on the main reef, and two more on a smaller reef. An upper site adjacent to No 2 Adit contains a concrete floor, battery foundations, a Wilfley table, and a scatter of machinery parts. A tailings pond is part of this site. A lower site, approximately 220m to the NW and formerly connected to the upper site by an inclined tramway, contains a long benched platform, a loading ramp, and substantial concrete foundations. At the eastern end of this platform is a scatter of artefacts, including battery, pump, engine & boiler parts.

**Interpretation Of Features**

The upper site appears to be the remnants of the 1907 plant, while the lower site is the remnants of the 1913 plant, financed by the floating of the company. During WWII, plant had to be re-erected at the mine, because most of the original plant had been removed by 1922. It is presumed the new plant was installed at the lower site. Crushing & concentration only were carried out on site. Concentrates were trucked out for refining.

**Condition**

Poor – fair. The upper site has been heavily scavenged and integrity is low. Lower site is less disturbed.

**Threats**

Not assessed.

**Identified Public Risk**

Not assessed.

**Networks**

None.

**Historic Themes**

3.4.1 Mining (Utilising natural resources).

**Significance**

Regional.

Has scientific significance, for the large collection of mining relics associated with this form of mining;

Has archaeological potential to reveal information about the technological history of mining.

**Existing Use**

None

**Access**

Via Mt Hope Track, or Aust Alps Walking Track

**Tourism Potential**

Low. Limited by the remoteness of the site; accessible from the Australian Alps Walking Track.

**Ref**


**Assessed by**

Rob Kaufman

**Date**

October 2001
<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>THE TIN MINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Names</td>
<td>Includes Charlie Carter’s huts.</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>In remote country near Mt Pilot in southern NSW Alps, on the Australian Alps Walking Track (AAWT).</td>
<td></td>
</tr>
<tr>
<td>Map Ref</td>
<td>AMG 611000E, 5938000N</td>
<td>M’ment Status</td>
</tr>
<tr>
<td>Site History</td>
<td>First alluvial tin discovered 1875. By 1892, a good deal of alluvial tin had been won, and numerous shafts up to 40’ deep had been sunk on a tin-bearing quartz reef. James Pendergast was a claimholder. No further activity is recorded until 1936, when the Mt Pilot Tin Syndicate NL was formed. Road access from Benambra, Vic, was cut, buildings erected, water races cut, etc, but little tin was produced. Charlie Carter moved here in the late 1940’s (?).</td>
<td>Kosciusko NP, Southern Region</td>
</tr>
<tr>
<td>Site Description</td>
<td>The site has a collection of corrugated iron huts, including a one-room hut, SMA 2-roomed hut, a ruined workshop, and several workers huts. Workings consist of water races, shafts, sluicing works etc, but are yet to be surveyed. (Information from NPWS Historic Sites database).</td>
<td></td>
</tr>
<tr>
<td>Interpretation Of Features</td>
<td>As well as mine workings, the broader site contains evidence of Charlie Carter’s occupation, evidence of the Mt Pilot Tin Syndicate NL’s infrastructure, and evidence of the operations of the Snowy Mountains Authority hydrological station (set up in 1954).</td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>Not assessed.</td>
<td></td>
</tr>
<tr>
<td>Threats</td>
<td>Not assessed in field. Wildfire would be a major threat to buildings.</td>
<td></td>
</tr>
<tr>
<td>Identified Public Risk</td>
<td>Not assessed.</td>
<td></td>
</tr>
<tr>
<td>Networks</td>
<td>Charlie Carters/Tin Mine Huts – water race &amp; track networks – alluvial diggings on Tin Mine and other creeks in the vicinity – tin lode workings near Mt Pilot.</td>
<td></td>
</tr>
<tr>
<td>Historic Themes</td>
<td>3.4.1 Mining (Utilising natural resources); 3.1.6 Struggling with remoteness, hardship &amp; failure; 1.3 Assessing scientifically diverse environments; 8.11 Making Australian folklore.</td>
<td></td>
</tr>
<tr>
<td>Significance</td>
<td>State. Has historical significance for the wide variety of important historic themes represented. Has scientific significance for the range of extant huts &amp; the information they contain, and for the range of tin workings (primary &amp; alluvial).</td>
<td></td>
</tr>
<tr>
<td>Existing Use</td>
<td>Shelter, on Aust Alps Walking Track</td>
<td>Access</td>
</tr>
<tr>
<td>Tourism Potential</td>
<td>Medium. Limited by remoteness, but has interesting history and is a rare cultural site in a wilderness location.</td>
<td>MVO track (AAWT) from Alpine Way</td>
</tr>
<tr>
<td>Ref</td>
<td>“Mt Pilot Tin &amp; Gold Deposits”, 1860-1956, Report No MR02460, DIGS on-line database, DMR, NSW.</td>
<td></td>
</tr>
<tr>
<td>Assessed by</td>
<td>Rob Kaufman</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td>October 2001</td>
</tr>
<tr>
<td>ID</td>
<td>Name</td>
<td>GOOD HOPE MINE</td>
</tr>
<tr>
<td>----</td>
<td>--------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Other Names</td>
<td>Old Good Hope Mine; site includes New Good Hope Mine (Good Hope Consolidated)</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>OGH: At head of Good Hope Creek; NGH: On spur between McMillan’s Track &amp; Crooked River</td>
<td></td>
</tr>
<tr>
<td>Map Ref</td>
<td>AMG 509000E, 5867500N (Old)</td>
<td></td>
</tr>
<tr>
<td>M’ment Status</td>
<td>Grant Historic Area</td>
<td></td>
</tr>
<tr>
<td>Site History</td>
<td>The Good Hope reef was opened in 1864, and the first treatment plant installed in 1865. Four adit levels and an internal shaft were used, and the mine outlived and out-produced all others on the field. A 5th adit was commenced from the other side of the spur in 1906 (New Good Hope), but was unsuccessful. Total recorded production was over 23,000 ounces of gold, with £27,000 paid in dividends.</td>
<td></td>
</tr>
<tr>
<td>Site Description</td>
<td>The Old Good Hope site has 4 adit levels &amp; mullock heaps, with traces of tracks &amp; inclined tramways. Ore trucks, rail lines &amp; the remains of a winch are extant. At the treatment plant, there is a boiler, horizontal steam engine, 8-h battery, brick reverberatory furnace, concentrating pans, etc, as well as hot sites, water race, &amp; dam. At the New Good Hope (No 5 Adit) there is a standing, iron-framed 5-h battery and a portable steam engine. The adit has a large mullock dump, and 2 ore trucks are visible. Other features may exist at either site.</td>
<td></td>
</tr>
<tr>
<td>Interpretation Of Features</td>
<td>The site(s) show the progress of operations, from the early surface workings, to the various adit levels downhill. The location of the New Good Hope adit on the other side of the spur was dictated by the dip of the reef, and the prevailing topography. The machinery relics show the introduction of new technologies to the site.</td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>Not assessed.</td>
<td></td>
</tr>
<tr>
<td>Threats</td>
<td>Not assessed.</td>
<td></td>
</tr>
<tr>
<td>Identified Public Risk</td>
<td>Not assessed</td>
<td></td>
</tr>
<tr>
<td>Networks</td>
<td>Old Good Hope – New Good Hope – Grant township site – Grant Cemetery – Mc Millan’s Track (Talbotville road) – Crooked River diggings &amp; quartz mines.</td>
<td></td>
</tr>
<tr>
<td>Historic Themes</td>
<td>3.4.1 Mining (Utilising natural resources).</td>
<td></td>
</tr>
<tr>
<td>Significance</td>
<td>State. Outstanding range of extant relics that show the development of mining &amp; processing technologies. Excellent representative example of this type of mining, that predominated in the eastern ranges of Victoria.</td>
<td></td>
</tr>
<tr>
<td>Existing Use</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>Via foot track from Grant-Talbotville road</td>
<td></td>
</tr>
<tr>
<td>Tourism Potential</td>
<td>High. Limited by remoteness, but with improved access, potential would be enhanced. Site has a remarkable array of features relating to an early period of quartz mining in Victoria.</td>
<td></td>
</tr>
<tr>
<td>Assessed by</td>
<td>Rob Kaufman</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>November 2001</td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>Name</td>
<td>GREY MARE MINE</td>
</tr>
<tr>
<td>----</td>
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</tr>
<tr>
<td>Other Names</td>
<td>Bogong Reef; site includes Grey Mare Hut and Bogong (alluvial) gold diggings.</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Jagungal Wilderness, on Australian Alps Walking Track.</td>
<td></td>
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<tr>
<td>Map Ref</td>
<td>AMG 620100E, 5991600N</td>
<td></td>
</tr>
<tr>
<td>M’ment Status</td>
<td>Kosciusko NP, Southern Region</td>
<td></td>
</tr>
<tr>
<td>Site History</td>
<td>The Bogong Lead was discovered by Williams &amp; party in 1894, and the limited ground was worked by 30 men. The Bogong (Grey Mare) Reef was discovered in 1895, and several claims were taken up &amp; worked. Production in 1902 was over 1000oz. New machinery was erected in 1915. The mine was re-opened by a syndicate in the mid-1930’s, and in 1950 a company was installing a 10-h battery and continuing driving in a lower adit.</td>
<td></td>
</tr>
<tr>
<td>Site Description</td>
<td>The site has not been sufficiently recorded to provide a comprehensive description. The Grey Mare Hut and the relic machinery (including dismantled stamp battery) are well known, but the mine workings (of various ages) along the line of reef, and the Bogong alluvial diggings, have not been described.</td>
<td></td>
</tr>
<tr>
<td>Interpretation Of Features</td>
<td>The bogong (Grey Mare) Reef was the source of the gold worked in the Bogong Lead (product of the erosion of the outcrop of the quartz reef).</td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>The remnant machinery is in fair-good condition, and the Grey Mare Hut is maintained. Grey Mare diggings hut in ruins. Diggings and quartz reef workings have not been assessed.</td>
<td></td>
</tr>
<tr>
<td>Threats</td>
<td>Not assessed.</td>
<td></td>
</tr>
<tr>
<td>Identified Public Risk</td>
<td>Not assessed.</td>
<td></td>
</tr>
<tr>
<td>Networks</td>
<td>Grey Mare Mine – other reef workings on line – huts – Bogong diggings.</td>
<td></td>
</tr>
<tr>
<td>Historic Themes</td>
<td>3.4.1 Mining (Utilising natural resources); 5.1 Working in harsh conditions.</td>
<td></td>
</tr>
<tr>
<td>Significance</td>
<td>State. Has scientific significance, for remnant machinery &amp; huts, and workings of various eras, that offer information on the history of mining. Outstanding example of relationship between reef &amp; alluvial mining.</td>
<td></td>
</tr>
<tr>
<td>Existing Use</td>
<td>Hut provides emergency shelter</td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>Via Grey Mare Track (Aust Alps Walking Track)</td>
<td></td>
</tr>
<tr>
<td>Tourism Potential</td>
<td>Medium. Has some potential for interpretation as a cultural and geological site, on the Australian Alps Walking Track. Has management constraints because of remoteness of site.</td>
<td></td>
</tr>
<tr>
<td>Assessed by</td>
<td>Rob Kaufman</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>November 2001</td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>Name</td>
<td>MAUDE &amp; YELLOW GIRL MINE</td>
</tr>
<tr>
<td>----</td>
<td>------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Other Names</td>
<td>Includes Yellow Girl Mine, and workings on Maude &amp; Homeward Bound reefs.</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>The three component sites are at Glen Valley, and along Mt Wills Creek near its junction with the Big River.</td>
<td></td>
</tr>
<tr>
<td>Map Ref</td>
<td>541280E, 5918770N (1941 plant)</td>
<td></td>
</tr>
<tr>
<td>M’ment Status</td>
<td>Mining licences within Mt Wills HA</td>
<td></td>
</tr>
<tr>
<td>Site History</td>
<td>Gold-bearing quartz reefs were worked at Mt Wills from 1891. The Yellow Girl, Maude &amp; Homeward Bound reefs were opened in 1892, and by the end of the decade were amalgamated under one company. The Maude &amp; Yellow Girl Co was formed in 1931, and erected new plant. In 1941 the company erected a new battery and worked till 1952. Other parties then worked until 1967. 103,556 oz of gold were produced by 1952.</td>
<td></td>
</tr>
<tr>
<td>Site Description</td>
<td>3 sites: The No 5 Adit site consists of a large, partly-quarried mullock dump, large adit, large workshop with generating plant, smaller machinery shed, and abundant scrap mining plant. The 1931 machinery site consists of an adit &amp; mullock dumps, and a number of joined sheds containing remnant machinery &amp; engines, including a large Pelton wheel. The 1941 plant consists of a large battery shed (containing 20-h battery, jigs, Pelton wheel plant etc), ore bins, cone crusher, conveyor belt, extensive sand dam, scrap machinery &amp; plant, etc.</td>
<td></td>
</tr>
<tr>
<td>Interpretation Of Features</td>
<td>The features show the lowest tunnel workings on the reef (No 5 Adit), and a succession of plants (machinery sites) where processing took place. Power supply can be seen in two large Pelton wheel plants, and associated water race, piping etc.</td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>Condition of buildings at 1931 site is poor, and they are probably beyond simple repair. At 1941 site, main building is in fair condition, except for rear wall, which is being threatened by collapsed ore bins behind. Machinery at all sites is in fair-good condition. Buildings at No 5 Adit are in fair condition.</td>
<td></td>
</tr>
<tr>
<td>Threats</td>
<td>Major threats are continued deterioration of structures, fire, vandalism, and theft.</td>
<td></td>
</tr>
<tr>
<td>Identified Public Risk</td>
<td>Open mine workings (not inspected or assessed), structural integrity of buildings.</td>
<td></td>
</tr>
<tr>
<td>Historic Themes</td>
<td>3.4.1 Mining (Utilising natural resources).</td>
<td></td>
</tr>
<tr>
<td>Significance</td>
<td>State. Highest producing reef mine in eastern Victoria, outside Walhalla-Woods Point belt. Scientific importance for the range of intact buildings, machinery &amp; technologies (including flotation).</td>
<td></td>
</tr>
<tr>
<td>Existing Use</td>
<td>Current Mining Licence/s</td>
<td>Access</td>
</tr>
<tr>
<td>Tourism Potential</td>
<td>High. Sites easily accessible from Omeo Highway, and has high tourism potential for presentation as a major &amp; well-preserved gold mining operation.</td>
<td></td>
</tr>
<tr>
<td>Assessed by</td>
<td>Rob Kaufman</td>
<td>Date</td>
</tr>
<tr>
<td>ID</td>
<td>Name</td>
<td></td>
</tr>
<tr>
<td>----</td>
<td>-----------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MT MORAN MINE</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Names</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In gully at head of Wombat Creek, below (east of) Omeo Highway and about 1km north of Sunnyside turn-off.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Map Ref</th>
<th>M’ment Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Junction of creek &amp; Omeo Hwy)</td>
<td>Mt Wills Historic Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Site History</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Workings on the Mt Moran lode were described by Rosales in 1894, when a 54’ shaft had been dug, and a lower adit commenced. A crushing of 11½ tons had yielded 69 ounces of gold. Eventually 3 adit levels were driven into the reef, and the mine produced 7357 ounces of gold from 3585 tons of ore between 1894 and 1915. This mine was the lowest on the Sunnyside field.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Site Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The site consists of the mine workings above the Omeo Highway (three adits, mullock dumps, surface workings on the reef), and a machinery site below, on Wombat Creek. This site contains a single-cylinder portable steam engine, collapsed 10-h stamp battery, and two ore trucks on a track leading to the site.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interpretation Of Features</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The battery was used to crush ore from the workings above, and connection was probably by inclined tramway. The three adit levels represent different periods within the operation, but have not been visited to assess any archaeological features they may contain.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condition</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Surviving machinery relics are in fair-good condition. The site is presently overgrown with blackberries (2001).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Threats</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Surviving fabric is quite durable.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Identified Public Risk</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Not assessed.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Networks</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunnyside township site, other quartz-mining sites at Sunnyside,</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Historic Themes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4.1 Mining (Utilising natural resources).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Significance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>State. Scientific significance.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Existing Use</th>
<th>Access</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Short track (overgrown) from Omeo Highway</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tourism Potential</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High. The site has potential for presentation, because it is a good visual one, of high significance, with relatively easy access.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ref</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>“Geology of the Glen Wills &amp; Sunnyside Goldfields”, Crohn, 1958; Special Report (GSV), H Rosales, 1894</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessed by</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rob Kaufman</td>
<td>September 2001</td>
</tr>
<tr>
<td>ID</td>
<td>Name</td>
</tr>
<tr>
<td>----</td>
<td>--------------------</td>
</tr>
<tr>
<td></td>
<td>RED ROBIN MINE</td>
</tr>
</tbody>
</table>

**Other Names**
Includes North Red Robin & South Red Robin workings.

**Location**
Upper site: below Machinery Spur, east of Red Robin Gap; Lower site: in West Kiewa valley below.

**Map Ref**
513900E, 5911500N (mine)

**M’ment Status**
Bogong Unit, Alpine National Park

**Site History**
Discovered by lone prospector Bill Spargo at the end of 1940, the first, amazingly-rich yields triggered a rush to the high country, with all available country pegged out. Spargo worked rich stone till 1952, when he sold out to the Staffs, of Harrietville. The Harris’ took over from 1957, and in 1966 sold to the Livingstone bros, who erected a battery & buildings at the lower site. K Harris has operated the mine since 1978. Approx 10,000oz production.

**Site Description**
There are two major sites. The upper site near Machinery Spur contains the mine workings (4 adits, stopes & surface workings), Spargo’s hut, sheds, tramways, hut sites, battery site, sand dam with rock retaining wall, etc. The lower site in the valley below contains the battery shed (with 5 [10] head battery, plate tables, Wilfley table & Berdan pan), accommodation huts, storage huts, generator shed, jaw crusher, sand dams etc.

**Interpretation Of Features**
The features, preserved by the continuation of mining at the site, show the full flow of materials from the mine to the treatment plant, and through the treatment plant to the tailings dams. Occupation sites from various eras are preserved at the mine & treatment plant, and minor adaptations to Alpine conditions are visible.

**Condition**
Condition of buildings, machinery etc ranges from good to fair, and is presently maintained in operational (usable) condition by the licensee (2001).

**Threats**
Principle threats are natural deterioration of non-durable fabric; wildfire; vandalism & theft; heavy snow-drifts.

**Identified Public Risk**
Major risk environments are open mine workings; stability of structures; risks associated with machinery.

**Networks**
Red Robin Mine – Machinery Spur track – Spargo’s Hut (Swindlers Spur) – Mt Hotham.

**Historic Themes**
3.4.1 Mining (Utilising natural resources); 5.1 Working in harsh conditions; 3.3.3 Prospecting for precious metals; 8.11 Making Australian folklore.

**Significance**
State (included in Victorian Heritage Register, VHR No 1881). Has scientific significance (range of well-preserved features), historical significance (triggered last ‘gold rush’ in Victoria), and historical associations (Spargo, and the publicity surrounding the discovery).

**Existing Use**
Operating gold mine

**Access**
Via West Kiewa Fire Track from Mt Beauty, or via Machinery Spur from Mt Loch Carpark.

**Tourism Potential**
High. The Red Robin has high potential for presentation and introduction of tourism, and possible adapted use as an interpretive centre.

**Ref**

**Assessed by**
Rob Kaufman

**Date**
12 December 2000
<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>CHAMPION MINE BATTERY SITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Names</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>In Champion Creek, downstream of bottom adit of the Champion Mine.</td>
<td></td>
</tr>
<tr>
<td>Map Ref</td>
<td>509350E, 5912680N</td>
<td>M’ment Status Bogong Unit, Alpine National Park</td>
</tr>
<tr>
<td>Site History</td>
<td>The Champion Reef was discovered in 1868, and was worked until 1874, giving good returns for several owners. Recorded production was about 2000 ounces, but estimates ranged to over 7000 ounces. The mine was reworked from 1920-25, by the Champion Company, and again in the 1940’s by a local syndicate. Later production is not known. Three adits were driven to work the reef. The sequence of processing plants is not known.</td>
<td></td>
</tr>
<tr>
<td>Site Description</td>
<td>The site consists of a cutting into the hillside beside Champion Creek, that contains the archaeological remains of an early Cornish battery. Also visible is a water wheel pit, a hut site with stone fireplace ruins, and sundry scrap metal associated with the treatment works.</td>
<td></td>
</tr>
<tr>
<td>Interpretation Of Features</td>
<td>It is possible that the site contains the complete iron-work of a Cornish battery, but this could only be established by excavation of the site. The battery appears to have been originally erected to crush for an upper adit of the Champion on the hillside above (not visited). Connection was probably by inclined tramway. The battery is probably the earliest one erected at the mine, c.end of 1868.</td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>The site is being rapidly invaded by blackberries, and is not easily seen. Visible ironwork (cast-iron pieces) appears to be in good condition. The hillside above the machinery site has slumped, burying some of the area. No buildings or other structures remain.</td>
<td></td>
</tr>
<tr>
<td>Threats</td>
<td>There are few threats to the fabric of this place; cast-iron relics are durable, but some iron pieces are rusting. The site is very remote and difficult to access, and threat of pilfering is low</td>
<td></td>
</tr>
<tr>
<td>Identified Public Risk</td>
<td>Low. Site unlikely to be visited because of difficulty of access.</td>
<td></td>
</tr>
<tr>
<td>Networks</td>
<td>Champion Mine battery site – Champion Mine adits &amp; surface workings – Razorback mining track – Harrietville.</td>
<td></td>
</tr>
<tr>
<td>Historic Themes</td>
<td>3.4.1 Mining (Utilising natural resources).</td>
<td></td>
</tr>
<tr>
<td>Significance</td>
<td>Mine – Regional; Battery – possibly State or National, depending on completeness.</td>
<td></td>
</tr>
<tr>
<td>Existing Use</td>
<td>None</td>
<td>Access No tracks – former mine track access impassable; easiest access is off Champion Spur.</td>
</tr>
<tr>
<td>Tourism Potential</td>
<td>Low, because of the isolation of the site, difficulty of access, and lack of strong visual qualities.</td>
<td></td>
</tr>
<tr>
<td>Assessed by</td>
<td>Rob Kaufman &amp; Andrew Swift</td>
<td>Date November 2001</td>
</tr>
<tr>
<td>ID</td>
<td>Name</td>
<td>RAZORBACK MINE</td>
</tr>
<tr>
<td>----</td>
<td>------</td>
<td>---------------</td>
</tr>
<tr>
<td>Other Names</td>
<td></td>
<td>Razorback Syndicate Mine</td>
</tr>
<tr>
<td>Location</td>
<td></td>
<td>Workings straddle the Razorback, north-west of Mt Hotham, and the battery is situated in a gorge to the west.</td>
</tr>
<tr>
<td>Map Ref</td>
<td></td>
<td>M'ment Status</td>
</tr>
<tr>
<td>Location</td>
<td></td>
<td>Bogong Unit, Alpine National Park</td>
</tr>
<tr>
<td>Site History</td>
<td></td>
<td>The Razorback Reef was discovered in 1893 by the Harrietville Prospecting Association. It was wide, long, and carried good gold at the surface. In 1895, a Mines Dept track was cut to the mine, from the Ovens valley. The battery &amp; tramway networks were constructed in 1897, but crushing was interrupted by water shortages. Produced about 600oz of gold, but generally proved disappointing. Last recorded use of battery was about 1904.</td>
</tr>
<tr>
<td>Site Description</td>
<td></td>
<td>The site is extensive, covering mine workings (trenching, adits etc) that straddle the Razorback ridge, a network of inclined &amp; level tramways, water races, and the Razorback battery site. The battery site is situated in a gorge about a kilometre below the Razorback, and contains a standing 10-h battery, Pelton wheel &amp; piping, remnants of (curvilinear?) tables, stone blacksmith’s forge, anvil, and probable hut sites. Remnants of at least one inclined tramway headsheave have been located, but several more probably exist. Site needs more investigation.</td>
</tr>
<tr>
<td>Interpretation Of Features</td>
<td></td>
<td>The Razorback Mine shows a complex set of features (level &amp; inclined tramways) connecting the mine workings near the ridge to the battery, at the closest position to the mine with sufficient water for power &amp; crushing purposes. The complexity is dictated by the topography. The delivery pipe for the Pelton wheel is buried for its entire length, to stop freezing in winter.</td>
</tr>
<tr>
<td>Condition</td>
<td></td>
<td>The battery is in good, standing condition. The Pelton wheel is broken but complete. Only the metal parts of the concentrating tables survive.</td>
</tr>
<tr>
<td>Threats</td>
<td></td>
<td>Falling trees may propose threat to integrity of battery. Theft &amp; vandalism not seen as major threats, because of difficulty of access to site.</td>
</tr>
<tr>
<td>Identified Public Risk</td>
<td></td>
<td>Steep topography is a risk environment. Mine workings have not been fully recorded to establish risk, but they are unlikely to be visited by passing hikers, because of high difficulty of access. Risk considered low.</td>
</tr>
<tr>
<td>Historic Themes</td>
<td></td>
<td>3.4.1 Mining (Utilising natural resources); 5.1 Working in harsh conditions; 3.3.3 Prospecting for precious metals.</td>
</tr>
<tr>
<td>Significance</td>
<td></td>
<td>Nominally Regional, but has potential for State significance (based on complexity of tramway network &amp; surviving machinery) if a survey reveals sufficient surviving fabric. Scientific significance, and some historical significance as an 1890’s find resulting from government-sponsored gold prospecting.</td>
</tr>
<tr>
<td>Existing Use</td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>Access</td>
<td></td>
<td>No track access is available, and the site is very difficult to access, through thick scrub.</td>
</tr>
<tr>
<td>Tourism Potential</td>
<td></td>
<td>Low-Medium. The site is presently poorly known, and any potential for presentation &amp; visitation would be limited by need for considerable new access infrastructure. The battery site has exceptional visual qualities (natural &amp; cultural).</td>
</tr>
<tr>
<td>Ref</td>
<td></td>
<td>“The Harrietville Goldfield”, W Bradford, 1903 (Bulletin 11 GSV); sundry “Alpine Observer” articles 1893-1904</td>
</tr>
<tr>
<td>Assessed by</td>
<td></td>
<td>Rob Kaufman &amp; Andrew Swift</td>
</tr>
<tr>
<td>Date</td>
<td></td>
<td>October 2001</td>
</tr>
<tr>
<td>ID</td>
<td>Name</td>
<td>Other Names</td>
</tr>
<tr>
<td>----</td>
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</tr>
<tr>
<td></td>
<td>TEMPLATE</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX 2

SAMPLE HERITAGE ACTION PLANS

BEGELHOLE LODE, SNOWY RIVER NP  p 87
EMPERESS MINE, KOSCIUSKO NP  
GRANT TOWNSHIP, GRANT HA  97
JOKERS FLAT DIGGINGS, DARTMOUTH UNIT, ALPINE NP  101
KIANDRA, KOSCIUSKO NP 
MONARCH MINE, BOGONG UNIT, ALPINE NP  113
SOUTH BLOOMFIELD & ELAINE MINE, KOSCIUSKO NP  121
YORKIES DIGGINGS, KOSCIUSKO NP  129

& SUNDRY SITE PLANS

THREDBO DIGGINGS, KOSCIUSKO NP  p 133
STAMP BATTERY, GOLDSEEKERS TRACK, KOSCUisko NP  134
LOBBS HOLE COPPER MINE, KOSCIUSKO NP  135
BRANDY CREEK MINE, BOGONG UNIT, ALPINE NP  136
MAUDE & YELLOW GIRL MINE, MT WILLS HA  137
APPENDIX 2: HERITAGE ACTION PLANS & SUNDRY SITE PLANS

The following eight sample Heritage Action Plans have been compiled to provide guidance in the management of historic mining sites in the Australian Alps National Parks.

Please note that for sites/landscapes where conservation & presentation works are proposed, the abbreviated recommendations may not be sufficiently developed to institute works.

A range of sites have been chosen, covering various types of mining and situations. For the purposes of this report, emphasis has been placed on sites for which management intervention has been recommended. However, sample plans 1 & 2, recommending no management intervention, will be typical of treatment of the vast majority of mining sites/landscapes in the Australian Alps National Parks. The sites/landscapes selected are:

1. **A small, primary-orebody mine** (North Deddick Company silver-lead workings, Snowy River NP & Cobberas-Tingaringy Unit, Alpine NP):
   Typical treatment for small quartz and base-metal mines that are of local cultural heritage significance, and do not retain any machinery, equipment or built infrastructure in their fabric.

2. **Generic, alluvial diggings of limited extent** (Yorkies Diggings, Kosciusko NP):
   Typical treatment for generic alluvial diggings, in remote areas, or of limited extent, and of low cultural heritage significance.

3. **A large, high-altitude hydraulic-sluicing hole** (Empress Mine, Kosciusko NP):
   Typical treatment for presentation of large sluicing holes.

4. **Low-altitude alluvial diggings** (Jokers Flat sluicing area, Dartmouth Unit, Alpine NP)
   Typical treatment for presentation of alluvial diggings.

5. **Complex quartz mining sites** (Monarch Mine, Bogong Unit, Alpine NP)
   Example of the treatment for presentation of a complex primary-orebody mine, containing a variety of features including relic machinery. Heritage Action Plans for these types of sites will vary considerably according to the range of features, significance and site constraints.

6. **Mining cultural landscape** (Grant Township site, Grant Historic Area)
   Example of treatment of a mining landscape that requires some regular management intervention.

7. **Mining cultural landscape** (Kiandra, Kosciusko NP)
   Example of treatment of a mining landscape that requires little management intervention. This plan includes concepts for further site presentations of alluvial diggings.

8. **Complex alluvial mining area** (South Bloomfield & Elaine mines, Kosciusko NP)
   Example of linking sites.

The sample Heritage Action Plans have been prepared according to the Guidelines to the Burra Charter. For some important mining sites/landscapes that are not included in the above list, site gazetteers are included in Appendix 1.
Additional site plans generated during the study have been included at the end of Appendix 2. The sites covered are:

1. Thredbo Diggings, Kosciusko NP;
2. Stamp battery on Goldseekers Track, 3-Mile Dam, Kiandra, Kosciusko NP;
3. Lobbs Hole Copper Mine, Kosciusko NP;
4. Brandy Creek Mine, Bogong Unit, Alpine NP;
5. Maude & Yellow Girl Gold Mine, Mount Wills Historic Area, Vic.
PART 1 - DESCRIPTION

NAME:
North Deddick Company workings, on Begelhole Lode (also called North Mt Deddick Lode), Deddick Silver-Lead Field.

MANAGEMENT UNIT:
Upper workings in Cobberas-Tingaringy Unit of the Alpine National Park; lower workings in Snowy River National Park.

LOCATION:

General Description: Workings straddle the Gelantipy-Bonang Rd, approximately 4 road kilometres west of McKillops Bridge.

SITE DESCRIPTION:
(see also attached Site Plan & Photography)

The workings are in a gully, and those visited consist of:
(a) An upper adit (tunnel), said to be 100m long, accessed by a short track from the Gelantipy-Bonang Road. Log sleepers are visible inside the adit. This adit has a medium-sized mullock dump, and a short side track used to load material excavated from the mine, for removal from the site. No hut sites are visible, although the top of the mullock dump afforded a considerable flat area for constructions.
(b) A small shaft (or tunnel?) in the gully below the road. Some collapsed timber work is visible, and a small amount of mullock.
Surface workings on the lode and another adit level (indicated in 1907 report, and perhaps the ‘shaft’ referred to above) may exist, but were not located.

CONDITION:
The adit appears to be in good condition, and is open. The mine tracks are clear, and the upper adit mullock dump is intact. The small shaft (or tunnel) below the road is in poor condition, and most of the mullock appears to have been removed.

THREATS:
There are no threats to the upper site. The lower site may be at risk of burial during future road-widening works.

PART 2 – CONSERVATION ANALYSIS

SITE HISTORY:

Background:
This mine is on the western end of the Mt Deddick Silver-Lead Field. Silver/lead/copper lodes were first noted here in the early 1870’s, but development did not occur until the first lease was pegged in 1896. By 1897, over 60 sq km of country had been pegged out by rapidly-formed mineral exploration companies & syndicates, and prospecting works began. Hopes were high, and the general feeling was that this area would become a major base-metals mining field. A camp (mining settlement) was briefly established on the east side of the Snowy
River, at a location approximately opposite the Begelhole lode workings. Several companies raised small amounts of ore, but the boom had collapsed by 1900. Some minor workings were undertaken after 1900.

Begelhole Lode:
Workings were opened on the Begelhole Lode by the North Deddick Co in the early days of the field. By 1907, an adit level 100 feet long and 40 feet above the river level had been dug, and another adit 2½ chains higher up the gully, 60 feet long and 140 feet above river level (this may be the upper adit mapped in this project). The company was working quartz veins in which galena and copper pyrites occurred, as well as traces of green copper carbonate. The North Deddick Co’s workings were said to have probably been the longest lived on the field, and the upper adit is said to have reached 100m in length (Cochrane: 1982). No production from the workings has been recorded.

The road appears to have originally been Mines Department Track No 239, cut sometime between the start of 1898 and October 1899, connecting Turnback to the Snowy River.

References:  
"Mount Deddick Silver-Lead Field", 1897 (Australian Mining Standard, 1897, p2427);  
"Mount Deddick Silver-Lead Field", J Stirling, 1898 (Australian Mining Standard, 13, pp2934&2958);  
"Further Report on Geological Survey of Mount Deddick Silver-Lead Field", J Stirling 1899 (Progress Reports of the Geological Survey of Victoria, 4-5, pp3-5);  
"Preliminary Report on Mount Deddick Silver-Lead Field", J Stirling, 1899 (Progress Reports of the Geological Survey of Victoria, 4-5);  
"Map of the Eastern Portion of the Colony of Victoria, Showing Mining Tracks Cut by the Department of Mines", 1904 (Victorian Department of Mines);  
"Mount Deddick and Accommodation Creek", E J Dunn, 1907 (Records of the Geological Survey of Victoria, Volume III Part 1, pp75-79);  

CHANGES TO THE FABRIC OVER TIME:

No built infrastructure (sheds, huts etc), machinery, equipment etc remains at the site, and any that did exist were presumably removed post-mining. The access track to the adit and the flat adjacent to the adit entrance show evidence of bulldozer use, possibly related to more recent mineral exploration activities.

SITE NETWORKS:

The workings on the Begelhole Lode are part of a network of mining sites within the Deddick Silver-Lead Field. This site is isolated from the bulk of the workings, which occur to the east of the Snowy River.

COMPARATIVE ANALYSIS:

The North Deddick Company’s workings on the Begelhole Lode show no rare or interesting mining features that would elevate the site’s significance, and are typical of small, primary-orebody workings that are abundant throughout the mountain mineral fields (including goldfields) of eastern Victoria.

CULTURAL HERITAGE SIGNIFICANCE:

Local (low historical, scientific, archaeological and aesthetic values).

PART 3 – CONSERVATION POLICY

GENERAL POLICY:

The site does not show any significant features that would require active management to maintain. The historical value of the site was as an incremental contributor to the Deddick Silver-Lead Field, and its heritage
value lies in the simple visual evidence it shows of former operations. Therefore the general policy will be to allow the natural processes of decay to operate at the site, and to avoid inappropriate management action that would remove evidence of the former operation of the mine.

CONSERVATION OBJECTIVES:

Retain visual evidence of former operation of mine, as part of the Deddick Silver-Lead Field.

CONSERVATION PROCESSES:
(Terms as defined in the Burra Charter)

Preservation: Avoid unnecessary or inappropriate management actions that would impact adversely on the historic fabric.

Reconstruction: Would do nothing to further reveal significance, and therefore not recommended.

Restoration:

Adaptation: The site is isolated from the rest of the field, and is not an appropriate place to provide historical interpretations of the field, or to encourage visitation.

PART 4 – ACTION PLAN:

MANAGEMENT OBJECTIVES:

To retain evidence of the former operation of the mine, by application of the Conservation Policy.

MANAGEMENT ISSUES:

Public risk: While the workings are close to the road and the tunnel is open, public risk is not seen as an issue requiring action, because the site is unlikely to attract visitation.

Future road-widening works: The lower site may be at risk of burial in future road-widening works. The lower site contributes only a small proportion of the visual values of the overall site. Given the importance of the road as an entry route to this area of the Snowy River valley, there are insufficient heritage values to justify any major alterations to future roadworks to accommodate preservation of this section of the site. The recording attached to this document is sufficient, should the lower site be buried in the future.

RECOMMENDED DEVELOPMENT:

No conservation or development works are recommended for the site.

Compiled by LRGM - Services
13 December 2001
as part of the
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APPENDIX TO HERITAGE ACTION PLAN

SITE PHOTOGRAPHY:

Lower shaft (adit?).

Lower shaft (adit?) looking downhill. Remnant mullock at right.

Entrance to upper adit.

Upper adit mullock dump, looking uphill.

SITE PLAN
NORTH DEDDICK COMPANY’S WORKINGS ON BEGELHOLE LODE
Sketch only – scale approximate.

Gelantipy-Bonang road

Collapsed shaft (adit?)

Mullock

Adit entrance (log sleepers visible inside)

Bulldozed heap

Loading ramp

Mullock dump

Access track

Gully

623270E
5894330N

Cobberas-Tingaringy Unit Alpine NP

to McKillops Bridge

Snowy River NP

0 30m

Snowy River

N
SAMPLE HERITAGE ACTION PLAN – EMPRESS MINE

PART 1 - DESCRIPTION

NAME:
Empress Mine (also known as Lette’s 9-Mile Diggings, in 1918).

MANAGEMENT UNIT:
Kienda Historic Area, Northern Region, Kosciusko National Park, NSW.

LOCATION:
General Location: Head of Scotch (Scotts) Gully, 9-Mile field, just below Tabletop Mountain Track.

AMG Coordinates: 633910E, 6018780N (top lip of open cut) AGD 1966.

SITE DESCRIPTION:
(refer also Site Plan, attached)

The site consists of a huge, bowl-shaped sluicing hole, cut into the hillside. At the top end of this cut, an earth & rock walled storage dam is installed, fed by water races. A number of subsidiary (or earlier) water races feed into the cut, along the side faces. Inside the lower end of the cut, several substantial stacked piles of basalt boulders are visible. At the bottom end of the cut, a deep tail race has been excavated through heavily-weathered, bright-orange bedrock. The lower end of the cut is surrounded by earlier, intensive sluicing works, characterised by stacked piles of basalt rocks. The associated main tunnel (refer Site History, below) was not inspected. The entrance may be at one of the large dumps that shows in Scotch Gully, in aerial photography of the area.

CONDITION:
The condition is generally good. There has been some slumping of the high faces of the cut, sedimentation in the base of the cut, and encroachment of native vegetation.

THREATS:
The heritage features of the Empress mine are robust. Erosion of the high faces will continue, as will the encroachment of native vegetation. These are not seen as major threats to the significance or appreciation of the place.

PART 2 – CONSERVATION ANALYSIS

SITE HISTORY:
The 9-Mile deposits were discovered early in 1860, and a substantial, short-lived township developed. The Empress sluicing claim was taken up in the 1860’s or early 1870’s, and the sluicing face was 130’ deep by 1876. In 1881, it was the deepest on the Kiandra field. Between 1882 and 1884, the site was developed for hydraulic sluicing, with the cutting of new, substantial head races. Hydraulic sluicing continued until the mid 1890’s, when the depth of wash had reached 250’, and was too difficult to work by sluicing. By 1898, a tunnel had been driven 900’ into the hillside. This was extended to over 2000’ in later years. Sluicing continued until 1907, when operations were suspended. The mine was worked intermittently from 1915 to 1919, when the mine was abandoned. The last recorded gold production from the 9-Mile diggings was in 1926.
CHANGES TO THE FABRIC:

The Empress open cut obliterated all traces of earlier ground sluicing & tunnelling on the site. The workings appear undisturbed since mining ceased, other than through the operation of natural processes.

SITE NETWORKS:


COMPARATIVE ANALYSIS:

Large-scale hydraulic sluicing was a common form of gold-mining at most fields in Australia where water at sufficient pressure could be provided, particularly from the 1880’s onwards. The Empress is one of the stronger visual sites, because of its immense bowl shape, and views over the southern NSW Alps. It also retains evidence of associated infrastructure such as dam, water races, etc.

CULTURAL HERITAGE SIGNIFICANCE:

State.
Has scientific significance as an outstanding visual example of this widespread & important form of gold mining (hydraulic sluicing), and its remnant ancillary features (race lines, dam, tail race, rock piles etc) are sufficient to interpret the operations of these types of mines;
Has regional historical significance as the largest-scale sluice workings in the broader Kiandra goldfield, and it was at times the largest producer (particularly after 1900).

PART 3 – CONSERVATION POLICY

GENERAL POLICY:

The Empress sluice hole is the most spectacular visual feature of the 9-Mile diggings. The visual aspects of the site are not threatened, and the regrowing vegetation is key part of the ambience of the site, and the sense of abandonment.

The general policy will be to allow natural processes to operate at the site, and avoid inappropriate management actions that would adversely impact on the cultural heritage significance of the place.

CONSERVATION OBJECTIVES:

The conservation objective of the Empress Mine is to protect the prominent visual features of the place from damage. These features are the main pit, dam, tail race, rock heaps & water races. It is acknowledged that the overall aspect will change gradually as natural processes continue to operate at the site.

CONSERVATION PROCESSES:
(terms as defined in the Burra Charter)

Preservation: Preservation will be the main focus of conservation, and will consist of avoiding inappropriate, harmful management action, rather than the application of preservative processes.

Reconstruction: Not recommended.

Restoration: Not recommended.
**Adaptation:** Installation of low-level historical interpretations & visitor access facilities would be compatible with the maintenance of the heritage values of the site.

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**PART 4 - MANAGEMENT PLAN:**

**MANAGEMENT OBJECTIVES:**

The management objectives for the Empress Mine are:

- To manage the site in accordance with the Conservation Policy outlined, to maintain the cultural heritage significance of the site;
- To avoid inappropriate management actions that would adversely impact on the cultural heritage significance of the site;
- In the longer term, to develop the site for visitor access, and provide a safe, educational and enjoyable visitor experience.

**MANAGEMENT ISSUES:**

**Public Risk:** The main risk is associated with the steep, upper faces of the open cut. The following is recommended in association with any future presentation of the site:

- Provide adequate safety railing at viewing area/s;
- Keep additional tracks away from edge of open cut;
- Do not encourage entry to pit;
- Install appropriate signage, warning of danger of steep faces.

**Heritage Management:** No management action for heritage conservation is required.

**RECOMMENDED DEVELOPMENT:**

Presentation of the Empress Mine is considered desirable, because of its significance, and the location of the top lip of the open cut on the edge of the Tabletop Mountain Trail, part of the Australian Alps Walking Track. Presentation would be best effected as part of a longer “heritage trail” in the Kiandra Historic Area. This would ensure that visitors to the sites could experience other aspects of the rich mining heritage of the area along the way, including the 9-Mile diggings, Elaine Mine & South Bloomfield, 4-Mile diggings & hut, North Bloomfield (optional), etc. The track would communicate to visitors that there is considerably more to the Kiandra goldfield than the diggings at Kiandra, and, remote from the Snowy Mountains Highway, would provide a better appreciation of the conditions under which mining took place.

Construction of such a track is recommended, but not considered to be a Stage 1 priority. In terms of future presentation of the mining cultural heritage of the Kiandra Historic Area, it would be the next logical development after Stage 1 recommendations at Kiandra. Recommendations are:

- Include the Empress Mine as part of an extended heritage trail, that includes the 9-Mile diggings, Elaine & South Bloomfield mines and the 4-Mile diggings & Hut;
- As a minimum, provide a viewing area beside the Australian Alps Walking Track. This should be equipped with a suitable safety rail, basic interpretations on a small board, and a sign warning of the danger of steep faces. Manage vegetation only in the immediate vicinity of the viewing area, to maintain clear viewlines;
- Examine options for a second viewing area in the vicinity of the tail race, and suitable track access.

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*Compiled by LRGM - Services*

*15 December 2001*

*as part of the*

**Australian Alps Mining Heritage Conservation & Presentation Strategy**

93
APPENDIX TO HERITAGE ACTION PLAN

SITE PLAN

EMPIRESS MINE & 9-MILE DIGGINGS

KIANDRA HISTORIC AREA,
KOSCIUSKO NATIONAL PARK,
NSW

Based on site visit, Oct 2001
Drawn R Kaufman,
LRGM - Services
APPENDIX TO HERITAGE ACTION PLAN

SITE PHOTOGRAPHY

Looking down into Empress sluice hole, from top lip.  
(photo R Kaufman, Oct 2001)

Looking up into Empress sluice hole, through tail race.  
(photo R Kaufman, Oct 2001)

Piles of rock below Empress sluice hole, from earlier ground sluicing.  Empress tail race at rear (orange).  (photo R Kaufman, Oct 2001)

Rockwork inside front wall of dam above Empress sluice hole.  (photo R Kaufman, Oct 2001)
PART 1 - DESCRIPTION

NAME:
Grant township (earlier known as Skye or Mt Pleasant, on site of Isaac’s Shanty, an early grog shop).

MANAGEMENT UNIT:
Grant Historic Area, Vic.

LOCATION:

General Location: On McMillans Track (Talbotville Road), approximately 5km west of the Dargo High Plains Road.


SITE DESCRIPTION:
The Grant township site is visible from several points on the Dargo High Plains Road, and shows as an intriguing window of cleared land high on a spur, in an otherwise seamless wilderness. The Grant road, from the Dargo High Plains Road, approximately follows a long, heavily-timbered spur line. Some distance after the Grant cemetery, a short side-track leads into the town site, and the change from forested to cleared land is abrupt. The town site covers several hectares, and the open area appears well-defined, with sharp boundaries. No built structures remain of the former town. The general layout of the town can be seen in the open site, and some benched, building sites are visible. Chimney rubble and stone footings remain at some building sites. A few exotic plant species growing within the town area are reminders of the former occupation. A few mullock dumps from small quartz mines can be seen, within & adjacent to the town area. An information shelter with historical interpretations has been installed at the lower end of the site, and some key building sites are signposted.

CONDITION:
The site is generally in good condition, notwithstanding that only archaeological fabric remains. Regrowth has claimed some of the former town area.

THREATS:
Advancing natural regrowth is the major threat to the open landscape of the former-township site. Archaeological potential may be at threat of further pilfering by bottle collectors etc, and evidence of previous activity is visible at the site. Existing small mines within and adjacent to the town site are unlikely to attract further exploration or mining activity.

PART 2 – CONSERVATION ANALYSIS

SITE HISTORY:
Quartz reefs were discovered in the Crooked River goldfield in 1864, by track-cutters under the direction of Angus McMillan. This breathed new life into the flagging, alluvial-based townships of the field. Four reefs were opened at Mt Pleasant in July of that year, and a township rapidly developed. The first survey was in August 1864, and resulted in one of the town’s unusual features – a double main street. At the end of 1864, 180 quartz claims had been registered on the field. By February 1865, it was estimated that 700-800 people were in residence, and the name was changed to Grant, after the Commissioner for Lands, J Grant. By the end of 1865,
there were 15 hotels, numerous stores, banks, a newspaper office, and sharebrokers’, doctors’ & solicitors’ offices.

But the reefs that held such promise were found to be disappointing. Few held their rich surface values at depth, and the field ‘collapsed’ within a few years. Only the nearby Good Hope Mine proved to be successful over a long period, and it was probably the benefits afforded by this operation that enabled Grant to cling to life until the early 1900’s. By 1874, only 112 people lived in Grant. The school was closed in 1890, and the last residents left in 1916. By 1931, the few derelict buildings had disappeared.

SITE NETWORKS:

Grant - Grant Cemetery – McMillan’s Track - Good Hope & New Good Hope mines - other reef mines in the vicinity - Crooked River diggings & townships.

COMPARATIVE ANALYSIS:

Grant is one of dozens of gold towns in the mountains of eastern Victoria that did not survive the depletion of its gold resources. It was the largest gold town to exist in the Victorian section of the Alps National Parks & attached Historic Areas, but its heyday was very brief. From its establishment in 1864, it had seen its best days by 1867, and was virtually a ghost town from the mid-1870’s to the early 1900’s. In a sense, it is the quartz-mining equivalent of Kiandra, NSW, but on a smaller scale. Both places experienced rapid growth on the basis of the promise shown by the early discoveries, and both experienced equally rapid decline with failure of the orebodies to live up that promise.

CULTURAL HERITAGE SIGNIFICANCE:

Regional.
Has historical significance, as (briefly) one of the largest towns in eastern Victoria, and (briefly) the centre of the largest and most promising goldfield in Gippsland;
Has archaeological potential to reveal information on working & living conditions in (particularly) the mid to late 1860’s;
Has cultural landscape value.

PART 3 – CONSERVATION POLICY

GENERAL POLICY:

Grant township site is a place of reflection, where the empty space stands as evidence of the generally disappointing reefs that failed to sustain the early promise of the goldfield. It is also a poignant reminder of the ephemeral nature of mining and the communities that rely on it. Reconstruction of buildings would remove this ambience, disturb the archaeology, and impose a high level of management and maintenance.

Therefore the general policy will be to conserve the existing landscape, and preserve the archaeology of the place.

CONSERVATION OBJECTIVES:

• To retain the existing landscape, as visual evidence that something more substantial existed here in the past;
• To maintain the archaeological potential of the place.

CONSERVATION PROCESSES:

Preservation: Preservation of the open landscape can be achieved through active vegetation control. Inaction in vegetation control would result in the site being resumed into the surrounding forest, with subsequent loss of visual values, and appreciation of the scale & importance of Grant. Inappropriate management actions that disturb the archaeology of the place should be avoided. It is not feasible to provide daily monitoring of the place. Hence the present interpretations (evidence that the place is important & actively managed) and
increasing the visitation rates are probably the only realistic protection against inappropriate visitor actions that would disturb the archaeology of the place.

**Reconstruction:** Reconstruction is not recommended.

**Restoration:** Restoration is not generally recommended, and it is unlikely in any case that any displaced original fabric is still in existence. Restoration by removal of accretions may be a valid action, but would be limited to minor works such as exposure of building footings, etc.

**Adaptation:** The place is adapted for visitation, with the installation of signage and interpretations. Use of the open area for camping or other more intensive recreational activities is not recommended, because these may reduce or confuse the archaeology of the place, and affect visual qualities.

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**PART 4 - MANAGEMENT PLAN:**

**MANAGEMENT OBJECTIVES:**

- Actively manage the place for retention of the present open landscape;
- Provide a safe, informative and enjoyable visitor experience, through regular maintenance of the place, including maintenance, and possible extension, of historical interpretations.

**MANAGEMENT ISSUES:**

**Public Risk:** Not an issue in the town area, except for monitoring of risk associated with quartz mines in the vicinity.

**Heritage Management:** The remaining fabric is essentially archaeological, and robust (stone footings, benched hut sites, etc). Exotic trees and other plants associated with the town should be retained. Strategies may need to be adopted to prevent any aggressive exotic species spreading over the town site, or any exotic species spreading into the surrounding bushland.

**Landscape Management:** The retention of the open landscape of Grant is desirable in the longer term. The following is recommended:

- Institute a maintenance program, on a 2 to 5-year cycle, to remove tree and tall shrub (eg wattles) revegetation from the existing open area;
- Undertake removals by hand or chemical means. Machinery should not be used, in order that the archaeological record is not disturbed.

This work may be a suitable activity for a Friends-type group.

**RECOMMENDED DEVELOPMENT:**

The site is equipped with interpretations. While there may be opportunities to extend these, this is not seen as a priority. In the longer term, upgrade of the Talbotville road as far as the walking access to the Good Hope Mine, and provision of necessary conservation & interpretation works at the mine, would be seen as desirable to promote a better understanding of the existence of the Grant township.

Further uncovering of house footings etc may enhance the visual appreciation of the site.
APPENDIX TO HERITAGE ACTION PLAN

SITE PHOTOGRAPHY

View over Grant township site, Nov 2001

View over Grant township site, Nov 2001 (to right of above)

Grave at Grant Cemetery, Nov 2001
PART 1 - DESCRIPTION

NAME:

Jokers Flat diggings, King’s workings.

MANAGEMENT UNIT:

Dartmouth Unit, Alpine National Park.

LOCATION:

General Location: On the Big River at Jokers Flat camping area, on the east side of the Omeo Highway between Anglers Rest and Glen Valley.

AMG Co-ordinates: 542060E, 5910990N (refer attached Site Plan).

SITE DESCRIPTION:

The site consists of gold sluicing workings, beside the river in the camping area, and at a higher level on each side of the access track from the Omeo Highway. The diggings show typical features such as shingle heaps, low “canyon” diggings along shallow gold-bearing leads, water races, tail races etc (refer attached Site Plan). At the northern end of the area, several water races are visible crossing a former entry track, now closed. Thick scrub probably hides further features, and more alluvial sluicing works are likely to be found upstream and downstream.

A highly-visible, two-fingered mullock dump is situated on the south end of the flat. This is spoil from reef mining. The adit entrance has collapsed, and is not visible.

CONDITION:

The diggings are in fair condition, and can easily be seen from the access track, and from within the camping area, on the riverbank.

THREATS:

The workings are under little threat, except from weed or scrub incursions that may reduce their visibility, and inappropriate management action (eg waste from drain digging has been dumped in sluiced area beside river). Floods in the last century do not appear to have significantly altered the diggings.

PART 2 – CONSERVATION ANALYSIS

SITE HISTORY:

Alluvial gold diggings began on the Big River in about 1860, with the main workings targeting river terraces. The Big River was worked from the Mitta Mitta junction to above Mt Wills Creek. German and Chinese miners figured prominently in the goldfield.

A geological sketch map drawn in 1887 shows the workings at the south end of Jokers Flat (marked as “well grassed flats”) as Kings, and Kings Old Workings are marked on the opposite side of the creek. On the other side of the river, opposite the north end of the flat, Tetu’s Old Workings are marked (Sam Tetu). Williams & Chinese Workings are shown on both sides of the river, immediately upstream of the flat. Germans Old
Workings are marked further towards Middle Creek. The old mining track through the centre of Jokers Flat is also shown.

Production is not known. Good wages were being made in the 1860’s. Sam Tetu indicated that he got up to £20 (5 ounces) per week from his terrace workings. Reefs were opened in 1887-88, and a busy reefing area developed.


CHANGES TO THE FABRIC:

The old workings appear to be little disturbed since they were worked in the 1860’s – 1880’s.

SITE NETWORKS:

The Jokers Flat diggings is one of a series of sites along the Big River where sluicing for gold was undertaken.

COMPARATIVE ANALYSIS:

The diggings themselves are not of particular note. Alluvial gold diggings, consisting mainly of sluicing workings, are very common features along the rivers of the goldfields of the Victorian Alps. However, the accessible location of the Jokers Flat diggings on a major strategic road makes them valuable for interpretation purposes. Some well-preserved diggings with excellent visual properties and a greater range of features are in very remote areas (eg Upper Dargo, Wombat Creek, East Branch of the Ovens River, Cobungra River etc), and access is constrained. Other good areas are accessible, but only by 4WD vehicle, limiting their general availability (eg Crooked River, Dart River etc). Those on the Buckland River, Mt Buffalo NP, are “poor cousins” of surrounding sites outside the Park, and the best sites on the Gibbo River are on the opposite side of the river to the road, posing access difficulties. At Mt Wills HA, the extensive alluvial diggings (including hydraulic sluicing) near Glen Valley do not relate well to the principal historic theme of the Historic Area, quartz mining.

CULTURAL HERITAGE SIGNIFICANCE:

Local.

PART 3 – CONSERVATION POLICY

CONSERVATION OBJECTIVES:

- To retain the present visual aspects of the gold workings at Jokers Flat, that show features typical of river sluicing in mountainous areas of north-east Victoria;
- To further investigate the Jokers Flat area for other gold workings or related features that may contribute to the visual aspects of the place.

GENERAL POLICY:

The general policy will be to allow processes of natural rehabilitation to operate at the site, while ensuring that management practises do not adversely impact on the historic fabric. Weed control will be important in maintaining visibility of the mining features.

CONSERVATION PROCESSES:

(Terms as defined in the Burra Charter)

Preservation: The diggings should be preserved in their present form. This will involve elimination of management practises that would otherwise impact on the diggings.
Reconstruction: Not recommended

Restoration: Not recommended

Adaptation: The Jokers Flat diggings are suitable for installation of historical interpretations.

PART 4 - MANAGEMENT PLAN:

MANAGEMENT OBJECTIVES:

1. To interpret the Jokers Flat diggings, as a typical example of river sluicing in the Alps National Parks;
2. To care for the diggings, to ensure survival of their visual qualities in the longer term.

MANAGEMENT ISSUES:

Public Risk: Risk associated with the old workings is not seen as a major issue at Jokers Flat. The low banks formed by sluicing present similar risks to the natural river bank, and there are no particular inducements to climb over the old workings. This is unlikely to change significantly with installation of fairly low-level interpretations. No open shafts or tunnels were located during brief site inspections (Sept & Dec 2001).

Heritage Management: Eliminate management practices that would otherwise impact on the diggings. For example:

- Do not practise mechanical weed removal using bulldozers. Minor weed removal by use of appropriate herbicides may be used in future to maintain visibility of workings;
- Do not undertake new track alignments that would cut though diggings;
- Do not dump earth or other waste into mining cuts, etc.

Any tree removals within diggings (eg in response to assessed risk) should be effected without use of heavy machinery, and stumps should not be grubbed.

RECOMMENDED DEVELOPMENT:

Alluvial gold-mining interpretations should be installed at Jokers Flat. The suggested form is an information board or shelter (similar to that at the nearby Bundara River picnic ground). The suggested location is within the camping area, on the track side of the sluicing that contains the two well-preserved shingle heaps. The board should face the track. This board should:

- Present a brief history of the Jokers Flat & Big River diggings, including the high Chinese presence;
- Explain the mining method that produced the features (including diagrams/historical photographs);
- Contain a site plan showing the old workings (based on sketch plan, attached);
- Indicate that these diggings are typical of gold workings on rivers throughout the goldfields of the Alps National Parks;
- Contain links to other local & regional cultural sites that may be available for viewing.

Compiled by LRGM - Services
12 December 2001
as part of the
Australian Alps Mining Heritage Conservation & Presentation Strategy
APPENDIX TO HERITAGE ACTION PLAN

JOKERS FLAT
ALLUVIAL GOLD DiggINGS

Alpine National Park, Dartmouth Unit

(Sketch only – not to scale)

SITE PHOTOGRAPHY:

Sluice workings below entry track.
PART 1 - DESCRIPTION

NAME:

Kiandra township site & associated diggings. Includes Township Hill, New Chum Hill, Surface Hill, Kiandra cemetery, Pollocks Gully, Commissioners Creek, and sections of Bullock Head Creek & Eucumbene River.

MANAGEMENT UNIT:

Kiandra Historic Area, Northern Region, Koscuisko National Park, NSW.

LOCATION:

General Location: On Snowy Mountains Highway, 37km north-west of Adaminaby.

AMG Coordinates: 634800E, 6028850N (courthouse, approx).

SITE DESCRIPTION:

Kiandra is situated in the valley of the Eucumbene River, at its junction with Bullock Head Creek. Kiandra includes the township site, cemetery and various gold diggings. A summary description is contained within the following landscape description, indicating major cultural & natural features:

<table>
<thead>
<tr>
<th>PLACE</th>
<th>VIEWPOINT</th>
<th>KEY CULTURAL FEATURES</th>
<th>KEY NATURAL FEATURES</th>
</tr>
</thead>
</table>
| Kiandra   | Township Hill, up hill opposite Lodge: 634630E, 6028770N, (~200° vista, N) | Township:  
- Introduced trees  
- House sites  
- Yans store chimney  
- Some buildings  
- Main road  
New Chum Hill:  
- Large scars (hydraulic sluicing)  
Pollocks Creek, behind township:  
- Highly visible sluicing (stone heaps include quartz boulders) | Eucumbene River valley  
Tributary creeks, gullies  
Extensive grasslands (probably some cultural modification)  
High-level treed areas  
Long view to north |
|           |           | Surface Hill:  
- Water races  
- Scarring (surface)  
- Track traces  
Township Hill (foreground)  
- Cuttings & pebble heaps  
River flats  
- Ponds  
- Tailings, banks etc  
Roadways (former mining tracks), including Snowy Mountains Highway (Cemetery – not visible) |
CONDITION:

Township site: Consists primarily of archaeological fabric. The only early extant buildings are the courthouse & Matthews’ cottage, both of which have been significantly altered. Archaeological fabric severely disturbed in many sections below road, with NPWS’s apparent use of bulldozers during demolition of town buildings.

Diggings: Generally in good condition, although all machinery & equipment has been removed.

THREATS:

As part of the Kosciusko National Park, land-use pressures that would have potential to degrade the heritage values of area are considerably reduced, and there are few threats other than inappropriate management actions. The action of natural processes (erosion, revegetation, processes of decay, etc) have and will continue to degrade the heritage features, and the landscape will gradually alter. These processes are not seen as threats that require intervention, except in specific circumstances to retain the prominence, or even existence, of certain features.

PART 2 – CONSERVATION ANALYSIS

SITE HISTORY:

Gold was discovered at Kiandra in November 1859, by either the Pollock brothers, or Gillon & party. The rush started December 1859, and accelerated rapidly in early 1860, so that by April there were an estimated 10,000 miners on the diggings. Rich gravels were worked, and gold nuggets up to 400 ounce weight were found. The basalt-covered deep leads that were the source of the gold on the flats were first worked in early 1860, on New Chum Hill. Tunneling on these leads began in 1861. Numbers of Chinese miners arrived in mid-1860, but the population dropped over winter. The NSW government believed that Kiandra gold would help revitalise the state’s struggling economy, and lure large numbers of its citizens back from the pre-eminent Victorian diggings. During mid-1860, the government invested in considerable infrastructure development to cope with the anticipated, massive, post-winter exodus to Kiandra. Roads were constructed, and police stations with lock-ups & stables were established at regular intervals along all major roads to the diggings.

The expected rush never eventuated – the diggings were rapidly depleted. New and larger finds in NSW such as Lambing Flat attracted the diggers. 1860 was easily Kiandra’s peak year of gold production, with 67,687 ounces sent from the field. Significantly, two-thirds of this total had been sent by June of that year. Production in 1861 slumped to 16,565 ounces, and fell away rapidly from this. In September 1860, Kiandra had 14 hotels, 25 stores, 16 butchers, 13 bakers and 4 blacksmiths, as well as an array of public buildings, a far cry from the virtual ghost town that struggled on into the twentieth century. Mining was revived somewhat by the introduction of large-scale hydraulic sluicing in the early 1880’s, but returns were not of any great magnitude. The last production of any real note was from the introduction of a bucket dredge 1900, but its working life was short. The last recorded production from Kiandra was in 1937.

The early miners at Kiandra were using skis in 1861, the first record of their use in Australia. Annual “snowshoe races” were held, and Australia’s first ski club was formed at Kiandra in the late 1870’s or early 1880’s. For some years, Kiandra had a dressed ski-run above the old township, and is credited with the first T-Bar lift introduced to the Australian skifields. The old courthouse was converted into a ski lodge to accommodate patrons.

References: “Report on the Kiandra Lead”, E C Andrews, 1901 (Mineral Resources No 10, NSW Dept of Mines & Agriculture);
“Historic Kiandra”, Cooma-Monaro Historical Society, 1959;

CHANGES TO THE FABRIC:

As the township shrank after reaching its peak in 1860, buildings were gradually removed and materials salvaged. Other buildings were lost to fire. The nucleus of the town survived till the 1950’s, and after this the
derelict buildings gradually deteriorated. In the 1972, the NPWS removed a large number of derelict buildings. The remnants of Yans store collapsed some years later. Matthew’s cottage has been moved from its original position to accommodate roadworks, and has been renovated & extended. The old courthouse building has been radically altered.

Some early alluvial diggings were obliterated by later large-scale hydraulic sluicing (1880’s onwards) and bucket dredging (early 1900’s). The Snowy Mountains Authority removed an unknown amount of tailings and gravel for construction purposes in the late-1950’s to early 1960’s (New Chum Hill, probably Homeward Bound Claim, and adjacent cut to north).

SITE NETWORKS:

Kiandra – outlying fields on the Kiandra Lead – Snowy Mountains Highway.

COMPARATIVE ANALYSIS:

Kiandra is the largest high-altitude (Alpine) alluvial goldfield in the country. Its open landscape offers views over the town site, diggings and other features that is unparalleled in the Australian Alps, and hence it can present an insight into early living and working conditions in this environment that is available nowhere else. Similar, though smaller alluvial fields exist in the Victorian Alps, but are situated in snow-gum forest, limiting an overall view and understanding of the place & conditions. Other smaller, high-altitude alluvial fields exist in the NSW Alps, but are situated either in forested areas, or are very limited in extent. None have the historical significance of Kiandra.

CULTURAL HERITAGE SIGNIFICANCE:

National/State.

Has national significance cultural landscape value.

Has state historical significance, because of the hopes & government infrastructure invested in the field, and Kiandra’s leading role in a gold-mining revival in NSW, that helped alleviate the economic difficulties the state was experiencing;

Has high scientific value, because of the range of remnant mining features relating to sluicing & hydraulic sluicing for gold;

Has high archaeological potential to reveal information about living and working in an Alpine environment;

May have high historical significance for its role in the development of the NSW ski industry.

PART 3 – CONSERVATION POLICY

(terms as defined in the Burra Charter)

GENERAL POLICY:

Maintenance of the Kiandra landscape is the key to conservation, because the open landscape contains evidence of all facets of the history of the place, from the giddy heights of its boom to its painful struggle into the twentieth century. The general policy will be to care for the cultural features within the landscape, but not actively intervene in the natural revegetation of the place, except in specific instances where historic structures are under threat.

CONSERVATION OBJECTIVES:

- Protect and preserve the historic features of Kiandra, including the archaeology of the place;
- Care for the Kiandra landscape;
- Undertake further study of the place, that may reveal more features of significance, or contribute to a better understanding of the heritage of the place.
CONSERVATION PROCESSES:
(terms as defined in the Burra Charter)

Preservation: Preservation will be the major focus of conservation at Kiandra. Active, materials conservation processes may be applied to historic structures (eg grave furniture, Yans chimney, etc) to promote their survival. Inappropriate management practices that have potential to damage the historic fabric of Kiandra should be proscribed (eg use of heavy machinery in sensitive areas). Destabilising influences (eg vegetation on structures, or burrowing animals) should be addressed.

Reconstruction: Reconstruction (eg of buildings, mining machinery etc) is not recommended. Reconstruction could not feasibly (or actually) reproduce the town of the peak year. Limited reconstruction may create confusion, and detract from the significance of the place as a “roaring” and sprawling gold-rush town of the early 1860’s.

Restoration: Restoration (eg of former buildings, mining machinery etc) is not generally recommended, and in any case it is unlikely that any of the former fabric of the mine machinery and town structures survives elsewhere today, or could be identified even if it did survive. Restoration in response to damage caused by future vandalism, accidental or natural events may be appropriate for built structures (eg Yans chimney, graves, etc). Restoration by removal of accretions (eg uncovering of building or machinery footings etc) may be appropriate where such removal can provide a better understanding of the town or the mining operations.

Adaptation: Kiandra has been adapted for tourism, with the introduction of a town heritage trail, and an historical display. Extension of this use would be compatible with the heritage values of the place, provided that developments relate to the heritage of the place, and are relatively low-key in the landscape.

PART 4 - MANAGEMENT PLAN:

MANAGEMENT OBJECTIVES:
The management objectives for Kiandra are:
- Protect and preserve the heritage features of the township and surrounding diggings;
- Extend the existing interpretive facilities, and maintain them in the longer term;
- Promote understanding and appreciation of the significance of Kiandra & its landscape;
- Provide a safe, educational and enjoyable visitor experience.

MANAGEMENT ISSUES:

Public Risk: Generally low. The major risk environment is associated with the old mine workings, and risks include steep faces and uneven ground. Subsidence in shafts and other workings are risks that should be monitored in the longer term. Open shafts & tunnels were not observed on New Chum Hill, but may exist elsewhere in Kiandra. Mesh capping or safety fencing of deep, open shafts, and mesh barriers on open tunnel entrances would be appropriate responses. Advice on simple, cost-effective meshing can be obtained from Parks Victoria's Bendigo regional office, which has considerable experience in these matters.

Heritage Management: see below.

Landscape Management: The open landscape is basically climate-controlled, and changes over time will not be dramatic as long as current conditions continue to operate. Consequently, management of the landscape will not require a high level of intervention such as that at Grant (Grant Historic Area, Vic), where the township was carved out of heavily-forested hillside. Natural revegetative processes at that place are working to restore the forest, close viewlines and limit appreciation of the former township. At Kiandra, shrubby vegetation that takes advantage of favourable environments created by mining activities (eg linear features such as water races, tracks etc) can assist in delineating these features as they traverse the snow grass-covered hillsides. Similarly, patches of shrubby vegetation growing on old sluicing sites, such as areas on New Chum Hill, draw the eye and indicate that something has occurred there which has altered the natural environment.
Management of the heritage features will form the basis of landscape management at Kiandra. Specific recommendations are:

- Retain the introduced trees in the central township area in the longer term – these are potent visual reminders of the cultural influences at the place. However, their spread should be controlled, and retention must be limited to their present (historical) positions. As trees age and die (or are removed), suitable suckers or seedlings should be groomed as replacements;
- Control taller vegetation at installed viewing points, to maintain viewlines;
- Retain the daffodil display at the graves in the Kiandra cemetery, but control their spread into open, grassland areas;
- Address destabilising influences. This includes removal of vegetation that is destabilising structures (eg rock walls, etc). The graves at the cemetery should be protected from burrowing animals – laying of mesh on the ground is likely to be the most effective form of control, rather than relocation of animals such as wombats;
- Maintain structures. Apply conservative processes as required (eg repointing of rock or brickwork, fish oil application to iron structures such as grave fences, etc). Undertake restoration as required for structures that may be damaged in the future;
- In general, do not intervene in the natural revegetation of old mining sites. This includes grasses & shrubs that are gradually spreading over the slumped faces of the large hydraulic sluicing faces on New Chum Hill;
- Continue weed control of black willow growth on the dam wall beside Pattinson & Winckler’s Claim on New Chum Hill. This is very vigorous growth that has potential to spread and mask features, limiting access and appreciation (cf local native species);
- Do not undertake active revegetation programs in the area, except on earthworks associated with any future infrastructure development;
- Plan new infrastructure to be low-key in the landscape;
- Monitor changes to the landscape in the longer term.

RECOMMENDED DEVELOPMENT:

Kiandra is the most important goldfield in the NSW section of the Alps National Parks, and is the most accessible, being traversed by the Snowy Mountains Highway. Its high significance, outstanding visual features and fascinating history make it the most valuable strategic location for interpretation of the mining history of the NSW Alps. Recommendations as Stage 1 priorities for the presentation of the mining heritage of the Australian Alps are:

**Minor extensions of township heritage trail:**
- Extend the trail to a suitable viewing point on Township Hill, that overlooks the Kiandra cultural landscape. Provide a board that identifies the major elements of the landscape *(refer site description, above)*.
- Construct a short loop or return track from the start of the trail (near the courthouse) that takes visitors to a suitable viewing point overlooking the intensive ground sluicing in the lower part of Pollocks Gully (behind the courthouse). Provide a board that interprets these diggings, as representative of the early diggings and rush at Kiandra.

**Walking track through diggings at New Chum Hill:**
- Provide a basic information shelter at the historic display area on the Cabramurra Road below New Chum Hill, that summarises the history, personalities & and importance of New Chum Hill as part of the Kiandra goldfield;
- Construct a signposted walking track through the diggings on New Chum Hill;
- Erect suitable safety railings at viewing areas that overlook the three major hydraulic sluicing holes;
- Provide interpretive boards at key locations along the track (major & interesting features).

The track should be designed to minimise damage to adjacent historic features. Where existing linear features such as water races may be incorporated into the track, track construction should not obliterate them. A heritage feature plan of New Chum Hill and an optional approximate track route are presented as Appendices attached to this Heritage Action Plan. This track uses existing tracks where possible, to minimise the need for new track cutting.
APPENDIX TO HERITAGE ACTION PLAN – SITE PLANS

SITE PLAN
NEW CHUM HILL, KIANDRA
KOSCIUSKO NATIONAL PARK

Based on field work undertaken by R Kaufman & L Thompson, Oct 2001
OPTIONAL ROUTE
FOR PROPOSED
WALKING TRACK

NEW CHUM HILL
KIANDRA

View over Kiandra

Start/finish

Footbridge required

= Viewpoints

= Walking track
APPENDIX TO HERITAGE ACTION PLAN

PHOTOGRAPHY

View from Township Hill – note introduced trees along road (centre-right).

Ground-sluicing works behind courthouse.

Homeward Bound sluicing claim, New Chum Hill

Lonely graves in the Kiandra cemetery

Basalt boulders from sluicing operations at Pattinson & Winckler’s Claim, New Chum Hill

*Photos taken October 2001, R Kaufman.*
PART 1 - DESCRIPTION

NAME:
Monarch Mine (also known as Amalgamated Gold Mine, from 1915 to mid-1920’s).

MANAGEMENT UNIT:
Bogong Unit, Alpine National Park, Vic.

LOCATION:
General location: In the watershed of the East Branch of the Ovens River, in a gully immediately below the Great Alpine Road, approximately 6.5km south of Harrietville in a direct line.

AMG Coordinates: 505200E 5910200N (battery, approx).

SITE DESCRIPTION:
(refer also Site Plans, attached)

The earliest part of the site is located outside the National Park, on Crown Land on the western side of the main ridge above the gully containing the adit levels. It is situated beside the overgrown old Harrietville road, and consists of a substantial open underlay shaft, a vertical air shaft, trenching, a machinery platform, and some mullock. A sleigh track down to the Crescent battery is visible.

The No 1 Adit Level is within the National Park. It is situated in a gully immediately below the Great Alpine Road, and the entrance, while clearly visible, is filled with spoil from the roadworks. There is a substantial mullock dump, and a number of benched hut sites. A level tramway follows the contour of the hill to the top of the former flying fox, used to transport stone to the battery (position of headworks not located).

The No 2 Adit Level is in the gully below, and the adit entrance, filled with gravel washed down from higher up, is just discernible. A tramway connects the adit to a large mullock dump, and a side line follows the contour to a position above the battery. This line passes the blacksmith’s shop, where a stone hearth, some of the concrete floor, and abundant artefacts (including an ore-truck bodies, a badly decayed set of bellows, gads, handsteels, carbide & fuel drums, etc) are visible. The battery site is a large benched platform, containing the standing frame of a 10-h battery (5-h complete, with wooden plate tables), a portable steam engine, countershaft, oil-engine bed, square iron tank, etc. Corrugated iron is visible covering the ground (remnants of the battery shed burnt down in 1939). A holding dam is situated in the right-hand gully above the battery. A short distance down the gully is an ore truck.

A former cyanide plant situated lower in the gully has not been investigated or described. Thick blackberry growth may hide other features at any of the different sections of place.

CONDITION:
The site is heavily overgrown with blackberries. Condition of machinery relics is generally fair-good.

THREATS:
The principal threats are pilfering of artefacts and wildfire.
PART 2 – CONSERVATION ANALYSIS

SITE HISTORY:

The Monarch reef was discovered by accident in 1896, during unloading of machinery on the old Harrietville road, bound for the Crescent Mine. The mine was purchased from the discoverers, Smith & McKenzie, by the New Options Co, after a trial crushing yielded 7 ounces/ton. An underlay shaft was started in that year, and early crushings were very rich. A 32-ton parcel yielded 480 ounces of gold, and the first 200 tons yielded nearly 2000 ounces. The No 1 Adit, on the other side of the ridge, was begun in 1897, and the workers’ huts were situated here from that time. In 1904, the Monarch was purchased by Messrs Buckley, Hunter & Hunter.

In 1913, the No 2 Adit was started, and a steam-driven, 10-head battery erected adjacent to the adit. This battery had been purchased new for the New Options Co in 1896, and had previously been situated at the Crescent Mine. It was the machinery that was being unloaded when the Monarch reef was found, and it also undertook the early crushings from the Monarch at its earlier location. In 1915, the Monarch was taken over by a syndicate headed by C Proctor, and prospecting works were undertaken. Proctor took over the operation when the syndicate folded, and in 1927 more payable gold was found. Only 5-h of the battery was used, and power was supplied by an oil engine.

The last recorded crushing was in 1935, and the plant burnt down in the 1939 bushfires. The mining lease was kept current, and the last 15-year lease was granted in 1957, but relinquished in 1965. Total recorded production was 7041 ounces of gold from 12,017 tons of ore.

References:
“The Harrietville Goldfield”, W Bradford, 1903 (Bulletin 11, GSV);
“The Monarch Mine, Harrietville”, J Kenny, 1924 (Records of the GSV, Vol 5 Pt V, pp210-212, 1936);
Mining & Geological Journal, Vol 1 No 2, July 1938;
Sundry lease documents, oral histories & “Alpine Observer” articles held by LRGM-Services, Bright.

CHANGES TO THE FABRIC:

The mining operation moved over time from the reef outcrop, over into a gully on the other side of the ridge. Occupation sites were at No 1 Adit from 1897, for the working life of the mine. Materials from the mine huts & buildings (other than the battery shed?) have been removed from the site, as has the oil engine used to power the battery in later years. The site is remarkable for the range of extant small artefacts, and their survival (and those of the larger relics) is probably due to the lease being held for a considerable period (to 1965) after work had ceased.

SITE NETWORKS:

Monarch Mine – old Harrietville Road – Harrietville – Crescent Mine (battery site).

COMPARATIVE ANALYSIS:

This is one of several reef mining sites that were added to the Victorian Heritage Register on the basis of their large inventory of relics, and the information they contained on the history of mining in the State. The Monarch stands out for its range of unsalvaged artefacts, preserved by an on-going leasehold until the site was virtually forgotten, at a time when gold mining was in the doldrums.

CULTURAL HERITAGE SIGNIFICANCE:

State.
Has local historical significance as one of the largest & most successful mines of the 1890’s revival;
Has State scientific significance, because of the range of well-preserved machinery relics, blacksmith’s shop site, abundance of small mining artefacts, etc. These combine with mining features and occupation sites to make the Monarch an excellent representative example of this form of mining;
Has high archaeological potential to reveal information about the history of mining in the State; Significance enhanced by the accessibility and visual qualities of site, making it valuable for interpretation.

PART 3 – CONSERVATION POLICY

GENERAL POLICY:

The cultural heritage significance is principally scientific, and policy should focus on those features that provide this significance. Because the place has such high significance, protection and preservation of the visible machinery & equipment, and the archaeological potential of the place, is paramount.

The Monarch is situated in tall, regrowing Woollybutt (*Eucalyptus delegatensis*) forest, and stands of mature tree ferns (*Dicksonia antarctica*) exist around the site. It commands views across the valley of the East Branch of the Ovens River to the Razorback, snow-covered in winter. The combination of the natural & cultural environment produces excellent visual qualities that add value to the significance by strongly communicating the sense of abandonment of the place and a way of life long gone, as well context for the living & working conditions. Therefore enhancement of the natural environment through a blackberry control program within the site would be a desirable conservation action.

CONSERVATION OBJECTIVES:

The conservation objectives for the Monarch Mine are:

- To protect and preserve the physical fabric of the place;
- To enhance the visual qualities of the place.

CONSERVATION PROCESSES:

(*terms as defined in the Burra Charter*)

**Preservation:** Preservation will be the main focus of conservation at the Monarch Mine, and will consist primarily of simple actions that will help prolong the survival of the fabric, rather than the application of preservative processes (materials conservation). For instance, survival of iron items may be prolonged by removing built-up earth or leaf litter that is in contact with iron surfaces, and promoting rust. Specific vegetation removal may be appropriate where it imminently threatens to damage or destabilise machinery or structures.

**Restoration:** Restoration is not generally recommended, except for removal of accretions (eg slumped hill soils, tin sheets etc), where the removal may increase understanding of the place. Return of missing pieces of original machinery & equipment may be appropriate, if their provenance can be conclusively proven, and their return will not expose them to unsustainable damage, theft, etc. Any restoration must be carried out in a manner that does not damage the existing fabric of the place.

**Reconstruction:** Reconstruction (eg reconstruction of buildings, or installation of replacement machinery for missing items) is not generally recommended. An exception (as part of presentation) may be at the blacksmith’s shop, where reconstruction of the building as a safe storage place for vulnerable small artefacts is an option, provided that the appropriate level of security can feasibly be integrated into the structure. The battery bed logs may require attention in the future, to maintain the battery as a standing unit.

**Adaptation:** Presentation of the site with the provision of visitor access & low-level interpretations would be compatible with the heritage values of the place.

PART 4 - MANAGEMENT PLAN:

MANAGEMENT OBJECTIVES:

The following are the management objectives for the Monarch Mine site:

- Protect and preserve the historic fabric of the site;
• Develop and maintain visitor access facilities and historical interpretations at the site;
• Communicate the cultural heritage significance of the place;
• Provide a safe, educational & enjoyable visitor experience.

MANAGEMENT ISSUES:

Management duality: Part of the Monarch Mine (underlay shaft & associated features) is on Crown Land adjacent to the National Park, and is under the management of the Department of Natural Resources & Environment (DNRE). While presentation of this part of the site is not recommended below, the features nonetheless merit preservation as part of a highly significant cultural heritage place in Victoria. To this end, the local DNRE office should be informed of any developments within the National Park, and their role in caring for the overall site. This could be facilitated by the involvement of the Historic Places Section, DNRE. The underlay shaft site is robust, and does not require conservation action. It should simply be protected from inappropriate management actions that may cause damage to the historic fabric (eg bulldozing of site to fill open shaft, as a future risk-mitigation response).

Public Risk: Low. Risk is not a major element at the site. Both adits are closed, and no open workings exist in the vicinity of the battery. Risk environments are steep slopes, steep batters (eg on mullock dumps), uneven ground etc, and under the present circumstances do not require intervention. In association with presentation of the site, risk minimisation strategies will be centred on avoidance, with provision of defined pathways & viewing areas.

Heritage Management: Heritage management at the Monarch will be essentially protection of fragile or vulnerable artefacts. At present the site is not managed, and there is evidence that pilfering of artefacts has taken place in recent times. Presentation of the site, as recommended below, will put the site under active management, and within the developments and on-going maintenance, a suitable level of protection should be instituted. The site has legislative protection under Part 4 of the Heritage Act 1995, and a permit process applies to non-exempted alterations to the place.

Some elements of the place are vulnerable to fire, and the site should receive special protection from any proscribed burns that may be undertaken by management for any reason (including back-burning) in the future. Vegetation management (other than for weed control) is not necessary, except for specific interventions where features (eg machinery, rock walls etc) may be under imminent threat of destabilisation or damage. Any tree removals must be done in a manner that does not cause damage to the surrounding historic fabric, and any stumps should be poisoned, not grubbed. Use of heavy machinery for any purposes within the site is prohibited, and tracks within the site should be hand-cut, or use existing tracks (eg tramlines).

RECOMMENDED DEVELOPMENT:

The Monarch Mine battery site has high potential for presentation, because of its accessible location beside the Great Alpine Road, its high cultural heritage significance, and its visual qualities. Presentation is recommended, as a Stage 1 priority within the Australian Alps National Parks. Basic recommendations are that:
• The site be further investigated, and a strategy be developed for the protection of vulnerable artefacts at the site, prior to presentation;
• A suitable parking area be established on the Great Alpine Road;
• Foot-track access to the battery site, of a suitable grade, be constructed to access the battery site.

The level tramway is suitable as a track through the site, and should be considered. Entry into the actual battery site has constraints, including damage to the fabric, and the need to undertake appropriate ground preparation works that may themselves be damaging. An option worthy of consideration is the provision of an elevated pathway and viewing area, that provides a birds-eye view of the plant. Basic on-site interpretations should be provided on boards, and an information board of standard design at the parking area is an option.
APPENDIX TO HERITAGE ACTION PLAN

SITE PLANS
APPENDIX TO HERITAGE ACTION PLAN

SITE PHOTOGRAPHY
(Photos A Swift, 1995)

Portable steam engine

Stamp battery

Wheels off portable steam engine
PART 1 - DESCRIPTION

NAME:

South Bloomfield hydraulic sluicing hole & Elaine Mine (sluice hole referred to as South Broomfield in 1886 report).

MANAGEMENT UNIT:

Kiandra Historic Area, Kosciusko National Park, NSW.

LOCATION:

General Location: Approx 1 km east of Tabletop Mountain Track, on Bloomfield Creek (a tributary of 4-Mile Creek).

AMG Co-ordinates: 634320E, 6021190N (adit entrance of Elaine Mine).

SITE DESCRIPTION:

(refer Site Plans, attached)

South Bloomfield: This site consists of a large hydraulic sluicing excavation; a deeply-incised tail race at the lower end; a wide, shallow earth dam; a water race; a rock-walled holding dam at the end of the water race; sundry minor head races, pebble-heaps, trenches & excavations, etc. The South Bloomfield is connected to the Elaine Mine by a short, side-cut track.

Elaine Mine: This is a well-preserved site on Bloomfield Creek, and contains an abundance of relics of the former operation of this underground deep-lead mine. The relic machinery & equipment includes a portable steam engine (on access track), air receiver (previously described as small boiler), ore trucks, gold riffles, two double-acting piston pumps (previously described as gas engines), a slider from a drifter (rock drill), and sundry scrap metal & small items. There are several neat stacks of split lathes, presumably ready for use in paneling excavations of the deep lead. At the south end of the site are the remains of huts, and elsewhere there are benched areas indicating small sheds or huts, and a stone hearth (for blacksmithing) near the adit entrance. A large, orange-coloured mullock dump extends out from the open adit, and is remarkable for its lack of revegetation.

CONDITION:

The workings and other features at the South Bloomfield are in fair-good condition. At the Elaine, the relic machinery and other artefacts are in good condition. The huts have collapsed, and little is left of their structure. The timber lathe stacks are in fair condition, considering their age. The steam engine still retains its brass fittings and glass.

THREATS:

The workings and other features at the South Bloomfield are robust, and not threatened. The surviving relics and other features at the Elaine Mine are less robust. The timber lathe stacks and hut remnants are at risk from wildfire. Small artefacts and attachments may be at risk from pilfering.
PART 2 – CONSERVATION ANALYSIS

SITE HISTORY:

The history of the South Bloomfield sluice hole is not well known. It seems that sluicing had been finished by 1886, and that it did not yield a great amount of gold. However, it has been pointed out that the bottom of the lead (an extension of the Kiandra lead) had not been reached in these operations, and the better values may never have been accessed.

The Elaine Mining Co Ltd was formed in 1926 by Messrs Hughes, Bennett & Foy (replacing a syndicate), to tunnel into the lead at a lower level and mine portions of the gold-bearing lead that were not available to the earlier sluicing operation. Tunnelling through the bedrock appears to have begun in 1926, and a steam-driven air compressor was used to provide air for the jackhammer (light rock drill). By 1930, the tunnel was in 465 feet, and with regular aid granted by the Department of Mines, it was pushed ahead in stages, reaching 700 feet in 1933. The tunnel continued to be extended, and a rise (vertical opening to test the lead overhead) was 60 feet high early in 1934, but did not hit any wash.

By 1937, the tunnel was 950 feet long, and a 45-feet deep shaft had been sunk vertically above the rise. A petrol-driven compressor had replaced the earlier steam-driven unit. Late in 1937, aid was granted for the first of three boreholes designed to locate the position of the lead. No 1 bore hit a small amount of wash, but the other two did not. Aid for further boreholes was granted in April 1939, but no records of further work were found.

It seems that the lead was never located at the Elaine Mine, and it is probable that the machinery & equipment was left on-site with the intention of resuming prospecting works at some time in the future. The company spent £11,000 on works at the mine, while the Department of Mines contributed approximately £1300.

References:
“A Report on the Mining History & Remains in the Northern Half of the Kosciusko National Park”, M Pearson, 1979 (NPWS);
Annual Report, NSW Dept Mines, 1886, p166;

CHANGES TO THE FABRIC:

Both sites are relatively undisturbed since mining ceased. At the Elaine, the only major pieces of machinery or equipment that have been removed are the air compressor and the later petrol engine.

SITE NETWORKS:

Elaine Mine – South Bloomfield – Tabletop Mountain Trail (former mining track) – Kiandra.

COMPARATIVE ANALYSIS:

Tunnelling to extend workings after hydraulic sluicing was relatively common. However, the Elaine Mine retains more of the fabric of its operation than any such mine (deep lead tunnel) in Victoria or New South Wales, and the combination of excellent examples of the two types of deep lead mining, existing side-by-side and in relative isolation from other gold workings, is rare.

CULTURAL HERITAGE SIGNIFICANCE:

State.

Has scientific significance, showing clearly the relationship between two types of deep lead gold mining. The abundance of relics at the Elaine can provide detailed information about this type of mining; Has archaeological potential to reveal more about deep lead mining under Alpine conditions.
PART 3 – CONSERVATION POLICY

GENERAL POLICY:

These sites display the surface workings of a deep lead gold mine, and a fascinating window into the world of underground deep lead mining & the living conditions of the miners. Retention of the visual aspects of the sites is paramount, as is retention of the abundant artefacts at the Elaine Mine site. The general scatter of machinery, equipment & hut ruins at the latter promotes a sense of discovery of a place long abandoned and suffering the ravages of time. This ambience would be removed by attempts at restoration or reconstruction. The significance lies in the existence of the artefacts, not their distribution, and restoration or reconstruction would do nothing to further reveal the significance.

For the South Bloomfield, the general policy will be to allow natural processes to operate at the site, and avoid inappropriate management actions that would impact adversely on the heritage values.

At the Elaine Mine, intervention should be made only where the historic fabric is under threat. Action will be specific (eg permanent fixing of steam engine fittings, cutting of firebreaks [rakehoe trails] in burning operations, removal of a piece of vegetation where structures or machinery are threatened, etc). Otherwise, natural processes should be allowed to operate.

CONSERVATION OBJECTIVES:

The conservation objectives for the Elaine Mine & South Bloomfield are:

- To protect & preserve the physical fabric of the sites;
- To retain the present visual aspects of the Elaine Mine & South Bloomfield sluice hole;
- To maintain the visible fabric & archaeological potential of the Elaine Mine

CONSERVATION PROCESSES:

(terms as defined in the Burra Charter)

Preservation: Preservation will be the main focus of conservation, and at the Elaine Mine will consist of intervention where threats are defined, rather than the application of preservative processes. That is, the materials of the historic fabric (iron, cast iron, timber etc) will be allowed to decay, but will be afforded protection from physical threats such as fire, falling trees, theft etc.

Restoration: Not recommended.

Adaptation: Installation of low-level historical interpretations & visitor access facilities would be compatible with the maintenance of the heritage values of the sites.

PART 4 - MANAGEMENT PLAN:

MANAGEMENT OBJECTIVES:

The management objectives for the Elaine Mine & South Bloomfield are:

- To manage the site in accordance with the Conservation Policy outlined, to maintain the cultural heritage significance of the sites;
- To avoid inappropriate management actions that would adversely impact on the cultural heritage significance of the sites;
- In the longer term, to develop the sites for visitor access, and provide a safe, educational and enjoyable visitor experience.
MANAGEMENT ISSUES:

Public Risk: The risk environments at these sites relate principally to the remnant mining features. The major risk factors at the South Bloomfield are the steep cliff faces at the upper end of the cut. At the Elaine Mine, the open tunnel and possible shafts uphill (not inspected) present risk. These risks are considered low (not requiring management action) under the present situation, as remote and comparatively little-visited places. The following risk minimisation works are suggested in association with any formal presentation of the sites as part of a heritage trail:

- Close the Elaine tunnel mouth with a mesh barrier (the inside of the tunnel should be checked by a suitably experienced person prior to closure, for the existence of portable artefacts [machinery, equipment etc] that may be deteriorating, and can easily & safely be rescued);
- Keep the path to South Bloomfield sluice hole from water race away from the edge of excavation. Viewing can be provided via a short entry track to an appropriate viewpoint, equipped with a post-&-railing barrier;
- Undertake risk assessment on shafts associated with the Elaine tunnel. Install mesh caps or safety fencing as required.

Heritage Protection: The threat of pilfering of artefacts from the Elaine Mine was examined by Pearson (1979), and salvage of artefacts at risk for possible display elsewhere was canvassed. The mine has been regularly visited over the 22 years since the Pearson report, and there is no evidence of pilfering from the site in this period. The only valuable objects of general interest or use that are sufficiently portable are the brass fittings on the steam engine. A simple solution would be to braze or otherwise permanently fix these fittings to the engine. The pumps, ore trucks, receiver and other larger items are not considered to be at risk of theft because of their weight & bulk, and most of the smaller scrap and objects are of little practical use. The Elaine site should be monitored in the longer term for pilfering of artefacts, and action taken as required.

There is little that can be done to effectively protect the Elaine Mine site from wildfire. However, the site should receive special protection from any proscribed burns that may be undertaken by management for any reason (including back-burning) in the future.

Vegetation at present is not a major threat to the heritage values at the Elaine Mine. However, the site should be monitored for any growth that threatens to destabilise or damage any of the important relics or features. Response should be limited to specific action such as pruning or minor vegetation removal. Any stumps left should be poisoned and left in-situ, not grubbed.

RECOMMENDED DEVELOPMENT:

Presentation of the Elaine Mine & South Bloomfield workings is considered desirable, because of their cultural heritage significance, and interesting visual features. However, their relative isolation means that their presentation would be best effected as part of a longer “heritage trail” in the Kiandra Historic Area. This would ensure that visitors to the sites could experience other aspects of the rich mining heritage of the area along the way, including the Empress Mine & 9-Mile Diggings, 4-Mile diggings & hut, North Bloomfield (optional), etc. The track would communicate to visitors that there is considerably more to the Kiandra goldfield than the diggings at Kiandra, and, remote from the Snowy Mountains Highway, would provide a better appreciation of the conditions under which mining took place.

Construction of such a track is recommended, but not considered to be a Stage 1 priority. In terms of future presentation of the mining cultural heritage of the Kiandra Historic Area, it would be the next logical development after Stage 1 recommendations at Kiandra. Recommendations are:

- Provide sign-posted walking access to the two sites, as part of a loop from the Tabletop Mountain Track, that includes the Empress & 9-Mile diggings, and the 4-Mile diggings & Hut;
- Provide entry to sites via a new track, from a suitable point on the Tabletop Mountain Trail. This track should connect to the South Bloomfield water race, and provide viewing of the rock-walled dam before heading downhill to the open cut;
- Undertake risk works;
- Link the two sites by rehabilitating the existing track link (include viewing of the portable steam engine);
• Examine options for providing a foot-track link down Bloomfield Creek to 4-Mile Creek & hut;
• Provide an information board (or suitable interpretations board) at the Elaine Mine;
• Develop a track brochure that contains summary information on all of the presented sites, including the Elaine Mine & South Bloomfield open cut.

Compiled by LRGM - Services
12 December 2001
as part of the
Australian Alps Mining Heritage Conservation & Presentation Strategy
APPENDIX TO HERITAGE ACTION PLAN

SITE PLANS

SITE PLAN

ELAINE MINE & SOUTH BLOOMFIELD WORKINGS

Based on site inspection, Rob Kaufman, Oct 2001

SITE PLAN

ELAINE MINE

Sketch plan only: not to scale

Based on site inspection, Rob Kaufman, Oct 2001
APPENDIX TO HERITAGE ACTION PLAN

SITE PHOTOGRAPHY

South Bloomfield sluice hole

Portion of rock wall on dam, South Bloomfield

Steam engine on track above Elaine Mine

View over Elaine Mine site from mullock dump

*Photos taken October 2001, R Kaufman.*
PART 1 - DESCRIPTION

NAME:
Yorkies Diggings.

MANAGEMENT UNIT:
Northern Region, Kosciusko National Park.

LOCATION:

General Location: On Yorkies & Taylors Creeks, beside Long Plain Road, approximately 4km north of Rules Point.

AMG Co-ordinates: 640000E, 6048900N (Yorkies Creek).

SITE DESCRIPTION:
On each creek, only the diggings adjacent to Long Plain Road were inspected. These are on grassy plain on Yorkies & Taylors Creeks, east-flowing tributaries of the Murrumbidgee River. The workings consist of ground sluicing with associated shingle heaps, shallow shafts (mostly slumped), trenching, and small head & tail races. The total area affected does not appear to be more than a couple of hectares.

CONDITION:
The diggings are in fair condition, and do not appear to have suffered later disturbance.

THREATS:
There are no major threats to the surviving fabric of the diggings.

PART 2 – CONSERVATION ANALYSIS

SITE HISTORY:
These diggings were worked into the 1940’s, and had a small settlement (Yorkies) associated with them.

Reference: Information & photograph presented on NPWS information board at Rules Point, at start of Long Plain Road (source unknown).

CHANGES TO THE FABRIC:
The diggings are intact and appear to have suffered no later disturbance. No buildings or substantial ruins appear to remain.

SITE NETWORKS:
Yorkies Diggings – Rules Point – (possible water races & dams on hillsides above) – (Long Flat Hut?)
COMPARATIVE ANALYSIS:

Small patches of alluvial diggings are common in the northern half of the Kosciusko National Park. There are no special features or historical aspects that would elevate the significance of Yorkies diggings, and the common features that they do show are well-represented elsewhere (eg Kiandra).

CULTURAL HERITAGE SIGNIFICANCE:

Local.
Some archaeological potential may exist within Yorkies settlement site (not located during brief inspection).

PART 3 – CONSERVATION POLICY

GENERAL POLICY:

The diggings do not show any significant features that would require active management to maintain. The historical value of Yorkies diggings was as an incremental contributor to mining in the Australian Alps, and its heritage value lies in the simple visual evidence it shows of former operations. Therefore the general policy will be to allow the natural processes of decay to operate at the site, and to avoid inappropriate management action that would remove evidence of the former workings.

CONSERVATION OBJECTIVES:

To retain the visible evidence of gold mining on Yorkies & Taylors Creek.

CONSERVATION PROCESSES:

(terms as defined in the Burra Charter)

Preservation: Avoid inappropriate management actions that would remove evidence of the former workings, or of the Yorkies settlement site.

Reconstruction: Not recommended.

Restoration: Not recommended.

Adaptation: Not applicable.

PART 4 - MANAGEMENT PLAN:

MANAGEMENT OBJECTIVES:

To retain the diggings as evidence of past cultural activity within the Kosciusko National Park.

MANAGEMENT ISSUES:

Public Risk: The cursory field inspection did not reveal any major risk that would require management action. Some very shallow open shafts are visible. The diggings are of low visibility in the landscape, and unlikely to attract attention. Any deep open shafts that may be found in close proximity to Long Plain Road can be filled. This should be done in a manner that minimises damage to adjacent surface mining features. If feasible, it should be done using introduced fill, so that the shaft collar (ring of mullock) is visible and the shaft position can be readily monitored for future subsidence.

Heritage Protection: No action required.
RECOMMENDED DEVELOPMENT:

No developments recommended. When resources are available, the diggings can be recorded for future reference (particularly in regard to any visible archaeological evidence of the former settlement), at the interest of the managers.

Compiled by LRGM - Services
10 December 2001
as part of the
Australian Alps Mining Heritage Conservation & Presentation Strategy
APPENDIX 2 (cont’d)

SUNDRY SITE PLANS

The following site plans were generated during the project, and are presented here as additional resources.

1: THREDBO DIGGINGS, Kosciusko NP, NSW

**General Site Plan, Thredbo Diggings**

*Plans based on site inspection, Oct 2001.*
2. STAMP BATTERY ON GOLDSEEKERS TRACK, 3-MILE DAM, KIANDRA:

![Diagram of Stamp Battery Site]

**PLAN 1**
**BATTERY SITE**

**PLAN 2**
**GENERAL PLAN OF BATTERY SITE, AND ASSOCIATED DIGGINGS & OCCUPATION SITES**

*Based on field work undertaken by R Kaufman & L Thompson, Oct 2001*
3. LOBBS HOLE COPPER MINE, KOSCIUSKO NP:

Based on field work conducted Oct 2001 by R Kaufman & L Thompson

GENERAL SITE PLAN
LOBBS HOLE

SKETCH PLAN
No 1 SHAFT
(Representational rather than accurate)

SKETCH PLAN
SMELTER SITE
(Representational rather than accurate)
4. BRANDY CREEK MINE, BOGONG UNIT, ALPINE NP:

SKETCH PLAN
BRANDY CREEK MINE (WHITE’S WORKINGS)
Not to scale – features approximate

GENERAL PLAN
BRANDY CREEK WORKINGS

Features based on brief site inspection by R Kaufman, L Thompson & A Swift, Nov 2001
5. MAUDE & YELLOW GIRL MINE, MT WILLS HISTORIC AREA, VIC

SKETCH PLANS OF
No 5 ADIT,
1931 PLANT,
1941 PLANT
MAUDE & YELLOW GIRL MINE

Not to scale – features approximate

Sketch plans based on brief site inspection by R Kaufman, Dec 2001
APPENDIX 3

FLOW CHARTS
The following flow charts can be used as templates to assist the decision-making process at mining sites/areas in forested areas within the Alps National Parks, and adjacent Historic Areas. They help to define the level of management intervention that may be required, in either the protection or presentation of the sites.

In general, mining sites in the Alps will be managed as ruins, and intervention will principally occur in the following limited circumstances:

- Where a site is being presented, and works are necessary to attend to site protection, public risk and interpretation;
- Where a site is often-visited, and risk & protection works are required;
- Where high cultural significance is attached to non-durable fabric, sufficient to require conservation works (rare).

Quartz mining has been split into two charts (durable & non-durable fabric), only because of the difficulty of presenting all the information on a single A4 sheet.
FLOW CHART No 1A:
DECISION-MAKING AT QUARTZ MINING HISTORIC SITES & PRIMARY BASE METAL MINES (FORESTED AREAS)

Durable Fabric:

QUARTZ MINING SITES
(& primary base metal mines)

Tracks, races, dams, hut sites, tramways etc

Generally leave as is. Avoid damaging management actions; minor vegetation removal for enhancement only where appropriate

Risk assessments may be undertaken

Little action usually required

Open tunnels
Open shafts
Open stopes

Rarely visited/remote sites

Risk assessments

Visited/presented sites

Risk assessments

High risk

High significance (State, Regional)

Actions may involve mesh capping, provision of doors, safety fencing, warning signs etc. Backfilling not recommended

Low significance (Local)

Assess network & visual site value (Do these workings hold valuable information about a significant site?)

High

Low

Treat as for High significance

Action may involve backfilling, etc

Mullock dumps
Collapsed shafts

Generally leave as is
FLOW CHART No 1B: DECISION-MAKING AT QUARTZ MINING HISTORIC SITES & PRIMARY BASE METAL MINES (FORESTED AREAS)

Non-durable fabric:

QUARTZ MINING SITES (& Primary base metal mines)

- Determine cultural heritage significance

High (State/Regional)

- Assess condition (examine fabric for stability, integrity, decay, etc)
- Record site, Monitor decay
- Security (risk of pilfering, removal, vandalism etc)
- Destabilising influences (tree growth & roots, poor drainage, rust, etc)

Good

- Conservation* (stabilisation) action may be required (eg materials conservation, rarely restoration/reconstruction)
- Action: eg close road access;
- High risk (vulnerable to pilfering, vandalism etc)

Poor

- Action: eg tree removal & stump poisoning, drainage works etc
- Low risk (secure site, or site with few portable/fragile artefacts)
- Action will depend on significance of site

Low (Local)

- Huts to be treated as a part of the overall fabric of site.
- Action will depend on significance of site

Huts

- No action other than detailed recording of site

* Refer Conservation Processes in main body of report
FLOW CHART No 2: DECISION-MAKING AT ALLUVIAL MINING HISTORIC SITES (FORESTED AREAS)

ALLUVIAL MINING SITES
Forested Areas

Tracks, races, dams, hut sites (usually low public risk, except water-filled dams - rare)

Generally leave as is. Avoid adverse management actions. Optional minor vegetation removal for enhancement

Sites with risk environments:
- Open shafts;
- High sluiced banks (hydraulic sluicing)

Often visited/presented sites

Assessed high risk

High significance (State/Regional)

Risk works: eg safety fencing, mesh capping, avoidance strategies

Assessed low risk

Low significance (Local)

Generally leave as is

Assess network values

Generally leave as is

High value (associations)

Treat as for high significance; do not bulldoze/backfill to address risk

Low value (no associations)

Avoidance strategies preferred (eg re-routing adjacent tracks); Broad fencing an option

Rarely visited/remote sites

Generally leave as is: no action required

Relics/machinery (piping, scrap metal, tools)

Large risk environments:
- Shallow sinking, collapsed shafts, ground sluicing.

Rarely in evidence at alluvial mining sites

Conservation action may be required

Conservation action may be required from heritage viewpoint

Huts (not always situated within associated diggings)

Considered as part of network, including associated diggings

Adapted hut use may require maintenance

Rebuilt or reconstructed post-mining

No action required from heritage viewpoint

Apply conservation actions as required, for maintenance

Low-risk environments:
- Shallow sinking, collapsed shafts, ground sluicing.

Generally leave as is:

Assessed high risk

High significance (State/Regional)

Risk works: eg safety fencing, mesh capping, avoidance strategies

Assessed low risk

Low significance (Local)

Generally leave as is

Assess network values

Generally leave as is

High value (associations)

Treat as for high significance; do not bulldoze/backfill to address risk

Low value (no associations)

Avoidance strategies preferred (eg re-routing adjacent tracks); Broad fencing an option

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Apply conservation actions as required, for maintenance

Low-risk environments:
- Shallow sinking, collapsed shafts, ground sluicing.

Generally leave as is:

Assessed high risk

High significance (State/Regional)

Risk works: eg safety fencing, mesh capping, avoidance strategies

Assessed low risk

Low significance (Local)

Generally leave as is

Assess network values

Generally leave as is

High value (associations)

Treat as for high significance; do not bulldoze/backfill to address risk

Low value (no associations)

Avoidance strategies preferred (eg re-routing adjacent tracks); Broad fencing an option

Rarely visited/remote sites

Generally leave as is: no action required

Relics/machinery (piping, scrap metal, tools)

Large risk environments:
- Shallow sinking, collapsed shafts, ground sluicing.

Rarely in evidence at alluvial mining sites

Conservation action may be required

Conservation action may be required from heritage viewpoint

Huts (not always situated within associated diggings)

Considered as part of network, including associated diggings

Adapted hut use may require maintenance

Rebuilt or reconstructed post-mining

No action required from heritage viewpoint

Apply conservation actions as required, for maintenance

Low-risk environments:
- Shallow sinking, collapsed shafts, ground sluicing.
APPENDIX 4

DEFINITIONS OF TERMS

A. MINING p 147
B. MINING HERITAGE 147
C. MINING LANDSCAPES 148
D. HERITAGE DEFINITIONS 148
E. HISTORICAL UNITS 149
APPENDIX 4: DEFINITIONS OF TERMS

A. MINING

Mining has been defined essentially on a commodities basis - that is, mining for metals and fossil fuels. The latter does not have an expression within the study area, other than an ambit diamond drill bore for gas/petroleum at Lobb's Hole in 1918. While minor coal lenses were found intercalated within certain deep leads in the area, there has been no mining undertaken, and consequently coal-mining has not been included in any context histories appended. The definition of mining includes prospecting and mineral exploration activities.

Mining as defined does not include extractive industries, such as quarrying for dimension stone, crushed rock etc. Extractive industry is not included with mining in industry or legislative definitions, and in project terms would not be definable in any meaningful sense. Historic themes more appropriate to extractive industry are related to construction, including the construction of roads, houses, dams etc.

Indigenous mining:

Excavation of stone for implement making, and ochre for decoration, has long been carried out by Aborigines in Australia. In the eastern states (Queensland, New South Wales & Victoria), 416 mining sites have been recorded. In New South Wales, 183 sites have been identified, consisting of 144 stone pits, 17 ochre pits, and 22 with no information available. Two quarries have been identified in the NPWS databases for Kosciusko National Park.

The narrow definition of mining applied to this project does not include indigenous mining. Examination and assessment of any of these sites that may exist within the Australian Alps would require a different set of expertise and experience, to provide the necessary cultural context for the works.

B. MINING HERITAGE

Mining heritage extends beyond the actual mining sites themselves. Mining sites are simply the workplaces where mineral wealth was generated. However, they are not the places where the wealth was spent, where mining support industries and activities were undertaken, where access tracks were made, or even usually where miners lived, played or raised families.

A working definition of mining heritage, in a physical sense, would be:

Mining heritage consists of those cultural heritage features that owe their existence to historic mining activities. It includes mining sites & diggings, mining towns, mining tracks & roads, and particular local industries that developed specifically to service mining or miners. It may also include strong physical expressions of the wealth or poverty, and political or social effects generated by mining. Mining heritage may be expressed in sites or landscapes.

21 MinFact No 84, ”Mining by Aborigines - Australia's First Miners”, January 2000, NSW Department of Mineral Resources.
22 Quoted in ”International Cultural Significance of the Australian Alps”, Jane Lennon & Associates, 1999 (AALC).
C. MINING LANDSCAPES

The following working definition of a cultural landscape in the Australian Alps is given in Jane Lennon & Steve Matthews' "Australian Alps Cultural Landscape Management Guidelines", 1996 (AALC):

A cultural landscape is a physical area with natural features and elements modified by human activity resulting in patterns of evidence layered in the landscape, which give the place a particular character, reflecting human relationships with and attachment to that landscape.

The project definition is the above, with the modifier being historic mining activity.

D. HERITAGE DEFINITIONS

Place Types

In their Victorian regional assessments, the Australian Heritage Commission supplied various terms for classifying different types of places with historic value. These were:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>The physical remains of a deliberately constructed feature associated with human activity such as a building, hut, dam, water race or stockyard;</td>
</tr>
<tr>
<td>Complex</td>
<td>A number of features that are related to each other in some way, eg through use or function, such as the various structures associated with a farming homestead;</td>
</tr>
<tr>
<td>Site</td>
<td>The location of an event, structure or complex, where no above-ground physical evidence remains;</td>
</tr>
<tr>
<td>Feature</td>
<td>Component or element of a landscape including human structures, sites or complexes, as well as natural features eg avenue of exotic trees, alluvial deposit containing gold;</td>
</tr>
<tr>
<td>Linear</td>
<td>Network (long narrow landscape or landscape component, such as a road or transport route and its associated elements, including stopping places, watering holes, stockyards, camps etc).</td>
</tr>
</tbody>
</table>

More straightforward working definitions have been adopted for use in this project, consistent with common usage, to promote understanding of this report in the field. They are:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place</td>
<td>Site, area, building or other work, group of buildings or other works together with associated contents and surrounds. It is a specific location where a human activity has been undertaken, that shows physical evidence of that activity (or may show no physical evidence where the activity was an event).</td>
</tr>
<tr>
<td>Structure</td>
<td>The standing physical remains of a deliberately-constructed feature associated with human activity, such as a hut, building, fence or wall.</td>
</tr>
<tr>
<td>Feature</td>
<td>A visible component of a place or landscape.</td>
</tr>
</tbody>
</table>

In practical project terms, 'site' and 'place' can be considered interchangeable, although 'place' is more descriptive of the fabric in its setting. Landscapes are defined in the main report.

Other (terms as defined in the Burra Charter):

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural significance</td>
<td>Means aesthetic, historic, scientific or social value for past, present or future generations.</td>
</tr>
<tr>
<td>Fabric</td>
<td>Means all the physical material of the place.</td>
</tr>
</tbody>
</table>

Conservation

Means all the processes of looking after a place so as to retain its cultural heritage significance. It includes maintenance and may according to circumstance include preservation, restoration, reconstruction or adaptation and will be commonly a combination of more than one of these.

Preservation

Maintaining the fabric of the place in its existing condition and retarding deterioration.

Restoration

Returning the existing fabric of a place to a known earlier state, by reassembling components or removing accretions, without the introduction of new materials.

Reconstruction

Returning a place as nearly as possible to a known earlier state of the fabric, by the introduction of old or new materials.

Adaptation

Modifying a place to suit a proposed compatible use.

E. HISTORICAL UNITS

There has been a tendency, particularly noticeable after conversion to decimal currency, and later to metric measurement, to convert units of measurement, weight and currency contained in historical sources to modern units. Many reports accessed during this project have converted these historical units. In this report, the historical units have been used, and conversions attached in brackets only where deemed necessary.

The conversion of pounds (£) to dollars was commonly practised in reports from the late 1960's and 1970's, but this promotes ambiguity - has the author converted by multiplying by two, or converted according to contemporary commodity price, or converted by current dollar value relating to economic criteria? With gold production, the gold price (fine gold) was constant at a little over £4 per ounce from 1851 to 1930. Values of production in pounds from this period can be roughly converted to ounces of production by dividing by 4 (similar calculations cannot be applied to base metals, whose prices fluctuated).

World-wide, the unit of gold weight is and has always been troy ounce, not kilogram, and world prices are now set in $US per ounce. Comparative analysis is often complicated by the need to reconvert productions quoted in kilograms or grams to production in ounces.

The use of the original units is important, because they convey levels of meaning that may be lost in conversion. For instance, a quoted 500 ounce production figure can mean exactly 500 ounces, or it can be a rounding of the exact production figure. Conversion to kilograms (15.55) eliminates the latter possibility. The same can apply to distances ("20 miles to the north...."). In mining, adit (tunnel) levels were commonly spaced 100 feet vertically apart, a nominal figure relating to mining constraints. This is lost in conversion to 30.2m.
APPENDIX 5

GLOSSARY
OF MINING TERMS
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adit</td>
<td>Horizontal mine opening (tunnel from surface).</td>
</tr>
<tr>
<td>Alluvial (gold, tin)</td>
<td>Derived from the erosion of primary orebodies (reefs), and concentrated by water action.</td>
</tr>
<tr>
<td>Amalgamation</td>
<td>(Plate amalgamation). Recovery process that uses mercury-coated copper plates to trap gold particles contained in a water slurry that is passed over them.</td>
</tr>
<tr>
<td>Auriferous</td>
<td>Gold-bearing.</td>
</tr>
<tr>
<td>Battery</td>
<td>(Stamp battery). Machine for crushing auriferous quartz or 'cement', to liberate gold. Based on the principle of the mortar &amp; pestle, it consists of a set of heavy iron-shod stems (stamps) which are lifted and dropped in turn into a heavy cast-iron mortar box.</td>
</tr>
<tr>
<td>Bedrock</td>
<td>The strata (solid rock) on which the gold-bearing gravels rest.</td>
</tr>
<tr>
<td>Boiler</td>
<td>Large iron-clad cylindrical water vessel, used for making steam under pressure.</td>
</tr>
<tr>
<td>Cement</td>
<td>Auriferous quartz-gravels bound or cemented together with typically a ferruginous or siliceous cement.</td>
</tr>
<tr>
<td>Chlorination</td>
<td>Recovery process that uses chlorine gas or chlorine solutions to dissolve gold.</td>
</tr>
<tr>
<td>Cyanidation</td>
<td>Recovery process that uses dilute cyanide solutions to dissolve gold.</td>
</tr>
<tr>
<td>Deep Lead</td>
<td>Ancient, buried river bed (palaeo-river). Within the study area, these occur principally as linear deposits under a basalt cap, at the highest parts of the Alps.</td>
</tr>
<tr>
<td>Furnace</td>
<td>A structure in which ore or mineral concentrates were heated to break down metallic sulphides, to assist metal recovery.</td>
</tr>
<tr>
<td>Hydraulic Sluicing</td>
<td>Use of high-pressure water to break down banks of gold-bearing earth or gravel.</td>
</tr>
<tr>
<td>Inclined Tramway</td>
<td>Common method of conveying ore from mine to treatment plant in steep, mountainous areas. Generally double-acting, with a full truck descending, and an empty truck raised. Motion controlled by a brakeman at top.</td>
</tr>
<tr>
<td>Jet Elevator</td>
<td>Used during hydraulic sluicing operations, and consisted of a venturi which used high-pressure water to raise gold-bearing gravels from the bottom of a dam below the working face to a sluice box.</td>
</tr>
<tr>
<td>Mullock</td>
<td>Waste rock generated during mining operations.</td>
</tr>
<tr>
<td>Orebody</td>
<td>Economically-viable mineral deposit.</td>
</tr>
<tr>
<td>Reef</td>
<td>Quartz orebody, contained within the solid bedrock. In the Alps, the reefs are like ‘sheets’ of quartz, commonly from a few centimetres to 2 metres in thickness, and steeply-dipping. The gold usually occurs as fine particles distributed throughout the quartz matrix.</td>
</tr>
<tr>
<td>Shaft</td>
<td>Vertical mine opening.</td>
</tr>
<tr>
<td>Sluice box</td>
<td>Long, wood or iron trough through which sluiced gravels were passed in a stream of water. Heavier gold or tin particles were trapped in the base of the sluice, behind riffles or in coarse matting.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sluicing</td>
<td>Use of running water to break down banks of gold-bearing earth or gravels.</td>
</tr>
<tr>
<td>Stanniferous</td>
<td>Tin-bearing.</td>
</tr>
<tr>
<td>Truck</td>
<td>Oblong iron box on flanged wheels, running on rails in mine workings, for the conveyance of excavated materials.</td>
</tr>
<tr>
<td>Underlay Shaft</td>
<td>Angled shaft that follows the dip of an orebody.</td>
</tr>
<tr>
<td>Water race</td>
<td>Horizontal ditch that conveys water diverted from a creek or river to a mining operation.</td>
</tr>
<tr>
<td>Wash (washdirt)</td>
<td>Auriferous gravels.</td>
</tr>
<tr>
<td>Wolfram</td>
<td>Ore of tungsten.</td>
</tr>
</tbody>
</table>
APPENDIX 6: BIBLIOGRAPHY

Written References:


Anderson William, Report on the Kiandra Goldfield, Department of Mines NSW, 1887.


Auhl Ian, Marflette Denis, Australia's Earliest Mining Era, South Australia 1841-1851, 1975.

Australian Mining Standard, Prospecting on the Borders of N.S.W. and Victoria, 1897.

Australian Mining Standard, 3rd August 1899.


Barrow Graeme (Ed), John Gale's Brindabellas and Australian Alps, 1985.


Booker F.W., Black Mountain Mine, Coolemon Plains, 1939, Department of Mines NSW.

Bradford W, Harrietville Goldfield, Bulletin 11, Department of Mines Victoria.


Croll Robert, *Along the Track, To the Bogong High Plains, Dungey's Track*, 1929.

Dargo Prospect, Exploration Lease 1956, Map.


Department of Mines NSW, *Robyn's Tunnel, Kiandra*, 1933.

Department of Mines NSW, *Cahills Reef, Tantangarra*, 1909.


Department of Mines Victoria, *Dart River and Zulu Creek Gold-fields, Report No 1*, 1938.

Department of Mines Victoria, *Dart River and Zulu Creek Gold-fields, Report No 2*, undated.

Department of Mines Victoria, *Map of the Eastern Portion of the Colony of Victoria, showing Mining Tracks cut by the Department of Mines*, 1904.

Department of Mines Victoria, *Topographical Sketch of Mt Bogong & surrounding Ranges, Map*, 1886.


Erskine John Elpinstone Capt., *A Short Account of the Late Discoveries of Gold in Australia 1851*, reprinted in 1957.

Executive Committee, *Back to Cooma Celebrations*, 1926.

Exploration Licence No 665, Jindabyne, New South Wales.

Fairweather Keith McD, *Brajerek, Mining at Omeo and Glen Wills*, 1983.


Flett James, *Grant and Crooked River Historical Notes*, 1959, Unpubl.
Flett James, *Grant-Crooked River Diggings*, undated.


Golden Ridge Prospect, Exploration Lease 1667.


Green T., *Gold Prices Table from 1344 to 1978*, Prepared for The Gold Information Centre.


Hall L.R., Lloyd J.C., *Geology of the Snowy Mountains Area, Progress Report No 1 Toolong, Annual Report*, 1950, Department of Mines NSW.

Hall L.R., *Reconnaissance Geology of the Snowy Mountains Area, Progress Report No 3 Summary, Pingut-Plain Creeks Area*, 1951, Department of Mines NSW.


Harper L.F., *The Sutherland Lode, Kiandra District, Annual Report*, 1926, Department of Mines NSW.


Hixon Hiram W., *Notes on Lead and Copper Smelting and Copper Converting*, 1908, 4th ed.


Lanton, *Dargo Area, Exploration Lease 442, Endeavour Oil Co, Expired Exploration Licence Returns, MPV.*


Lawrence Dr Ruth, *Residents of the Upper Dargo Valley*, 1998, unpubl


McClatchie L., *Cobalt in the Cooleman Caves Area*, 1964, Department of Mines NSW, Geological Survey.


Mcmanus J.B. & Ringis J., *Jacobs River Copper Prospect*, May 1964, Geological Survey NSW.


Murphy John, *Barr's Creek, A Mystery of the Upper Murray*, 1998.


Quarterly Returns, Dart River Mining Pty Ltd, Exploration Licence No 149, 1972.

Quarterly Report, Mining Registrar, December 1861, Department of Mines Victoria.

Quarterly Report, Mining Registrar, June 1865, Department of Mines Victoria.

Quarterly Report, Mining Registrar, September 1865, Department of Mines Victoria.

Quarterly Report, Mining Registrar, March 1866, Department of Mines Victoria.

Quarterly Report, Mining Registrar, September 1866, Department of Mines Victoria.

Quarterly Report, Mining Registrar, June 1879, Victorian Department of Mines Victoria.

Quarterly Report, Mining Registrar, December 1879, Department of Mines Victoria.

Quarterly Report, Mining Registrar, December 1884, Department of Mines Victoria.

Quarterly Report, Mining Registrar, June 1885, Department of Mines Victoria.

Quarterly Report, Mining Registrar, March 1887, Department of Mines Victoria.

Quarterly Report, Mining Registrar, June 1887, Department of Mines Victoria.

Quarterly Report, Mining Registrar, September 1887, Department of Mines Victoria.

Quarterly Report, Mining Registrar, June 1888, Department of Mines Victoria.

Quarterly Report, Mining Registrar, March 1889, Department of Mines Victoria.

Register of the National Estate, *Kiandra Mining Area Kiandra NSW*, 1978, database No. 001056, file No. 1/08/284/0004.


Upper Dargo Prospect, Exploration Lease 1956 report.


Young Lamont, *Report on the Kiandra Gold field, and a Water Supply for the Same*, 1880, Department of Mines NSW.

**Web-Based References:**

*Government:*


Other:

Some useful American web sites:
www.alpinecounty.com/history.html (Alpine County local history)
www.buttameric.com/labor.htm (historic labour themes, Montana)
www.econ.uiuc.edu/~slavrev/upenn/fall94/melancon.html (Lena River goldfield, Siberia)
www.goldminetours.com/mkminetour.htm (Cripple Creek, Colorado)
www.leadville.com/miningmuseum/ (The National Mining Hall of Fame & Museum, Colorado)
www.miningcamps.com (mining ghost towns, Colorado)
www.mininglinks.com/alluvial/gold.html (world gold history overview)
www.nps.gov/klgo/ (National Parks Service – Klondike)
www.silverton.org/ghostjeep.html (Silverton, Colorado – Alpine ghost towns & trails)

Other useful web sites, world:
www.nzsouth.co.nz/goldfields/cromwell.html (Otago goldfields, NZ – heritage trail)
A. PREVIOUS REPORTS

THE REPORTS:

Reports on the mining cultural heritage of the Alps are limited, and this project has been commissioned to provide the first Alps-wide study.

Victoria:

In Victoria, an ambitious state-wide project was undertaken in the 1990's to systematically research, identify, record and assess historic gold mining sites. Summary goldfields histories were included, and sites ranked at Regional or State cultural heritage significance were elaborated on in Site Gazetteers. This process extended through the Victorian section of the Alps, and the results of this work provide a yardstick for assessing other sites that might come to light. In Victoria, mining of metals other than gold was rare, and historically, no major metals mines developed. The project was therefore able to encompass the few metals mines that existed. Earlier Land Conservation Council (LCC) assessments were built on by this project, as well as the databases of the Historic Places Section, Department of Natural Resources & Environment.

Recent CRA studies related to Regional Forest Agreements did not significantly add to the Victorian Goldfields Project lists. The Victorian Alpine Huts Heritage Survey (1996) identified several huts within the Alpine National Park with mining associations.

The other authoritative reports undertaken within the study area were done in the early 1980's by Dr Peter Milner, at the Mt Wills Goldfield, for the National Trust of Australia (Victoria), and the Dart River Historic Zones of the Dartmouth Unit of the Alpine National Park. These covered a large number of individual quartz mining sites, but were narrow in their assessments, being particularly concerned with the technologies of the sites.

Neither the state-wide Historic Gold Mining Sites Assessment Project (Victorian Goldfields Project) in the 1990’s, nor Peter Milner’s work in the Dartmouth Unit of the Alpine National Park and Mt Wills Historic Area in the 1980’s, produced any real form of cultural assets inventory. The former was a comparative study that selectively targeted sites of potentially high significance in the region, and the latter was a technological study that selectively targeted treatment plants, and particularly machinery remnants.

In summary, the key reports are:

"Historic Gold Mining Sites in the North East Region of Victoria, Report on Cultural Heritage & Site Gazetteer", D Bannear, 1999 (Victorian Goldfields Project, DNRE);
"Historic Gold Mining Sites in the Gippsland Mining District, Report on Cultural Heritage & Site Gazetteer", D Bannear, 1998 (Victorian Goldfields Project, DNRE);
Unpublished state-wide database of visited sites, D Bannear, undated (Victorian Goldfields Project, DNRE);
New South Wales:

The NSW National Parks & Wildlife Service maintains a database of historic sites, and the Kosciusko Huts Association has recorded some 239 huts. These include historic mining sites and mining-associated huts, but the former at least do not have the level of recording expected of heritage studies (neither is that level of recording its purpose).

Mike Pearson's 1979 work on the northern half of the Kosciusko NP remains the only authoritative study, and knowledge of historic mining sites was not significantly advanced during the recent Comprehensive Regional Assessments.

However, there is a good deal of privately-published material on the mining heritage of the Snowy Mountains, and this is dealt with later in this section.

In summary, the key reports are:

"A Report on the Mining History & Remains in the Northern Half of the Kosciusko National Park", M Pearson, 1979 (NPWS);
"Thematic Forest History and Heritage Assessment (non-indigenous)", Southern CRA Region, 1999.

Quality:

In general the quality of information presented in the reports is good, within the criteria under which they were compiled. The reports are well-referenced, which has assisted additional research undertaken for this project.

GAPS:

Previous Identification:

Debbie Argue, in her "Cultural Heritage Research & Implementation Strategy" (AALC, 2000), identifies gaps in our knowledge of the "Utilising Natural Resources: Mining" historic theme. These gaps are in relation to significance assessment and while there are separate lists for each management unit (park, reserve etc), the following are consistently listed:

- History & site-related reports have not been synthesised into the history of mining in the Alps;
- Comparative data to assess (national) significance has not been compiled.

Specifically for Kosciusko National Park, she notes that:

- Site-related reports are too narrow, and need to be broadened to encompass a wider range of mining-related effects, to tell the whole story of mining in the Alps.

Assessed Gaps:

The conclusions reached by Debbie Argue are fully agreed with. However, in the overall documentation of mining in the Alps, the following gaps are also recognised:
• In both the Victorian and New South Wales section, virtually no authoritative surveys of sites have been undertaken, and site recording is limited in both photography and description;
• In the NSW section, little comparative data has been presented that enables assessment of significance beyond regional level;
• In both the Victorian and New South Wales section, no mining cultural landscapes have been authoritatively described or recorded;
• The full regional extent of mining has not been recorded;

In general, the gaps above are not presented as criticism of previous reports - rather, they indicate that reports have not been commissioned in these areas to date.

In Victoria, several mining and other heritage surveys have been detailed and comprehensive within narrow criteria (machinery sites, huts etc), but exclude the workings themselves, the miners, and the wider stories of fields themselves. These projects themselves cannot be criticised for their output - rather, they show that mining has tended to be looked at as compartmentalised.

That is, mining consists of machinery sites to be examined by engineers, of huts to be examined by heritage architects, of excavations and occupation sites to be examined by archaeologists, and of stories to be left to the interest of local historians. Full-site assessments are needed, because features or objects that are not significant in themselves may be highly significant as parts of a whole.

Databases:

Relevant databases:

A number of databases are held by the various management agencies in the Australian Alps reserve system. The principal relevant databases are:

• Historic Places Section, Department of Natural Resources & Environment (Vic), mining historic sites database;
• Kosciusko Huts Association (NSW) - huts database;
• National Parks & Wildlife Service (NSW), historic sites database - Kosciusko National Park;
• Parks Victoria (Vic) Heritage Database (Asset Management System);
• Victorian Goldfields Project database.

Compatibility:

Compatibility of the relevant heritage databases has recently been examined in detail during the various "Data Audit and Analysis for the RFA Regions" projects undertaken as part of the Regional Forest Agreement process. Databases audited include Register of the National Estate, NPWS & DNRE, National Trust etc, and they were assessed against Australian Heritage Commission (AHC) minimum data requirements.

There is no advantage to be gained in repeating the compatibility process here, and suffice to say that significant variation in the type, quantity and quality of the information occurred.

The AHC minimum data requirements are:

• Name (of place or site);
• Other names (of place or site);
• Place category (AHC categories);
These requirements serve to identify a place. A description of the physical and historical characteristics of the place should also be included.

For the Alps, the Cultural Heritage Research & Implementation Strategy project (2000) established that "all Agencies would welcome the formation of an Alps-wide database of cultural heritage values and reference list" (p17). Implicit in this is the desirability of a standard database. Logically, this in turn should conform to AHC minimum data requirements.

In Jane Lennon & Associates "The International Significance of Cultural Values of the Australian Alps" (1999, AALC), the incompatibility of several existing Alps-related heritage databases is demonstrated. A 'Combined Database' (combining all the different fields used, but still not conforming to AHC minimum requirements) is presented, but not proposed.

**Databases adopted for this report:**

There is no clear guidance in this matter, and the attached databases (spreadsheets) of Alps mining sites are presented with fields matching the Victorian Goldfields Project's databases (spreadsheets).

**B. HISTORICAL SOURCES**

**GENERAL:**

A range of contemporary historical sources relating to mining in the Australian Alps exists. These include Mines Department & Geological Survey records, newspapers, diaries, archival records, maps etc.

**DEPARTMENTAL RECORDS:**

In New South Wales, the Department of Mines and Geological Survey records begin in 1875, and before that, administration of mining was vested in the Department of Lands. Pre-1875 records are fragmented, with administrative functions variously delegated, and archival searches are required to retrieve data. In addition, some of the Department of Mines records from 1875-1882 were destroyed in a fire. However, surviving Department of Mines and Geological Survey records are available online as digitised images through the Department's web-page, and excellent search facilities are included.

In Victoria, the Department of Mines and Geological Survey published records are more complete and comprehensive (as would be expected with the state's pre-eminence in nineteenth-century mining), and are particularly strong for the period late-1850's to early 1900's. Accessibility is not as good as in New South Wales, and searches must be carried out at the Geological Survey Library in Melbourne. Indexing is very poor, although the Geological Survey is undertaking construction of the VicMine database, which may eventually be available on-line. Actual lease and claim records are archived.
Departmental records in both states include expired Exploration Licence returns, relating to relatively recent mineral exploration in areas that have now been reserved. These are very useful, and often include well-researched histories, and plans showing the locations of historical mining activity.

In New South Wales, reconnaissance geological surveys of the Snowy Mountains area have provided a wealth of information, including bibliographies, Annual Report extracts, and detailed geological maps showing historical workings. These surveys were undertaken in the late-1940's to early 1950's, and published in Departmental Annual Reports & Technology Reports. Some are available on-line.

ARCHIVAL RECORDS:

Various mining-related records are housed in the State Archives of Victoria and New South Wales. These include lease and claim records, miners' right records, local court records, etc. No attempt has been made to access these for the project.

NEWSPAPERS:

Local newspapers are an excellent source for historical mining information, particularly for day-to-day activities on the various mines and fields. The quantity and quality of the information varies in proportion to the importance of mining in the local area. No attempt has been made to systematically review newspaper sources for this project.

C. PUBLISHED HISTORIES

BOOKS:

Numerous popular histories have been published on mining in Australia's south-eastern ranges. Victoria has been well-serviced, with Rob Christie, Brian Lloyd, John Morrow and Keith Fairweather each publishing a number of well-researched books, whose subjects extend into the study area. In the New South Wales section, the only popular history published specifically on mining is the Cooma-Monaro Historical Society's 1959 book on Kiandra.


WEB-PUBLISHED HISTORIES:

Several web-published histories have been used in this report, particularly to provide global context. Addresses are listed in the Bibliography. NSW Department of Mineral Resources' "MinFacts" sheets have provided useful historical and production data. They are available on-line.

D. ORAL SOURCES

Oral history sources are available on mining throughout the Australian Alps, and have been summarised by Sue Hodges in "A Bibliography of Oral Histories on the Australian Alps" (AALC 1993). Oral histories contained in popular publications by authors such as Klaus Hueneke and Tor
Holth have provided much useful information, and offer a lively cultural counterpoint to the dry Departmental recording.

In some small isolated mines and diggings in the Kosciusko National Park, oral histories provide the only information to flesh out what may have been a single-line mention in a Departmental publication. This has the potential to distort interpretation of these sites, where the oral histories may refer to later workings.

Oral histories often contain factual errors, resulting from the transmission of stories through a chain, embellishment, or the simple vagaries of memory. Confirmation is difficult, if similar variations have a common original source. However, these factual errors can have cultural validity, where they contribute to the associative themes that have built the folklore of the Australian Alps ('tall-tales-and-true').

E. OTHER

Various other published materials have been accessed to provide information for the documentation of mining in the Australian Alps. Of particular use have been a number of bushwalking guides, relating to the Snowy Mountains region in NSW. Some have provided good maps with locations of historic mining operations accurately marked. The texts frequently offer background historical information, oral histories, site descriptions, and access notes. A few sketch plans of mining sites are included. The most useful books have been "Bushwalking in Kosciusko National Park", C Warner, 1983, and "Best Bushwalks in Kosciusko National Park", H Hill, 1996.
APPENDIX 8

MINING SITES & LANDSCAPES

A. MINING FIELDS/ MINED OCCURRENCES p 175
B. KNOWN SITES - DEFINITION 194
C. SITES 195
D. KNOWN MINING LANDSCAPES 199
E. POTENTIAL HISTORIC MINING SITES 201
A. MINING FIELDS/MINED OCCURRENCES

ALPINE NATIONAL PARK, BOGONG UNIT

The Bogong Unit of the Alpine National Park has seen a considerable amount of gold mining undertaken, and it contains the only mine within the study area that is still producing gold, the Red Robin. Historically mined localities are:

**Big River:** Gold mining has been carried on along the Big River, which rises on the slopes of Mt Bogong. That mining which has so far been located has occurred within the boundaries of either the Dartmouth Unit of Alpine National Park or Mt Wills Historic Reserve, and is described under the relevant sections. However, there may be some workings inside the boundary of the Bogong Unit. These would probably be limited to minor high-terrace sluicing works, but there is a possibility of small-scale reef workings.

*References in Dartmouth Unit section.*

**Cobungra River:** The Cobungra River was worked extensively for gold, but most of the river diggings that were worked from 1857 are outside the Park. However, sluicing workings continue right to the headwaters, which were rushed in 1867, and are within the Park boundaries. Chinese miners figured prominently in the Cobungra river diggings. The best-known mine associated with the Cobungra is the Brandy Creek Mine, which is within the Park. This was worked at various times from the 1860's to the early 1900's, and large volumes of washdirt were removed and processed, by hydraulic sluicing and tunnelling on leads buried under basalt. A battery was installed to crush cement. Several small quartz workings exist in the upper Cobungra.


**East Branch, Ovens River:** This watershed is an extension of the Upper Ovens Goldfield, that has a recorded gold production well in excess of a million ounces from reef mining and bucket dredging alone, and an estimated production in the order of two million ounces. The East Branch has a large number of reef mines that operated from the 1860's to the mid-1900's, the largest recorded production being from the United Miners, with almost 20,000 ounces. Well in excess of 500 auriferous reefs were registered at Harrietville, and it could be reasonably expected that around 30% of these would have been within the East Branch watershed. Alluvial mining was carried out along the length of the branch from the late 1850's, consisting of river workings and sluicing of the adjacent banks. Chinese miners figured prominently in these works, and a major chinese encampment was situated on the East Branch, just outside the Park boundary. Extensive hydraulic sluicing was carried out, including sluicing of high-level stranded leads. Tailings from bucket dredging in the early 1900's show in the lower reaches of the river. Heritage features within the Park are abundant, including relic machinery & equipment sites, inclined & level tramways, mining tracks (including Department-cut tracks), hut & camp
sites, water races, and the myriad of mining features associated with the reef and alluvial diggings.

Bradford, W, "The Harrietville Goldfield", 1903 (Bulletin 11, Geological Survey of Victoria);
"The Harrietville Gold Field" (map), 1914 (published 1940, Geological Survey of Victoria);

Fainter: This is a small alluvial gold field, situated on the Bogong High Plains in the shadow of Mt Fainter. It was discovered and worked in 1862, and rushed in 1895. It was sporadically worked into the 1900's. Workings occur on two streams, and production, while unrecorded, is not likely to be significant.

Report of Progress No 5, 1878 (Geological Survey of Victoria) - Map of Bogong & Dargo;
"Topographical Sketch of Mt Bogong & Surrounding Ranges", Victorian Department of Mines, 1886.

Hotham Heights: This is a widespread field covering the tops of Mt Hotham & Mt Loch, and the watersheds of the Diamantina and upper West Kiewa Rivers. It was the scene of the last gold rush to the mountains, when a huge area of the high country was pegged following Bill Spargo's discovery of the phenomenally-rich surface outcrop of the Red Robin reef in late-1940. The field contains only sporadic and generally minor quartz workings. The exception is the Red Robin Mine near Mt Loch, which has worked almost continuously from 1941 to the present day, and produced in the order of 10,000 ounces of gold.

Kenny, J, "Red Robin and One Alone Reefs, Hotham Heights", 1941 (in Mining & Geological Journal, September 1941, p263);

Middle Creek: Alluvial gold mining has been recorded in the watershed of Middle Creek, the main western tributary of the Big River. It is not known at this stage if these diggings have any expression within the Park.

Quarterly Reports, Mining Registrars, March 1887 (Vic Department of Mines), p9.

Mt Feathertop: Quartz mining has been recorded on Mt Feathertop, but sites have not been located.

Lloyd, B, "Gold at Harrietville", 1982, p16 - Quartz lease no 945, Albert QMC, 18/12/1866.

Upper Big River: An isolated patch of alluvial gold diggings is known on the upper Big River, and appears to be completely contained within the Bogong Unit. It was worked by Collins & Gose prior to 1886, and the gold is referred to as "heavy" (coarse).

"Topographical Sketch of Mt Bogong & Surrounding Ranges", Victorian Department of Mines, 1886.
**Upper Dargo:** The Upper Dargo goldfield covers a considerable area, and includes the watershed of the upper Dargo River, as well as some of the adjacent Dargo High Plains. While some workings appear to have been undertaken before 1860, the Upper Dargo was opened up in 1863 with a series of small rushes. Several townships and supply camps were established, notably Mayford, Louisville and Brocket on the river, and Verdun on the Dargo High Plains road (all within the Park). Workings are extensive and include the high-level basalt-covered alluvial workings of Boiler Plain, Tabletop & the Dargo High Plains (western edge), sluicing workings along the length of the upper Dargo (with strong Chinese presence), and a large number of generally small reef workings. It includes workings on tributaries such as Pykes Creek and Little Dargo River. Heritage features are abundant, and include relic machinery & equipment, former town and mining camp sites, hut remnants, tracks, water races, river diversions, hydraulic & ground sluicing workings, reef workings & associated features, etc.


**White Horse Creek:** At least one isolated quartz mine is known in the headwaters of White Horse Creek, a western tributary of the Big River. It was worked by Dow & party prior to 1886, but no other details are to hand.

"Topographical Sketch of Mt Bogong & Surrounding Ranges", Victorian Department of Mines, 1886.

**Wongungurra River:** Isolated reef and alluvial diggings have been reported in the upper reaches of the Wongungurra, within the recent Park extension.

*No written references to hand.*

**ALPINE NATIONAL PARK, COBBERAS-TINGARINGY UNIT**

Mining of a limited extent has been carried out within this Unit. This includes gold and base metal mining. Among the more interesting features are the tracks cut by the Victorian Mines Department to facilitate prospecting in the Upper Murray area.

**Buckwong Creek:** Alluvial gold was worked in the head of Buckwong Creek in the late 1890's, and some good patches of gold were reportedly found.

"Headwaters of the Murray", 1897, Australian Mining Standard, March 11, p1724.

**Buemba Flat:** Alluvial gold was discovered by Melbourne parties in 1865 at 'Buemba Flat' in the headwaters of the Buemba River. The Unit boundary with Cobberas-Tingaringy cuts through the flat, and it has not been established if the diggings are in either or both Units.


**Cowambat Creek:** A little gold was obtained in the head of the Cowambat Creek, a tributary of the Murray River, upstream of Limestone Creek.

Delicknora Creek: The far eastern boundary of the Park abuts Delicknora (McLaughlan's) Creek in places. A mainly reefing goldfield exists on the eastern side of the creek (outside the Park), and the creek itself has been referred to as unpayable. However, some prospecting or other works may exist within the Park.


Limestone Creek Goldfield: This small field was opened following the cutting of Mines Department tracks in the 1890's. Workings are limited, and consist of a number of separate alluvial diggings along Limestone Creek, and its tributaries. Some hydraulic sluicing was undertaken, and a few quartz reefs were opened. Production is not recorded, but is likely to be low.

Quarterly Reports, Mining Registrars, September 1887 (+ map); "The Australian Mining Standard", 11 March 1897, p1724 (+ map).

Limestone Creek Base Metals: A number of small base metal deposits were opened in the upper Limestone Creek watershed around 1900. They included copper, iron and silver/lead prospects. Works consisted mostly of trenching, and no production is recorded.

Dunn, E J, "General Geological Notes on the Country Between Omeo and Limestone Creek, County of Benambra", 1906 (Records of the Geological Survey of Victoria, Vol II Part 2, pp129-131);

Murray River: Gold mining was undertaken on the Upper Murray from about 1868, and while it was mostly fine, a 5 ounce lump was recorded. Small gold diggings are recorded on the Murray River, just upstream of the Buckwong junction. More extensive diggings and a water race are recorded near the junction of another creek (possibly Rough Creek, but near the former McGregor's Hut).

Murphy, J, "Barr's Creek, A Mystery of the Upper Murray", 1998, p40.

Shady Creek: Gold was mined in the 1850's near Mt Pinnibar in the headwaters of Shady Creek, a tributary of Wheeler's Creek. A mining camp was established, but it has not been established if the camp or any diggings are in the Park.


Tom Groggin: Gold is recorded in the vicinity of Tom Groggin, which is an island of freehold land within the Park. It is not known if any workings exist within the Park, or indeed on the NSW side of the river, in Kosciusko NP.


ALPINE NATIONAL PARK, DARTMOUTH UNIT

The Dartmouth Unit contains extensive gold mining areas, and several small base metals mines. Gold was discovered nearby at Omeo in 1851, and when serious work began there a few years later,
prospectors moving outwards opened up the Gibbo, Wombat Creek, and later other fields in more remote and rugged country. Alluvial gold production is poorly recorded. The principal fields are:

**Big River:** Alluvial gold diggings at the Big River, which rises at Mt Bogong, began in about 1860, with the main workings targeting river terraces. The river was worked from above the Mt Wills Creek junction to its junction with Mitta Mitta Creek, and Chinese and German miners were present. The first quartz reefs were opened in 1888, and a busy reefing area developed.

*Quarterly Reports, Mining Registrars, June 1887, pp 83-84 + map, Victorian Department of Mines;

**Buemba Flat:** Alluvial gold was discovered by Melbourne parties in 1865 at 'Buemba Flat' in the headwaters of the Buemba River. The Unit boundary with Cobberas-Tingaringy cuts through the flat, and it has not been established if the diggings are in either or both Units.


**Dane's Creek:** This locality is not precisely known, but is believed to be between Green's and Larsen's Creek. A silver/lead lode was opened here in 1906, although it had been discovered and prospected several years earlier. It was worked by two small open cuts, and no production is recorded.


**Dart River:** Only the southerly and westerly portions of this goldfield are within the Park. The first report of alluvial mining was in 1874, although gold may have been discovered at an early date. In 1883 a number of rich reefs were discovered. They were heavily-mineralised, and despite many attempts at various methods of gold-recovery, became unworkable at depth. The best year of production from this field was 1888, when 2000 ounces were taken out.


**Gibbo River:** The main early alluvial diggings of this goldfield are within the study area. Gold was mentioned in the Gibbo River by Rev Clarke in 1851-52, but alluvial mining did not begin until the mid to late 1850's. The river was worked intensively between Japan Creek and King's Creek by European & Chinese miners, some small claims yielding 100-250 ounces each. Tributaries such as Swift, Exhibition and Butchers creeks were worked. Minor diggings occurred sporadically along the length of the river, and some high-level basalt-covered deep leads were accessed by tunnels and by shafts. Some quartz mining was undertaken, from 1885. A large copper lode was found cutting across the Gibbo in the early 1900's, and the southerly extension (in Park) was drilled by the Mines Department in 1912. Subsequently a 33m adit was driven into the lode, and minor surface excavation done. It was further drilled in the 1960's, but no production was ever undertaken.


Green's Creek: This is a small reefing goldfield that supported a number of mines. The first reef was discovered in 1881. In 1906-7, a silver/lead deposit was worked via adits, by the Victoria Silver Lead Mining Co, but production is not recorded.


Larsen's Creek: Larsen's Creek is a southerly extension of the Green's Creek field, and reef gold has been mined.

Mitta Mitta River: Diggings on a deep lead under basalt, high above the Mitta Mitta River and about 4km downstream of the Gibbo junction, are mentioned in a 1906 report. Results were poor. Other minor diggings on basalt-covered wash are referred to along the Gibbo valley, just upstream of the junction. Minor base metal lodes (copper & silver/lead) are referred to on the spur between the Mitta Mitta and Gibbo rivers.


Wombat Creek: Wombat Creek rises on Mt Wills, and alluvial gold has been mined along its length, from 1861. Some claims were very rich, one said to have yielded 1000 ounces. Tributaries including Gill's, Mopoke, La Fontaine and Christmas Creeks have also been worked. Diggings along the main creek are extensive, and include higher terrace workings. Some quartz reefs were opened. Some silver/lead deposits were opened up in limestone on Wombat Creek, but no production is recorded. Alluvial tin deposits (derived from Mt Wills) are noted, but no production recorded.

Quarterly Reports, Mining Registrars, September 1886, + map;
Quarterly Reports, Mining Registrars, March 1889, App'x A, pp65-67;

ALPINE NATIONAL PARK, WONNANGATTA-MOROKA UNIT

Mining has been carried out in a number of locations within this Unit, but it is not particularly well-developed as a theme. Major mountain goldfields exist to the east, in the Jamieson-Gaffney's Creek-Woods Point-Walhalla belt.

Barry Range: A small number of gold-bearing quartz reefs were reported to have been opened up on the crest of the Barry Range in 1898. A crushing averaging 1½ oz/ton was taken from one, to the west of the Twins.

Geological Survey of Victoria, Progress Report No 9, 1898, p49.

Crooked River: The Park boundary adjoining the Grant Historic Area follows Crooked River, and some gold mining has been undertaken here within the Wonnangatta-
Moroka Unit. The Crooked River Goldfield is discussed in the Grant Historic Area section.

References in Grant Historic Area section.

**Dolodrook Creek:** An isolated occurrence of chromium ore exists near the junction of Dolodrook Creek and the Wellington River. This is referred to as the "Chromite Mine", and while the deposit was known from the early 1900's, the only work done on the site was exploratory drilling and the excavation of several costeans (trenches) in the 1960's.


**Howqua:** Some small-scale reef and alluvial workings extend into the Park, from the Howqua Hills Historic Area. Details on the Howqua Hills Goldfield are contained in Howqua Hills Historic Area section.

References under Howqua Hills Historic Area.

**Jamieson River:** A small goldfield is known on the upper Jamieson River, downstream of the Park boundary on the Jamieson. It is not known if any workings extend upstream into the Park.


**Moroka River:** Gold workings along the Moroka River are shown on an 1868 map of Victorian goldfields.


**Wonnangatta River:** An 1868 map of Victorian goldfields shows gold workings extending to the headwaters of the Wonnangatta River, from the old Waterford site to the foot of Mt Howitt. Gold is also shown along the length of the Humffray River, a tributary of the Wonnangatta.


**AVON WILDERNESS PARK**

There are no known mining occurrences within this Wilderness Park, although there remains a possibility that minor prospecting works have been undertaken.

**BIMBERI NATURE RESERVE**

Quartz reef workings are referred to on Mt Franklin, in the Brindabella Range, in 1914, and are probably within the Reserve. Alluvial gold workings exist adjacent to the Reserve on the Goodradigbee River, and it is possible that these workings extend into the Reserve. McGowan (1996) reported that these diggings appear to be confined to private property.
BRINDABELLA NATIONAL PARK

Lennon (1999) reported that a gold mining area is included among 17 historic sites listed for Brindabella National Park in the NSW National Parks & Wildlife Services databases. This project has been unable to locate the entry. Rob Hunt, NPWS, Queanbeyan, was unaware of any historic mining undertaken within Brindabella NP, and had spoken to local residents, who were also unaware of historic mining activity. Mining and exploration for gold and base metals have been carried out in the Wee Jasper area to the north-west and in the Goodradigbee valley to the west, and the Park remains prospective for additional historic mining sites/areas.


GRANT HISTORIC AREA

Grant Historic Area contains abundant gold mining, including reef workings and alluvial diggings. The highest producing reef mine was the Good Hope, with over 20,000 ounces. Two closely-allied goldfields are included:

**Crooked River:** This field was discovered by a government-sponsored prospecting party in 1860, and by early 1861 there were 500 miners at work. A number of small townships developed along the river, with names such as Hogtown, Bulltown, Ramtown etc. Large amounts of alluvial gold were won, and the discovery of a huge number of gold-bearing reefs in 1864 promised a permanency and status to the field that did not eventuate. The number of miners in the Crooked River/Grant area rose to nearly 1300 in 1865. The river towns had virtually died by the 1880's. Alluvial diggings are along Crooked River and several of its tributaries, including Good Hope Creek and Jungle Creek. Northerly extensions of the field along the Good Hope Creek, 25-mile Creek etc are outside the study area.

Flett, J, "Grant and Crooked River - Historical Notes", 1959 (unpublished);

**Grant:** The township of Grant, with peak population 500, developed rapidly in response to the welter of quartz reef discoveries. However, the rich surface stone did not persist at depth, and Grant rapidly declined. Only one mine, the Good Hope, recorded significant production. The Historic Area does not cover all of the Grant district's reef mines.


HOWQUA HILLS HISTORIC AREA

Gold was discovered on the Howqua River in 1866, and a rush ensued to the alluvial diggings. The first of a number of quartz mines were opened in the hills to the south of the river in the same year.
While several mines were heavily capitalised and expensive plants were installed, the reefs were generally disappointing. Work extended into the early 1900’s, but gold recovery problems with the heavily-mineralised ores were never satisfactorily resolved. The last company to work, the Great Rand GMC, raised £32,000 to re-open the old Howqua United workings, but the project collapsed before any gold production was made. The main old Howqua township is outside the Historic Reserve, and only part of the alluvial diggings are included. Heritage features include sluice-workings, a diversion tunnel, water races, ruins of the processing plants (including a chimney from a smelter), tracks, adits and mullock dumps.

Stirling, J, "Report on Examination of Reefs at Howqua Valley", Appendix D, Quarterly Reports, Mining Registrars, Victorian Department of Mines, June 1888, + map;

KOSCIUSKO NATIONAL PARK

Mining has been carried out in a large number of relatively isolated locations within the Kosciusko National Park. Metals mined include gold, copper, silver, lead, [molybdenum] and tin. From north to south (approximately) the localities are:

Goobarragandra River: Small goldfields occur along this river, and include the Emu Creek, Dubbo Falls and Never Never Creek alluvial diggings. Stoke’s gold mine exists on the east side of the Goobarragandra, upstream of the junction with Peak River. Small mine workings exist on Waterfall Creek. There is an isolated quartz mine on Broken Cart Creek, and minor deep lead workings at Horseshoe. Production is not likely to be substantial. The Goobarragandra Mine worked quartz reefs. Copper workings on Stinking Creek, and tin & arsenic prospects on Pipers Creek, are outside the Park.

Markham NL, "Gold Deposits of the Lachlan Fold Belt", 1975 (Departmental Geological Survey Report);
Gilligan, L, "The Broken Cart Gold Mine", 1972 (Departmental Geological Survey Report);

Goodradigbee River: Some small alluvial diggings exist on this river, just outside the Park boundary, and it is quite probable that some workings exist within the Park. Vague mentions of gold occurrences on small tributary creeks to the west (towards the Cooleman area) exist.

"Feature Map of the Federal Capital Territory of the Commonwealth of Australia and environs", Federal Capital Commission (undated);
Barrow, G (Ed.), "John Gale's Brindabellas and Australian Alps", 1985 (selected sections of diary of John Gale);
"Particulars for Mine Records of Smaller Mines &c.", 1914, NSW Department of Mines.

Jounama Creek: A small copper deposit (Pether's Lode) was opened on Jounama Creek, a tributary of the Tumut River.
**Carne, J E, "The Copper Mining Industry and the Distribution of Copper Ores in New South Wales", 1908 (Mineral Resources 10, NSW Geological Survey).**

**Cooleman Plains:** At least two small base metal (silver/lead) mines exist in this area. The Black Mountain Mine was opened in 1889, and Hancox’s Mine, on a tributary of Cave Creek, before 1900. No production has been recorded. Two patches of alluvial gold diggings exist in the vicinity of Peppercorn Hill, and an historic grave is recorded.

*Booker, F W, "The Black Mountain Mine, Cooleman Plains, County Cowley", 1939 (Mine Report, NSW Department of Mines);*

*Mclatchie, L, "Cobalt in the Cooleman Caves Area", 1964 (Departmental Geological Survey Report);*

*“Geology of the Kosciusko National Park”, first ed, 1990, Bureau of Mineral Resources, NSW.*

**Lickhole Creek:** No details about a mine and hut on Lickhole Creek have been located to this stage.

*[Argue, D, "Cultural Heritage Research & Implementation Strategy", 2000 (AALC), p42].*

**Yarrangobilly/Yarrangobilly Caves copper field:** Various small mines and prospecting works exist within the caves area, and northwards to Yarrangobilly. A small mine was opened on Blue Creek to the south. The Rules Point Battery is located close the caves. Silver/lead was also mined at Yarrangobilly, from 1888. Gold workings are known.

*Carne, J E, "The Copper Mining Industry and the Distribution of Copper Ores in New South Wales", 1908 (Mineral Resources 10, NSW Geological Survey);*


*"Minchin's Gold Mine, Yarrangobilly", Mine Record 1944-1951, NSW Department of Mineral Resources.*

**Yorkies Diggings:** Small alluvial diggings exist on Yorkies Creek and Taylors Creek, west of Long Plain Road, and north-east of Long Flat Hut. Diggings include water races, sluicing workings, shafts, trenches, hut sites etc.

*Information contained on NPWS noticeboard at start of Long Plain Road, Rules Point.*

**Lobbs Hole (Ravine) copper field:** This area contains several copper workings, including the largest copper mining enterprises within the study area. Lobbs Hole Copper Mine was the highest producer, and mined several thousand tons of copper ore between 1874 and 1917. Some alluvial gold was produced from the Tumut River in this vicinity, and copper is known from O’Hehir’s (O’Hares) Crossing, just upstream of the junction of the Yarrangobilly Creek with the Tumut River. Copper has been worked in several places downstream of the junction, including at the Gaslight Mine, now submerged under the Talbingo Reservoir and outside the Park.

*Carne, J E, "The Copper Mining Industry and the Distribution of Copper Ores in New South Wales", 1908 (Mineral Resources 10, NSW Geological Survey);*
"Lobbs Hole Copper Mine, Yarrangobilly", Mine Records 1897-1963, NSW Department of Mines;
Mitchell, C, "Lobbs Hole Copper Mine", 1968 (NSW Departmental Geological Survey Report);

Upper Murrumbidgee: A few small alluvial gold diggings are known on tributaries in the headwaters of the Murrumbidgee River. These are the Tantangara Creek diggings (two places), Nungar Creek diggings, and the so-called Kiandra Creek diggings. At least one quartz mine, Cahills Reef, was attached to the Tantangara diggings.

Markham NL, "Gold Deposits of the Lachlan Fold Belt", 1975 (Departmental Geological Survey Report), p184;
Hooke, H, "Cahills Reef, Tantangara", 1909 (NSW Department of Mines Mine Record).

Kiandra: Discovered in 1859, this is the most economically important field in the Park, with production variously estimated at 180-200 thousand ounces of gold. The majority of this production occurred in the first few heady years, after an initial rush of around ten thousand people to the field. Gold production continued at a low level into the 1900's. The gold was derived from basalt-covered deep leads, and from recent alluvials derived from these. Quartz mining was a minor contributor. Tunnelling, shallow sinking, and ground & hydraulic sluicing were undertaken, as well as bucket dredging along the upper Eucumbene River. The major fields were Kiandra (including New Chum Hill, Township Hill etc), Three-mile, Four-mile, Six-mile, Nine-mile, upper Eucumbene and Giandarra. Other places include North & South Bloomfield, 8-mile diggings (8-mile Creek), Charcoal Reef & alluvial diggings, Simpson’s diggings, Lorna Doone Mine, Basalt Claim (Eucumbene River), and diggings near Edwards Hut. Heritage features are abundant, and include surface diggings, ground and hydraulic sluicing workings, adits, shafts, mullock dumps, water races & dams, town sites, relic machinery & equipment, dredge tailings etc.

Andrews, E C, "Report on the Kiandra Lead", 1901 (Mineral Resources No 10, NSW Department of Mines);
Moye, D G (Ed.), "Historic Kiandra", 1959 (Cooma-Monaro Historical Society);

New Maragle: This small field, opened in the mid-1870's, lies to the west of the Tumut River. The main diggings, along various tributaries in the headwaters (and adjacent creeks such as Yorkers), are outside the Park. One isolated deep lead tunnel under basalt appears to be within the Park. It is possible that there may be some diggings along the lower reaches of New Maragle Creek that are within the Park, but none are marked on surveys of the area. The nearest quartz mining was undertaken at Mt Pilot, to the west and outside the Park.

Hall, L, "Reconnaissance Geology of Snowy Mountains Area, Progress Report No 3: Summary, Pinchgut-Plains Creek Area", 1951, + map (included in Annual Report, NSW Department of Mines, 1951);

**Upper Tumut River:** Various small gold diggings exist on the upper Tumut River. These include the 15-mile, Tumut River, Sam's Diggings (deep lead), and The Gulf, as well as several unspecified alluvial diggings.


**Adaminaby:** Various small copper shows were opened in the vicinity of (Old) Adaminaby, but it has not been established if any are in the Park. The Kyloe Copper Mine, where about 60,000 tons of copper ore valued at more than a quarter of a million pounds were mined from 1901 to 1914, is outside the Park.

*Hall, L, "Snowy Mountains Area Geological Reconnaissance, Adaminaby" in Annual Report, NSW Department of Mines, 1951 (+ map), p83;*

**Mulligan's Creek:** Isolated gold diggings exist in the head of Mulligan's Creek, near its junction with Happy Jack's Creek.


**Bolton's Hill:** A small, isolated patch of diggings on tertiary gravels (deep lead) exists to the west of Mulligan's Creek, on a spur between Bolton's Creek and the Happy Jack's River.


**Crook's Racecourse:** Isolated alluvial gold diggings exist at Crook's Racecourse. These relate to the exposure of a basalt-covered deep lead. The Park boundary may cut through these workings.


**McGregor's Creek:** Alluvial gold was worked in the headwaters of McGregor's Creek. This small field is a northerly extension of the Crook's Racecourse diggings. No details have been found.


**Big Bogong:** Minor gold diggings are referred to at Big Bogong (Mt Jagungal) in 1895, but not identified.

*Annual Report, 1895, NSW Department of Mines, p131.*
Toolong: This small field consists of several alluvial gold diggings on tributaries of the Tooma River. The largest is on Dargal Creek. This was discovered in 1887, but was not systematically exploited until 1893. In 1895, 250 men were working the lead. The adjacent Broadway Flat was tried but abandoned, and a small tributary on the opposite side of the Tooma (near Toolong Station Homestead) was worked. To the north, gold was worked in small creeks near Ogilvie's Creek. A quartz leader above the Dargal Lead was opened. In 1895, total production of all the Toolong & Bogong Lead diggings was put at 900 ounces of gold, and it was proposed that about another year's digging would exhaust the field.

Annual Report, NSW Department of Mines, 1895, pp129-131 + plan;

Bogong Lead: Considered part of the Toolong goldfield, these small gold diggings are on Back Flat Creek, on the fall to the Geehi River. Alluvial diggings were opened in 1894, and a quartz reef (Bogong Reef, later called Grey Mare Reef) was located. Several quartz claims were worked along this reef. Production from the Grey Mare, which operated intermittently until at least 1950, is likely to be several thousand ounces (about 1000 ounces in 1902), making it the largest reef gold producer in the Kosciusko National Park.

Annual Report, NSW Department of Mines, 1895, pp129-131 + plan;
"Grey Mare Mine, Kosciusko", Mine Records 1895-1950, NSW Department of Mines.

Everard's Flat: Alluvial gold was recorded from the vicinity of Everard's Flat, on the Khancoban Creek, in 1896, but the workings were abandoned by 1897.


Gungarlin River: Several small gold diggings exist on the Gungarlin River and its tributaries. McDonald's (McDonnell's) diggings are near the head of the Burrungubugge River, and more extensive alluvial (and some reef) diggings exist on Digger's Creek. Four small patches of diggings north of Bull's Peak River are not in the Park. Dredge workings and the ruins of a dredge are situated just outside the boundary of the Park, on an eastern tributary of the Gungarlin River. Gold diggings referred to by Hueneke on Jumpers Creek appear to be in the broad vicinity of Botherum Hut.

Hall, L, "Snowy Mountains Area Geological Reconnaissance, Gungarlin-Burrungubugge Rivers" in Annual Report, NSW Department of Mines, 1951 (+ map);
Hueneke, Klaus: 3-Vol set of Alps oral histories, at NPWS office, Jindabyne.

Piper's Creek: Alluvial diggings exist on Piper's Creek, a tributary of the Snowy River, to the north of Perisher. These may be part of the "Crackenback Gold Field Extension", proclaimed March 1884.

Annual Report, NSW Department of Mines, 1896, p133;
Plan, Parish of Kosciusko, NSW Department of Lands, 1898.

**Thredbo/Snowy River Junction:** Gold diggings, including bucket dredging, at the junction of the Thredbo & Snowy Rivers (now part of Lake Jindabyne) have been referred to. Whether any of these diggings continue upstream, on either river, into the Park has not been established.


**Mt Kosciusko:** Gold deposits have been referred to in the vicinity of Mt Kosciusko. This reference may be to gold at Piper's Creek, Little Thredbo or Crackenback.

*Annual Report, 1895, NSW Department of Mines, p131.*

**Little Thredbo:** Early alluvial gold diggings, probably dating from the 1860's, exist adjacent to the Thredbo River, at Little Thredbo. Mining was still being carried out on a small scale in the 1890's. There are references to other (unspecified) diggings in the vicinity.

*Annual Report, NSW Department of Mines, 1896, p133; Map of Mt Kosciusko & Surrounding Districts, 1909 (NSW Gov’t).*

**Upper Mowamba:** Gold diggings are referred to in the head the Mowamba River. These include the Bark Huts and Snowy Plains diggings. Gold diggings also exist just outside the Park on Rendezvous Creek, a tributary of the Mowamba (the Golden Age quartz mine is in this vicinity, but outside the Park). It is possible that diggings continue into the Park.


**Crackenback Gold Field:** This is an early field, and was proclaimed in July 1868. The original discovery may have been shortly after that of Kiandra. Alluvial gold diggings exist on the Crackenback (Thredbo) River, to the south of Dead Horse Gap. These may be part of the Upper Mowamba diggings referred to above. Chinese graves have recently been reported in the area, but not confirmed (advice from D Corcoran, Ranger, NPWS, Jindabyne).

"Map of Mt Kosciusko & Surrounding Districts", 1909 (NSW Gov’t).

**Murray River:** Gold mining was undertaken on the Upper Murray from about 1868. While the gold was mostly fine, a 5 ounce lump was recorded. Small gold diggings appear to be marked on the NSW side of the Murray River, just upstream of the Buckwong River junction, on an 1897 map of the area.

"Headwaters of the Murray", 1897, Australian Mining Standard, March 11, p1724.

**Mt Pilot:** Tin, and some gold, have been worked in the streams which rise in the Mt Pilot area. While the area was mentioned by Rev Clarke in 1860, the field was not discovered till 1875. Creeks worked for alluvial tin include Tin Mine Creek, Little Tin Mine Creek, Martin's Creek (gold also), Pinch River (gold also) and Ingeegoodbe River. By 1892, numerous shafts had been sunk on stanniferous (tin-bearing) quartz
veins. In 1936 the Mt Pilot Company began work, but went into liquidation in 1938 after producing a little over a ton of concentrates.

Willis, J, "The Mount Pilot and Cathcart Tin Mines", 1970 (Progress Exploration Report);
"Mount Pilot Tin & Gold Deposits", Mine Records 1860-1956, NSW Department of Mineral Resources.

Southern Snowy River: Gold has been referred to at the junctions of the Pinch and Jacobs Rivers with the Snowy River. The latter is referred to as Jacob's Swamp. A copper deposit has been opened up on the Jacobs River, close to its junction with the Snowy, and a base metal deposit is known near Mt Trooper. Gold diggings on a Slaughterhouse Creek are not within the Park.

Annual Report, NSW Department of Mines, 1897, p159;
McManus, J, & Ringis, J, "Jacobs River Copper Prospect", 1964 (Departmental Geological Survey Report);
Markham NL, "Gold Deposits of the Lachlan Fold Belt", 1975 (Departmental Geological Survey Report), p189;

Delegate area: A copper/lead/silver/gold deposit on the Snowy River in rugged country between the Matong and Paupong Creeks is probably in the Park. Lode tin exists at the junction of Stony & Purgatory Creeks. A gold, silver & lead deposit being opened in 1898 in a locality known as the Black Scrub may be within the recent Park extensions. A copper mine that had been opened near Black Jack Range in 1881 is to the east of the Park, but exploratory shaft workings on primary deposits of gold and molybdenite at Black Jack Mountain in the early 1900's may be in the Park. Gold prospecting works on a large quartz reef were carried out at Stockyard Flat Creek, a tributary of Byadbo, in the Park. In the 1890's, evidence of alluvial gold prospecting works were noted in a terrace in Graham Collins' Gap, at the head of Jerry's Flat Creek, a tributary of Tingaringy Creek. This is within the Park. Gold workings at Snodgrass and Brown's Camp are outside the Park, although there is a possibility that prospecting or other works to the west of Brown's Camp may exist within the Park. To the north of the Snowy River, and to the west of Stony Creek, a line of mining leases that were current in the 1950's are contained within the Park. No details are known at this stage.


MOUNT BUFFALO NATIONAL PARK

Mount Buffalo National Park has a number of areas where mining for gold has been undertaken, all in peripheral locations. Total in-Park production is not known, but it is likely to be several thousand ounces, mostly from the Buckland River workings. The localities are:

Back Creek: Back Creek was a minor, predominantly reefing field south of Myrtleford, and some small-scale quartz workings are known to exist within the Park. The largest, Connor's Reef, was 4ft (1.2m) wide reef and worked to a depth of 125 feet (38m). It produced over 600 ounces of gold between 1867 and 1897.
**Buckland Valley:** A small section of the Buckland goldfield is included within the Park. The Buckland diggings were a rich north-east Victorian field that was opened with a rush of six to eight thousand miners in 1853. It is notorious for the Buckland riots of 1857, that saw about 2000 Chinese miners driven violently from the valley. Part of the Upper Ovens Goldfield, its gold production is very poorly recorded, but the total is likely to have been substantial, in the order of hundreds of thousands of ounces. Only a very small proportion of the field is in the Park, and none of the richest areas, or sites known to have been associated with the Buckland riots. Features within the Park include ground- and hydraulic sluicing sites, small-scale quartz workings, water races, dredge tailings (three different dredges), tracks etc. The dam wall remnants on the Buffalo Plateau (so-called "Chinamen's Wall") are associated with late nineteenth century company hydraulic sluicing on the Buckland.

**Buffalo Creek:** To the south-east of Myrtleford, and in the northernmost area of the Park, a number of quartz mines were worked, from the 1860's to the 1930's. This field extended into the watershed of Back Creek. The largest workings, the Mountain View/Valentine, reached 165ft (over 50m) depth, and produced about 1150 ounces of gold from 1867 to 1908.

**Eurobin Creek:** At least one small quartz mine is known to exist in the Park in this watershed, above the site of Manfield's Temperance Hotel, near the Park entrance. No production is recorded.

**Ovens River:** Some small reef gold diggings, to the east of the Ovens River, are known to exist within the Park. One of these, the London, produced about 100 ounces, from 1864 to 1901. Potential exists for locating other small reef workings, in the foothills along the Ovens River frontage of the Park.
MT MURPHY HISTORIC AREA

Mt Murphy contains the only commercial wolfram (tungsten) mine in the study area, although a wolfram deposit is known near Kiandra, NSW. The lode was discovered in about 1890, and prospected thoroughly in 1906. It was worked from 1907 to 1920, and again during the war years of 1942-43. The orebody was accessed by two adits, and plant installed included steam-driven crushers, trommels, jigs and Wilfley table. The mine produced almost 90 tons of concentrate, valued at about £10,000. It is possible that minor alluvial gold workings exist in the headwaters of Buckwong Creek, flowing to the east from Mt Murphy.

Dunn, E J, "Wolfram at Mt Murphy, Buckwong River, County of Benambra", 1906 (from Records of the Geological Survey of Victoria, Vol II, Part 2, pp120-121);

MT WILLS HISTORIC AREA

The Mount Wills field is the most productive in the study area. Recorded production from the major reef gold mines alone is more than 200,000 ounces, with the Maude & Yellow Girl the highest producing mine (over 100,000 ounces to 1952). Mt Wills was also the Victoria's fifth-ranked tinfield, although production was relatively minor. Tin was known in Wombat Creek from 1872, and Mt Wills was opened in the late 1880's as Wombat Creek tinfield. Gold mining began in 1891 after the discovery of gold-bearing quartz reefs.

Mt Wills Tinfield: This field was discovered in the first half of 1888 by a Government-sponsored prospecting party, acting on advice from Assistant Surveyor James Stirling from the Geological Survey of Victoria. This party found and opened a number of tin lodes on the east face of Mount Wills, and within a year, the whole mountainside had been pegged by hastily-floated companies. Substantial recovery plants were installed at the South Mount Wills Company and the Mount Wills Proprietary Company mines. However, the field proved a failure, and by the mid-1890's work had virtually ceased. Some unsuccessful attempts were made to revive tin mining in the early 1900's. Total recorded production from the field was 155 tons of tin concentrate from about 3500 tons of ore, valued at a little over £11,000.

Stirling, J, "Report on the Tin Lodes at Wombat Creek" 1889 (Quarterly Reports, Victorian Department of Mines, March 1889, pp65-67 + plan);
Rosales, H, "Report on Mount Wills as a Gold-Field and Tin-Field Respectively", 1894 (Special Report, Victorian Department of Mines);

Mt Wills Goldfield: The prospecting party that discovered tin on Mt Wills in 1888 also noted several gold-bearing quartz reefs. Reef mining appears to have begun in about 1891, and during the 1890's, work on most of the best-producing reefs was begun. Most reef workings had finished by the end of World War I, but the consistent returns from the Maude & Yellow Girl mine, combined with intermittent yields from smaller mines, ensured that the field remained productive into the 1950's. Machinery sites abound in this goldfield, and have been described in detail in various Technology Reports by Peter Milner (refer Bibliography).

Rosales, H, "Report on Mount Wills as a Gold-Field and Tin-Field Respectively", 1894 (Special Report, Victorian Department of Mines);
Big River: Gold mining has been carried on along the Big River, which rises on the slopes of Mt Bogong. This goldfield is discussed under the Dartmouth Unit, Alpine National Park, in this section.

References under Dartmouth Unit, Alpine National Park.

NAMADGI NATIONAL PARK

No historic mining sites are known in this Park, although there are several vague references to gold prospecting works in creeks within the area. Mining is known adjacent to the Park, in the Brindabella (Goodradigbee River) & Murrumbidgee valleys, near the Cotter Dam, near Queanbeyan, and at a few places within suburban Canberra.

SCABBY RANGE NATURE RESERVE

No mining occurrences are known in this Reserve.

SNOWY RIVER NATIONAL PARK

Mining does not feature strongly in the Snowy River National Park, and there do not appear to be any gold occurrences within its boundaries. However, there are several places where base metal lodes have been worked or prospected.

Mt Deddick Silver Lodes: Silver/lead/copper lodes were first noted in this locality in the early 1870’s, but development did not occur until after the first lease was pegged in 1896. By 1897, a number of companies and syndicates had pegged over 60 sq km of country and started exploratory works on the lodes. Small quantities of ore were raised by several companies, but transport costs were a problem. The boom had collapsed by 1900, although some minor works were undertaken in the early 1900’s. Shafts (up to 20m depth), adits (up to 100m long), pits and trenches were put in on the lodes. While various despatches of ore are referred to, the only production recorded was 20 tons of lead ore valued at £100, in 1898.

"Mt Deddick Silver-Lead Field", Australian Mining Standard, 1897, p2427.


Accommodation Creek: A copper lode at this locality, just inside the Park boundary, was probably discovered in 1899, although some sources indicate it was known in the 1870’s. Little mining had been done before 1906, but in 1913 it was referred to as the "old Mount Bowen copper mine". Two adits had penetrated the lode, and minor production was recorded, in 1929. Mining on a regular basis did not begin until 1959, when the mine was acquired by the Victorian Mining & Smelting Co. The mine was operated on a larger scale in 1969-70 by Gippsland Minerals NL, but closed in 1971 due to low-grade ore and falling copper prices. Production is unknown. Workings include one main adit with internal shaft, three prospecting adits, and a small open cut. Depth of deepest workings are 100 feet (30.5m).
Snowy River Base Metals: A few small base metal deposits have been opened along the Snowy River valley. Those within the boundaries of the Park are, from north to south, a minor lead deposit near the junction of Betts Creek, minor base metals at New Guinea, and copper at Hall's Peninsula. Several others are just outside the Park boundaries.

In terms of the time and budget constraints of the project, it has been necessary to impose an arbitrary definition to "known historic mining sites". This is because of the enormous volume of published and unpublished material on mines and diggings of the Australian Alps, and the variable quality of the description of historic mining sites.

**Historic mining sites:**
Places that are known to have experienced mining in the past do not necessarily become historic mining sites - ie their features may have been obliterated by river or gully flooding, minesite rehabilitation, erosion or landslip, road construction, dam construction, urban or other development etc. **In general, mining sites must retain an identifiable proportion of the fabric of their operation to qualify as historic mining sites.**

No arbitrary age limit is imposed on the definition of "historic". Mining in all parts of the study area except the Victorian historic areas represents a cultural process that is no longer active, and therefore confined to a single historic period.

**Known:**
It is probable that nearly all historic mining sites in the Australian Alps National Parks are "known". They may be known to surrounding or former landholders, local residents, bushwalkers, local historians, Parks Victoria or NPWS staff, cross-country skiers, road maintenance crews, cattlemen etc. References to historic mining sites in recent published materials, including published oral histories, are abundant - an old battery up this gully, a mullock dump on the side of that hill, Dick's workings in the gorge etc.

Sieving known historic mining sites to this level is not feasible within the constraints of this project, and inclusion of some sites at this level based simply on materials that may be at hand is not a rigorous-enough process. **Therefore, to qualify as known historic mining sites, an arbitrary definition has been applied - the site must have been:**

- Visited, described and included in a relatively recent, authoritative heritage study, per section 2.1.1; or
- Interpreted by the relevant park management body (eg on-site or pamphlet-type interpretation);
- Included in relevant Park or reserve Management Plans.

The authoritative studies used are:

- Victorian Goldfields Project -  
  "Historic Gold Mining Sites in the North East Region of Victoria, Report on Cultural Heritage & Site Gazetteer", D Bannear, 1999 (DNRE);  
  "Historic Gold Mining Sites in the Gippsland Mining District, Report on Cultural Heritage & Site Gazetteer", D Bannear, 1998 (DNRE);  
  Unpublished state-wide database of visited sites, D Bannear (undated).

- Regional Forest Agreements (RFA): related cultural heritage reports (described sites only):
"Thematic Forest History and Heritage Assessment (non-indigenous), Southern CRA Region", 1999.

- Other studies:
  "A Report on the Mining History & Remains in the Northern Half of the Kosciusko National Park", M Pearson, 1979 (NPWS);

C. SITES

Based on the above definitions, the known historic mining sites in the Australian Alps are included in the table below. Details of the sites are included in the MS Excel database separately attached to this report.

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<tr>
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</table>

NP = National Park, HA = Historic Area, BU = Bogong Unit, DU = Dartmouth Unit, W-MU = Wonnangatta-Moroka Unit.

A large number of small and large reef workings at Greens Creek & Dart River have been recorded by Peter Milner (Engineering Department, University of Melbourne), and these sites have been listed in the Management Plan for the Dartmouth Unit of the Alpine NP (1992). A large number of machinery sites at Mt Wills Historic Area & adjoining Dartmouth Unit were included in his National Trust study in 1982.

These 'known sites' are listed separately here because they represent the only authoritative, comprehensive surveys (within narrow criteria) undertaken on any gold mining sites in the study area, and inclusion in the main listing would add an unintended bias to the presentation.

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<td>Sperm Whale Mine</td>
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<td>Blair-Hadden/Burnside Ck</td>
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<td>Ajax Reef</td>
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<td>Mitta Mitta Mine</td>
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D. KNOWN MINING LANDSCAPES

The following mining cultural landscapes have been identified within the Alps, in previous studies.
In addition, Jane Lennon in "The International Significance of the Cultural Values of the Australian Alps", 1999 (AALC) refers to the "obvious" cultural landscape zones in the suite of Historic Areas gazetted in Victoria. None of these landscapes have been recorded, described or assessed in detail.

It is acknowledged that mining cultural landscapes exist at a number of different levels within the Australian Alps National Parks:

- **Site level:** Within any complex mining site, the spatial distribution of features will produce a landscape, and viewing of the relationship between the various features in the landscape will enhance understanding of the site. The site's environmental setting will become part of this landscape. In general, other cultural influences will not be visible at this level.

- **Integrated site level:** Viewpoints may be available that incorporate a series of mining sites, related features or connections into a cultural landscape, that interprets the historic mining activities and their impact beyond the level of individual sites. The environmental setting again will become part of this landscape. Other cultural influences are likely to be visible at this level.

- **Broad (district or regional) level:** This is the broad pattern of settlement and development of the Australian Alps, relating to the wider influences of historical mining and prospecting in the region. It includes road and track systems, gold-based or influenced townships, development of logging or farming areas to supply mining populations etc. At this level, the mining landscape is integrated into a variety of other cultural and natural landscapes, that together tell the story of human influence in a district or region.

For the purposes of this project, identification and assessment of mining cultural landscapes has been done at the integrated site level. The reasons for this are based in practical considerations relating to landscape management.

- At a site level, the 'landscapes' developed are specific to that particular historic operation and its context, and management of the landscape is effectively site management.

- At the broadest level, cultural landscapes are evolutionary, and demonstrate the sum of cultural influences leading to the present aspect. Any attempt to conserve or manage landscapes at this level would require sterilising of future cultural influences. While it could be argued that the establishment of National Parks has legislated management of future cultural influences, landscapes at this level extend beyond the boundaries of the parks, into adjoining towns, farmlands, services etc.

Guidelines for identifying, assessing and managing cultural landscapes in the Australian Alps national parks have been prepared by Jane Lennon & Steve Matthews (Jane Lennon & Associates) in their "Cultural Landscape Management" report, March 1996.
E. POTENTIAL HISTORIC MINING SITES

DEFINITION

Potential historic mining sites are those places where mining is known to have been carried out in the past, or sites where evidence of mining has been noted, but not authoritatively recorded. Where individual sites cannot be identified, generic entries are made, identifying broad types of mining and defining localities rather than sites. All of these places are listed in the attached databases, along with "known" historic mining sites. All of these places have potential to impact on cultural heritage management within the Alps National Parks, and attached Historic Areas. The purpose of the databases is to provide a reference source to assist in management decisions.

ASSESSMENT OF DATA USED FOR ATTACHED DATABASES

Limitations:

To identify all individual mining sites at a claim or lease level throughout the Australian Alps would be a task well beyond the present project, in time and budget terms. It would also not necessarily contribute significantly to the broader heritage strategies developed in this project.

Consistency:

A decision had to be made early in the project regarding adoption of models that would provide some sort of consistency for inclusion of sites in the databases. This consistency would translate as the number of site entries for each mining field/management area being roughly proportional to the level of mining activity in that mining field/management area.

However, it quickly became apparent that functional models could not be developed. In reviewing available literature on mining heritage in the study area, and undertaking additional historic research as required, some areas were found to be well represented at the individual site level, and others not. In historical literature, this can relate to:

- The mining field's economic importance (with abundant records available);
- The historic period in which the mining was undertaken (eg, in the early ‘rush’ period, few individual sites are recorded);
- The authorship (some Mines Inspectors and Geological Survey personnel tended to produce more detailed reports than others);
- The mining that was carried out being of limited extent and duration, where a single contemporary report may identify all sites;
- The type of mining carried out (see below).

In recent reports, this can relate to:

- Its accessibility (often visited, and therefore locally-known);
- The interest shown by local historians (volume of published historical material).

In general, the individual sites identified for alluvial mining are very low in proportion to the activity undertaken. This relates to the nature of the mining, where small claims are rapidly worked out in succession by individuals or small parties, and the level of recording at the time is not sufficient to identify historic sites. For instance, at their peak, the Toolong diggings in Kosciusko NP had 250 miners, but few individual sites are identified in historical literature.
With mining of primary orebodies (quartz reefs, base metal lodes), the activity may require leases, be capitalised for installation of machinery, employ labour, and extend over a longer period of operation. Therefore individual sites are far more likely to be recorded.

**Levels of sieving:**

This project is limited in time and budget, and levels of research have had to be established to conform to these. No research at an archival level has been undertaken to identify mining sites, nor has any attempt been made to access local newspaper records. In general, research has been limited to:

- Available secondary sources (published reports & books, research & heritage studies, and web-based sources);
- Non-archived historical records of the relevant Mines Departments and Geological Surveys.

Neither has been fully explored, because of the huge volume of material available, although search of the latter has been reasonably comprehensive. Complete exploration of non-archived Departmental records would still not produce consistency because of the extreme variability in the content of the reports themselves.

Given that no real level of consistency can be produced, *any sites derived from archival or newspaper level records that have come to hand have been included*. For instance, a considerable volume of records was provided to the project by Dr Ruth Lawrence, Latrobe University, Bendigo, and this included some tabulated archival material relating to mining leases in the Bogong Unit of the Alpine NP. This has been included.

**Summary:**

The databases are in no way be a complete representation of mining in the Alps - they are simply a compilation of *all records that have come to hand*, and levels of research are not identified. They should be considered *works-in-progress*, and are designed to be added to according to the need and interest of the relevant land managers.

**FORMAT**

The MS Excel spreadsheet format, rather than a more complex relational database, has been chosen, for its simplicity and widespread use. The information contained is very basic, but adequate to identify the site/area. Attached site gazetteers & sample Heritage Action Plans elaborate on some of the more significant and strategically-important places.
APPENDIX 9

ANALYSIS OF MINING IN THE ALPS

A. PHASES OF MINING p 205
B. MINING CULTURAL LANDSCAPES - AUSTRALIA 207
C. AUSTRALIAN ALPS MINING INFRASTRUCTURE 207
D. ALPS MINING ADAPTATIONS 212
E. TYPES OF MINING 216
F. REGIONAL CHARACTERISTICS - NEW SOUTH WALES 222
G. REGIONAL CHARACTERISTICS - VICTORIA 223
APPENDIX 9 – ANALYSIS OF MINING IN THE ALPS

A. PHases of MINING

GOLD

The development of many goldfields around Australia can be broken down into very distinct phases. These phases characterised mining on the fields at a particular period. They may relate to:

- The nature of the early goldrushes, composed of individual miners or small groups with little capital, and the nature of the discovered deposits - eg rich superficial deposits (shallow alluvial) suiting individual miners or small groups;
- Working of primary deposits (reefs) & the formation of small companies, after depletion of superficial secondary deposits;
- Large company formation to provide capital for deep working of primary deposits;
- Mining peaks & troughs relating to general Australian or world economic conditions (eg British investment in the depression of the 1890's, government-stimulated prospecting in the 1890's, gold mining resurgence with price rise in the Great Depression of the 1930's, etc);
- Production resurgence through the development of new technologies (eg large-scale hydraulic sluicing methods developed in late 1800's, bucket dredging from 1900, cyanidation from mid-1890's, etc).

Within the study area, phases at a goldfield level are generally poorly developed. Some major goldfields underwent transition from predominantly alluvial to predominantly reef production (eg Upper Dargo, East Branch of the Ovens, Grant/Crooked River). Others did not.

Kiandra was an alluvial field, but in the absence of commercial primary deposits, it did not make the transition. About 40% of its recorded production came in its first year, almost 50% in its first two years, and over 60% in its first four years. The rest of the production came over a long period, at a low annual rate. Minor peaks came in the 1880's, with provision of water supplies for hydraulic sluicing, and the early 1900's, with the operation of the dredge. While various "phases" have been assigned to mining at Kiandra, the reality is that there are only two phases. These were its brief, bright flare as a rich alluvial/deep lead goldfield (1860's), followed by an extended period of subsistence-type mining, interspersed with predominantly unsuccessful small entrepreneurial ventures based in new technologies, mixed with faith, hope, and small amounts of venture capital.

Mt Wills, on the other hand, was never an alluvial field - while the products of its rich reefs were mined in surrounding goldfields, its reefs were opened serendipitously as a result of tin-mining & prospecting. Never an individual miner's field, it was capitalised from the start, and the peaks and troughs of production were more related to the vagaries of the orebodies and the quality of management than outside influences. Like most long-lived fields, it was eventually strangled by diminishing returns (exhaustion of resources) and the languishing post-World War II gold prices.

The Grant/Crooked River fields made the transition to the quartz mining phase, but their mines (with the exception of the Good Hope) generally saw their beginnings and ends in the 1860-1870's, missing the later influences that would change the nature of other goldfields. Dart River & Greens Creek followed a similar pattern in the general poorness of the reefs, and metallurgical problems related to the ores were not overcome.
In the East Branch of the Ovens River, early alluvial mining was followed by quartz mining, and the formation of small mining companies. In the late 1800's, several well-financed hydraulic sluicing companies were formed, successfully working river terraces and high-level stranded leads. In the 1890's, tracks cut by the Victorian Department of Mines resulted in a number of reef discoveries and new mining operations. Dredging was introduced at the start of the 1900's, and in the first half of the century, several new quartz mines were opened with Melbourne capital. Alluvial works, and some further interest in reef mining, were stimulated during the 1930's, with the rise in gold price. While it would be easy to assign these developments as "phases", none of these changes characterised or dominated gold mining within the valley at the particular period. After the initial alluvial mining phase (river workings & ground sluicing), this area was always diverse in its types of mining. Phases of mining were much more clearly defined in the Upper Ovens Goldfield as a whole (alluvial/quartz/hydraulic sluicing/English capital/bucket dredging).

TIN

Within the study area, there are two tinfields, at Mt Pilot in Kosciusko National Park, and at Mt Wills, in Mt Wills Historic Area.

At Mt Pilot, the early history is poorly recorded. Tin was found here in 1875, when 10-pounds of stream tin was recovered from washdirt at the foot of the mountain. The next mention was 1892, when it was stated that a good deal of stream (alluvial) tin had been obtained, and numerous shafts had been sunk on a stanniferous quartz vein. In 1936, a company was formed to work the area, but closed in 1938 after recovering 1.2 tons of concentrates. Phases cannot be assigned on the basis of the historical record, and the later, unsuccessful operations of one company cannot be considered a phase. The field appears to have been predominantly alluvial.

At Mt Wills, stream tin had been noticed in gold workings on Wombat Creek, but not in sufficient quantity to warrant systematic mining. The tin lodes were found in the late 1880's, after advice given to the Omeo prospecting party. Numerous lodes were uncovered, and the area was quickly pegged out by a large number of hastily-floated tin mining companies. By 1893, some of the larger, well-financed mines had installed stamp batteries (up to 24-head) and sophisticated gravity recovery systems (jigs, concentrating tables etc). But the lodes did not produce to expectation, and low tin prices saw the field die by the mid 1890's. Unsuccessful attempts were made to revive the field in 1906-7, and 1913-14. Total recorded production was 155 tons of tin concentrate, valued at about £11,000. The field was exclusively company-mined and based on primary deposits. No phases are indicated. It is interesting, though coincidental, that all commercial tin-mining in the study area peaked around the 1890 mark.

BASE METALS

Base metals mining in the study area, except for the Lobb's Hole/Yarrangobilly district in the Kosciusko National Park, was characterised by a large number of isolated deposits, very few of which were developed to the stage of commercial production. The Lobb's Hole/Yarrangobilly copper mines achieved peak production in the early 1900's, but their yields were very minor in State terms.

SUMMARY

Evidence for broad phases of mining within the study area is poorly developed, except for the transition from alluvial gold mining to reef mining in several Victorian goldfields. However, introduction of technologies such as large-scale hydraulic sluicing, cyanidation and bucket dredging into various goldfields within the study area are reflective of phases of mining that are well-developed in surrounding major goldfields.
Australia has proven rich in mineral resources, and the exploitation of its mineral wealth has left a legacy of mining landscapes throughout the nation. Probably nowhere in Australia exists a more identifiable and complex mining cultural landscape than that of the central Victorian goldfields. This is because of its massive early impact on what was a sparsely-settled area, and the natural advantages of the climate, soils and proximity to ports that enabled the area to thrive after mining.

Deposits of gold have pre-determined all the broad features of the region that are visible today. These deposits have influenced the distribution, size, and shape of the towns and cities, the location and pattern of farming lands, the development of government infrastructure (including roads, railways, buildings, utilities etc), and the distribution of remnant native forest.

The richness and nature of the gold shows in the towns - Bendigo's opulent buildings speak of immense amounts of gold, but gold locked deep in quartz reefs which required large capitalisation for mining and recovery, making wealthy investors even richer. Ballarat's less grand but equally impressive buildings also speak of immense amounts of gold, but gold that was cheaper to mine and recover from the great deep leads, leading to mining by cooperative parties and a more even distribution of wealth.

The remnant box-ironbark forests of the goldfields are very much a cultural rather than a natural feature. They were often protected by law from agricultural or other development because of their proven gold-bearing nature or potential, and their value in providing timber for the mines and their engines, and for the gold towns that serviced them.

C. AUSTRALIAN ALPS MINING INFRASTRUCTURE

DEFINITION

In general, mining heritage outside of actual mining sites or areas has been assigned the generic term "mining infrastructure", and this is discussed under several headings, below. An infrastructure database is attached to this report.

ROADS & TRACKS

Mining tracks are numerous within the study area, and range from trails that were blazed in early mining exploration, to government-constructed tracks that were cut to provide access to mining fields, or to stimulate prospecting in remote areas.

The AALC has 95 mining tracks listed in a database, but this has not been accessed in this project. The main track types are:

- Explorer's tracks blazed through wilderness, and afterwards used to access discoveries - eg McMillan's track from Monaro to Port Albert, Gippsland, via Omeo, in 1839;
- Existing Aboriginal pathways or pastoral tracks that were improved for access new mineral discoveries - eg the track over Mt Hotham, via Bon Accord Spur to Harrietville, blazed by stockmen in 1851 (?) and subsequently developed by

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miners. These stockmen, Brown & Wells, are said to have blazed a number of trails, often with Aboriginal assistance. Road now largely re-aligned, with Bon Accord section a well-used walking track within the Alpine NP27;

- New, unsponsored tracks that were cut to provide access to new discoveries - eg early access tracks cut along rivers at Crooked River and Upper Dargo goldfields in the early 1860's. Upper Dargo roads now derelict, but some Crooked River tracks are maintained;

- Mines Department or other governmental tracks cut to provide access to existing mining fields - eg south-easterly road access to Kiandra, via Denison (Russell's), cut by the NSW government in 1860. Track now largely re-aligned, as part of Snowy Mountains Highway28;

- Mines Department tracks cut to promote prospecting in remote areas - eg Harrington's Track, cut in the 1890's to provide access to the remote upper Murray region29;

- Mines Department tracks cut to link existing goldfields - eg Tawonga to Mt Wills (Track 63)30. Now road along Big River, with some re-alignment.

- Tracks cut by operators to provide access to individual mines - eg side-cut from Machinery Spur to the Red Robin Mine, cut by Bill Spargo in the 1940's. Now used as Alpine NP management road and walking track;

- Tracks cut by miners to link separate sections of individual mines (adit levels, machinery sites etc) - eg 5km side-cut from Red Robin Mine to battery, cut by K & C Harris in the early 1960's. Now used as Alpine NP management road and walking track.

As indicated above, some mining tracks are now incorporated into major and minor roads, walking tracks etc. Many more are disused and overgrown, but because of the predominantly mountainous terrain, most important tracks had to be side-cut for at least part of their courses, and are easily recognised in the field.

Information on tracks can come from a variety of historical sources. The early roads into Kiandra in the Kosciusko NP were well-mapped by the Surveyor-General of South Australia in July 1860. De Gruchy & Leigh of Melbourne produced a map. The NSW government also variously recorded the tracks to and between the early Kiandra diggings. In Victoria, the extensive network of mining tracks cut by the Department of Mines are numbered and well-recorded on published maps of the eastern portion of the colony.

Tracks blazed to early diggings are often described in journals and diaries in relation to landscape features, and precise identification can be difficult. Some of these trails became defined by continued and heavy use, and with some modifications, are still in use today.

TOWNS & SETTLEMENTS

General

Within the study area, numerous mining towns developed in the vicinity of mining fields. Most of these are associated with the goldfields in the Victorian section of the study area, although Kiandra in NSW was easily the largest and longest-lived. In addition, a small copper-mining settlement of

30 "Track No 63 - Glen Wills to Tawonga" (map), 1901, Victorian Department of Mines.
Ravine at Lobb's Hole was the only mining township not principally based on or sustained by gold. Large numbers of Chinese miners worked in the Victorian mountain goldfields, and it is likely that substantial camps existed along the rivers. The only recorded substantial Chinese camp in the study area was at Kiandra.

In both the Victorian & New South Wales sections, all former mining towns exist essentially as archaeological sites, with little above-ground fabric remaining to tell of their former occupation. The reasons for this are twofold:

- Many former settlements were situated in remote, rugged bushland, and after mining ceased, there was no other industry to promote the survival of the towns, and they died. Typical examples are the gold towns of the Upper Dargo goldfield, the Crooked River, and the Dartmouth area;

- Those towns that (by virtue of extended mining operations and development/servicing of other industries) survived to the present day consist of freehold land, and hence are not included in the chain of National Parks.

The latter point highlights a weakness in assessing mining cultural heritage on a parks-basis. By the very nature of national parks, only failed mining towns can be included in this study. For example, Harrietville, a successful mining settlement based partly on resources contained within the Alpine National Park, remains as an area of private & commercial freehold land outside the boundary.

While actual diggings may lie within the parks system, their significance may extend to areas outside the parks system, in the gold towns that grew on the wealth provided by those diggings and survived, in the industries that developed, and in the broader cultural landscapes.

Only one part of the story may told within the parks, and in Australia there are no integrated cultural heritage management systems developed that encompass the wide range of management authorities involved. In the United States, for example, integrated cultural heritage management is available. (refer Appendix 10, Global Context, for the Klondike Gold Rush National Historic Park).

The Gold Towns

Within the study area, the largest former gold town was in the Kosciusko National Park at Kiandra, which for a brief time in 1860 would have held the majority of the estimated 10,000 people who rushed the field. Kiandra had 13 hotels, over 50 stores, a courthouse, police station, school, church, post office and cemetery. It also had a Chinese camp. The population rapidly declined to a few hundred, and the town managed to survive with very small numbers beyond 1950\(^{31}\). Most of the derelict buildings were removed by the NSW National Parks & Wildlife Service in 1979.

Other large former gold towns in the study area include the Nine Mile near Kiandra, the Mt Wills mining towns, and Grant in the Grant Historic Area.

The Nine Mile population peaked at about 600 in 1860, when it had 4 hotels, a number of stores and a post office. Other larger towns of the period associated with the Kiandra rush were Denison (Russell's) and West Denison, on the Eucumbene River. Population figures are not available, but each had four hotels and a number of stores\(^ {32}\). It has not been established at the stage whether the sites of Denison & West Denison are within the Park, or submerged under Lake Eucumbene.

Grant was established in 1864 following the discovery of a large number of gold-bearing quartz reefs, but rapidly declined as the reefs proved generally disappointing. Peak population was about 500, in


the mid-late 1860's. However, the town that had once had fifteen hotels, four banks, a church, school, police station & courthouse, newspaper office & newspaper, stores and professional offices was reduced to a population of 112 by 1874, and to six families by 1902. The last residents departed in 1916.

At Mt Wills, three main townships developed out of the tin and gold discoveries. Sunnyside was the first, in the late 1880's, initially to service the tin mines, and immediately afterwards for the rich gold bearing reefs that were opened up. Its peak population was around 500, but had fallen to 300 by 1893. It had hotels, stores, post office, school, church and cemetery, but was virtually abandoned by 1919.

The second, Glen Wills, began in about 1889, and at its peak it had about 500 people, with hotels, stores, school, police station, bakers and a cordial manufacturer. It was abandoned by 1959. The third, Glen Valley, developed in the 1890's on the back of further rich gold finds, and was known as 'Big River' or part of Glen Wills township in its early years. Smaller than the other two towns, its peak population was over 100, and it was sustained into the 1970's by local farming families.

The Crooked River gold towns (Pioneer Flat, Bulltown, Stonewall, Hogtown, Winchester, Ramtown) that developed from 1861 had populations of up to 300 people, and included hotels, post offices and stores. However, the towns were virtually deserted by 1870. Only one, Talbotville, survived into the 1900's33.

The gold towns (Louisville, Brockett & Mayford) of the Upper Dargo River in the Alpine NP came into being from 1863-4 onwards. The largest, Louisville, had a peak population of a few hundred, and included a post office, stores and hotel. The town was virtually deserted by 1880. Several small settlements developed around some larger mines, including the Evening Star and Conness Reef, and these included stores & restaurants. It is probable that Chinese camps existed on the river. A small, short-lived mining supply town developed at Verdun, on the Dargo High Plains Road34.

At Brandy Creek near Mt Hotham, a small settlement developed in association with the extensive sluicing workings of the 1880's. There were two stores, a hotel and a boarding house, as well as private dwellings.

In the Dartmouth Unit of the Alpine National Park, some mining towns and camps existed, with probably the largest township being Wombat, on Wombat Creek. This began in about 1861, and had a hotel, stores, post office and cemetery. Its peak population was under 500 people, and it was abandoned by 1900. Other towns and camps were on the Dart River. Within the Park are Glen Dart ('Williamstown') and Canvastown. Glen Dart had a hotel by 1883, and stores, a local court, post office, school and cemetery were established. Peak population was over 100 people, but when the town was finally surveyed in 1895, there were only eight dilapidated buildings. Canvastown began in the late 1880's, after the discovery of quartz reefs in the vicinity. With the population peaking at over 100, it had a hotel, stores, school and post office. The township had declined by 190035. On the Gibbo River, stores were located at several places along the diggings, and it is likely that Chinese camps existed. A small settlement called Gibbo developed at King's flat, from about 1859. Most of this flat is freehold land, but the settlement may have some expression within the surrounding Park.

In NSW, many of the alluvial gold diggings had generally short-lived mining camps within or adjacent to the workings, but the number of miners was usually small and serviced townships do not appear to have been surveyed or established. Yorkies settlement near Rules Point is an example. It is assumed that some early diggings on the Crackenback goldfield were serviced at least with postal delivery, as reference is made to delivery of mails from Kiandra in the 1860's36.

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The township of Ravine, at Lobb's Hole in the Kosciusko NP, supported a hotel, stores, boarding houses, post office, school and police station. Shanties had been operating on the Kiandra road at Lobb's Hole in 1860. A substantial hotel was built in about 1874, the first year of copper production, and also served travellers on the Kiandra-Tumut road. The township thrived during the peak period of operation of the mines, in the early 1900's, but had declined dramatically by 1920. A peak population of about 500 people is ascribed\textsuperscript{37}. However, this may be a considerable overstatement, based on the level of mining activity and employment opportunities.

**HUTS**

Large numbers of huts have been listed in reports and databases of the various management agencies of the Alps national parks.

In the Victorian section, 112 standing huts were studied as part of the *Victorian Alpine Huts Heritage Survey* (G Butler & Associates, 1996). Only 9 had mining associations, and five of these were in use at the Red Robin Mine. Two of the remaining four were rebuilt, with secondary associations. Ruth Lawrence, in an article "Huts of the Bogong High Plains", 1993\textsuperscript{38}, identified 38 mining huts that had existed in that area, only 5 of which were extant.

In the NSW section, no huts with mining associations are known outside Kosciusko NP. Within Kosciusko NP, 239 huts have been recorded by the *Kosciusko Huts Association*\textsuperscript{39}. Only a small percentage of them have mining associations, and some of these have multiple associations. Of 136 hut & former hut sites listed in Klaus Hueneke's *"Huts of the High Country"* (1983), 12 have mining associations. Only four of these are standing.

Standing huts with mining associations that have been listed by Butler & Hueneke, and in the Kosciusko NP Plan of Management (1982), are:

<table>
<thead>
<tr>
<th>NAME</th>
<th>MANAGEMENT UNIT</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biplane Mine Hut (rebuilt)</td>
<td>Bogong Unit, Alpine NP</td>
<td>Butler, 1996</td>
</tr>
<tr>
<td>Broken Dam</td>
<td>Kosciusko NP</td>
<td>Man Plan, 1982</td>
</tr>
<tr>
<td>Four Mile Hut</td>
<td>Kosciusko NP</td>
<td>Hueneke, 1983</td>
</tr>
<tr>
<td>Grey Mare Hut</td>
<td>Kosciusko NP</td>
<td>Hueneke, 1983</td>
</tr>
<tr>
<td>Pig Gully Hut</td>
<td>Kosciusko NP</td>
<td>Hueneke, 1983</td>
</tr>
<tr>
<td>Quart Pot Flat Hut (rebuilt)</td>
<td>Dartmouth Unit, Alpine NP</td>
<td>Butler, 1996</td>
</tr>
<tr>
<td>Quintet Mine Huts (2)</td>
<td>Bogong Unit, Alpine NP</td>
<td>Butler, 1996</td>
</tr>
<tr>
<td>Red Robin Battery Huts (3)</td>
<td>Bogong Unit, Alpine NP</td>
<td>Butler, 1996</td>
</tr>
<tr>
<td>Red Robin Mine Huts (2)</td>
<td>Bogong Unit, Alpine NP</td>
<td>Butler, 1996</td>
</tr>
<tr>
<td>Tin Hut</td>
<td>Kosciusko NP</td>
<td>Man Plan, 1982</td>
</tr>
<tr>
<td>Tin Mine (Carters Hut)</td>
<td>Kosciusko NP</td>
<td>Hueneke, 1983</td>
</tr>
<tr>
<td>Tin Mine Barn</td>
<td>Kosciusko NP</td>
<td>Man Plan, 1982</td>
</tr>
<tr>
<td>Yans Store</td>
<td>Kosciusko NP</td>
<td>Man Plan, 1982</td>
</tr>
</tbody>
</table>

In general, huts that may have been erected originally as prospecting or mining bases (rather than being associated with a particular mine) will be considered as 'infrastructure'. The Four Mile Hut (Hughes) in the Kosciusko NP would be an example. Huts that are part of the fabric of individual historic mining sites will be considered as such in this project. For example, this applies to huts at the Tin Mine in Kosciusko NP and at the Quintet mine in the Alpine NP.

\textsuperscript{37} "Thematic Forest History & Heritage Assessment (Non-indigenous), Southern CRA Region", NPWS, 1999, Appendix 1, Site No 10: "Ravine Hotel Ruin".
\textsuperscript{38} Published in "Voice of the Mountains", No 16, 1993.
\textsuperscript{39} Quoted p8, Lennon, 1999.
It should be noted that benched hut sites and stone fireplaces are very common features associated with quartz mines in mountain goldfields. In alluvial diggings in the same areas, the miners had to be housed, and huts were built along the length of the diggings. In terms of this Alps-wide study, it is clear that there would be many thousands of mining-associated hut sites in the study area, commensurate with the numbers of miners who worked in these areas over a period of more than a hundred years.

It can be seen that the 41 former mining hut sites listed by Lawrence and Hueneke may be less than 1% of the actual number of sites on which mining huts were built, within the study area. For practical reasons, there has been no attempt made to document these hut sites, other than where they form part of the historic fabric of mining sites of particular interest.

OTHER

Numerous other developments were undertaken to assist mining in the study area, and are part of the mining heritage of the Alps. These included early hotels, stores and waystations (‘hospices’) along the tracks between mining fields. These were particularly important in the high country, in providing safe refuge in winter conditions.

Outside the Kosciusko NP, a number of police camps were set up by an anxious government in mid-1860 along the roads leading to the Kiandra diggings, to ensure the orderly passage of the expected rush of diggers later in the year. These camps included stables, lock-ups and slab huts.40.

On the Victorian side, nineteenth-century government-sponsored prospecting parties featured strongly in the mountainous areas, where camps were set up as bases for exploration of the local areas. A large number of these campsites (recorded on maps published by the Geological Survey of Victoria) are within the study area, but are unlikely to have left lasting or recognisable heritage features.

Races cut to bring water to mines and diggings (for sluicing, crushing and power generation) are common in the study area, and are largely considered to be mining attributes of the relevant mines or diggings, rather than separate ‘infrastructure’. The attached Mining Infrastructure database also includes any lone graves related to mines or mining, that have been noted during the research phase of this project.

D. ALPS MINING ADAPTATIONS

INTRODUCTION:

Throughout the world, the mining of mineral deposits in freezing conditions required adaptations to mining methods. The problems to be overcome included frozen ground (permafrost), unavailability of water during winter due to freezing, and low efficiency of certain recovery processes in very low temperatures. Added to this were the difficulties of maintaining supply routes over winter, flooding during spring snow melts, availability of timber for mining purposes, and the general hardships of working and living in a hostile environment.

THAWING:

Frozen gravels were a major problem in the Yukon, straddling Alaska and Canada. The early diggers in the Klondike rush in Canada built huge fires over the gravel beds to thaw them. Shallow sinking
involved lighting fires or placing hot rocks at the shaft bottoms, to successively thaw the layers of dirt
and gravel\textsuperscript{41}.

Very quickly, an alternative method was developed, using steam delivered to spear points, which were
driven into the frozen ground. The steam was generated in boilers - major holdings or companies may
have had several large boilers installed. Other companies would supply steam to a number of small
claimholders. Small portable steam-generators were developed, light enough to be carried by one or
two men. For bucket dredging, arrangements of typically 150 or more spear points would be used to
effect thawing and excavation of the gold-bearing drift\textsuperscript{42}.

Even these methods were further adapted, using hot water and cold water circulation, both of which
showed efficiencies. Hot water thawing used large pumps - the pump exhaust was discharged into the
suction pump, maintaining the temperature of the recycling water that was circulated through pipes at
moderate pressure. Another method with limited use involved spreading quicklime over frozen
topsoil, slaking it with water, applying a blanket of sawdust over the surface and allowing the heat
generated to thaw the ground\textsuperscript{43}.

**UNAVAILABILITY OF WATER IN WINTER:**

Freezing winter conditions at high altitudes/latitudes often meant that flowing water would be
unavailable for processing for long periods. Mining of alluvial deposits in these conditions was
adapted.

Sometimes, mining would continue over winter, with the product stockpiled awaiting the spring thaw.
In the Alaska goldfields, the normal dump-box at the shaft-head would be replaced in winter by a
sluice box. This was protected by a strong cribwork of timber, and lagged over. The gravel raised
from the mine was dumped in a conical mound over the sluice box, and with the spring thaw, much of
the winter dump could be fed into the sluice by gravity\textsuperscript{44}.

Some mines would split their operation, mining only in winter, and processing only in summer.
Where the ground was frozen in winter, thawing was done during the night shift, and mining during
the day shift. Other mines would operate in summer only\textsuperscript{45}.

Some mines adapted their power supplies. In Colorado, USA, one large base-metal mine at high
altitude used water-power in summer (supplied by an overshot waterwheel) and steam-power in
winter\textsuperscript{46}.

**RECOVERY PROCESSES:**

Amalgamation (the use of mercury to recover gold) may be influenced by temperature, although
historically opinion was divided. At low temperatures, mercury becomes thicker, and heating of
water used in processing by plate amalgamation has been tried in high altitude quartz mining, to
overcome perceived loss of efficiency.

For instance during the 1890's, the use of heated water for amalgamation was widely used in South
Dakota, USA, in winter. However at the same period in Colorado, with mines at altitudes in excess of
3000m, it was not generally used. Millmen here felt that the higher viscosity was an advantage, with
less mercury loss. In the highlands of Otago, New Zealand, mercury itself was not generally used at
this period because it was felt to be ineffective in cold conditions\textsuperscript{47}.

\textsuperscript{42} “Mining Engineers' Handbook”, R Peele, 2nd Ed, 1927, p 958, 959.
\textsuperscript{43} “Mining Engineers' Handbook”, R Peele, 2nd Ed, 1927, p 122, 959.
\textsuperscript{44} “Mining Engineers' Handbook”, R Peele, 2nd Ed, 1927, p 953.
\textsuperscript{45} “Mining Engineers' Handbook”, R Peele, 2nd Ed, 1927, p 954.
\textsuperscript{47} “Stamp Milling of Gold Ores”, T A Rickard, 1897, pp 92, 125, 126.
Only one example of water-heating to assist plate amalgamation is known in Australia, at the Red Robin Mine.

**TOPOGRAPHIC ADAPTATIONS:**

Various adaptations relating to topography have been advanced as characteristics of Alpine mining. These include the use of Pelton wheel power plants, large-scale hydraulic sluicing etc. and are based on availability of water at high heads. Certainly these technologies are visible at sub-alpine levels in the Australian Alps, but their use extends to any areas with the minimum required hydraulic heads and available water volumes. Indeed, in flat-lying areas, extensive hydraulic sluicing has been carried out using pumps to deliver the water to the monitors (water cannons).

Similarly, the use of adits (horizontal tunnels) rather than shafts, and the construction of inclined tramways and flying foxes, are signatures more generally of hilly or mountainous terrain, rather than the Alps themselves.

However, it could be said that all of the above adaptations serve to distinguish lowland mining from upland mining, of which Alpine mining is a part.

**4.6 ARCHITECTURE:**

Mine buildings can reflect the Alpine conditions, with high gables or heavily-reinforced roof framing to survive the winter snows. In huts, development of substantial fireplaces for heating purposes could be expected, as well as modifications such as above-drift entries, insulation etc.

Some specialised adaptations (removable guttering, split doorways etc) at Kiandra were noted by Gregors (1979), who also noted that most huts and buildings in the alpine areas were no different from those at lower elevations.⁴⁸

**4.7 OTHER:**

Many other minor adaptations to high altitude/latitude mining were made. Elaborate insulation in connection with steam engines or steam delivery was commonplace. For instance, lines delivering steam to thawing-spears at dredging operations in Alaska were asbestos-covered and cased in wooden boxes packed with sawdust.⁵⁰

Even in relatively mild Alpine conditions, bursting of frozen water pipes could be a problem. Pipes were often heavily lagged with asbestos or hessian. Water taps could be kept running to avoid freezing of water lines, and delivery pipes buried in the ground. Iceing-up of machinery and equipment was a constant hazard, and required special attention and modifications.

Some mines employed teams of shovellers, to keep tramways clear of snow in winter. Preference for aerial ropeways over inclined tramways has been recorded, to overcome the problem of winter snow drifts, and render working practicable during all seasons. Mining tracks have been positioned on hillsides, below the snowline to provide winter access, and above creeklines to avoid the spring torrents.

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⁵¹ Eg pipe to Pelton wheel at Razorback battery, Bogong Unit, Alpine National Park.
⁵² "Alpine Observer" (Bright, Vic, newspaper), 31/8/1900.
⁵³ "Alpine Observer" (Bright, Vic, newspaper), 28/6/1901.
In modern underground mining in permafrost, special drilling fluids are used to stop freezing of the circulating drill waters, and in winter conditions at high altitude/latitude, engines are run 24-hours a day to prevent freezing. Probably the most bizarre high-altitude adaption occurs in the Andes, South America, where indigenous tin-miners at extreme altitude chew cocoa leaves as a routine, to drug their bodies to withstand the pain of manual labour in the oxygen-deficient air. This has no corollary anywhere else in the world.

ALPINE ADAPTATIONS - AUSTRALIAN CASE STUDY

Only one known historic mining site in the Australian Alps shows a wide range of Alpine adaptations in its fabric. Not surprisingly, it is the Red Robin Mine in the Bogong Unit of the Alpine National Park. This mine retains much of the fabric of its operation from 1941 to the present day, and consists of two sites, the mining site at an altitude of over 1600m, and the battery site (treatment plant) at an altitude of over 1200m. The top site, close to the top of Machinery Spur, experiences deep snow drifts and severe winter conditions. The lower site, in the West Kiewa valley below, experiences regular and heavy snowfalls over winter. The adaptations are summarised in the following boxes:

**Mining Site:**

(i) Spargo’s Red Robin hut anchored to steep hillside with heavy cables, to resist winter snowdrifts;
(ii) A-frame tool shed at No 3 Adit level, equipped with pot-belly stove.

**Battery Site:**

(iii) In-line water heater (vertical boiler) at battery, installed to assist plate amalgamation in over-winter operation;
(iv) Skillion section of roof of battery shed heavily propped with timber to hold weight of winter snows;
(v) Guttering removed from prefabricated buildings;
(vi) Signs in Accommodation Hut advising emptying of vehicle radiators (to avoid freezing), and unavailability of toilet flush-water in winter.

In one sense, the splitting of this operation into two worksites is an Alpine adaptation. While the water supply at the high-altitude mine was insufficient to operate the battery, this could be said to typify mountain goldfields in general. However the lower altitude site enables some stockpiling of ore during the short summer mining season, and extended operation of the battery to (usually) early June each year. This can be interpreted in the fabric, with the stockpile area at the battery site well-defined and roofed-over.

These adaptions are relatively minor, and to the major degree, the Red Robin demonstrates in its fabric the operation of a typical mountain reef mine.

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54 From site inspections for Heritage Feature Surveys, LRGM-Services, November 2000 (Parks Victoria).
E. TYPES OF MINING

INTRODUCTION

Mining of a number of different types, and utilising a number of different technologies, was undertaken within the study area. The following sections outline the types of deposits, the mining methods used, the heritage features generated, and the areas affected.

PRIMARY

(a) Auriferous (gold-bearing) reefs:

Auriferous reefs have been found throughout the study, and consist principally of steeply-dipping bedded narrow-veined quartz reefs, or auriferous quartz veining. Mining in mountainous country was principally undertaken using adits (horizontal tunnels into hillsides, rather than vertical shafts & headframes common in flatter goldfields). On high plateaus, river-level outcrops, or for exploratory works on outcrops, shafts could be used.

Typical features left by reef mining in mountain areas include adits, fan- or finger-shaped mullock dumps, and lines of open workings on hillsides above adits, from stoping to the surface. Battery sites were often some distance from the mine site, at the nearest available wet gully or running creek below. Where water was available nearby at a similar height, water races may have been run along the hillside. Ore transport was by sleigh track, inclined or level tramway, or flying fox.

Steam engines were often used in early mining to power the batteries, but overshot waterwheels could also be used if sufficient flow was available. Later, around the 1890’s, Pelton wheels were introduced. These required long races to deliver the water to a point high above the battery, and iron piping to deliver the water at high-pressure to the wheel.

Larger mine sites tend to be horizontally-layered, with newer works undertaken at progressively lower levels on the hillside (cf flatter goldfields, with a vertically-layered archaeology - new equipment installed over old). Connecting tracks could be side-cut, with switchbacks. Hut sites and machinery platforms often had to be cut into the sides of hills. Sand dams if installed often had to be situated in gullies, requiring a substantial, stone or log retaining-wall to avoid scouring.

Machinery and equipment relics relate to adaptations to the topography - winding machinery, headframes (poppetheads) etc are rare in mountain goldfields. Infrastructure (huts, machinery etc) is usually situated below mine openings (adits) in mountain goldfields, while in flatter goldfields it is clustered around mine openings (shafts).

Aside from adaptations to topography, a range of other features are visible at reef mines in the study area. Where complex (heavily-mineralised) orebodies were worked below the oxidised zone, treatment of ore was difficult. Roasting furnaces for mineral concentrates were installed at a number of mines, including some good examples at Dart River and Howqua Hills. In early gold mining at Mt Wills, at least one quartz-roasting furnace was built.

In haulage from shallow shafts, whips, whims and windlasses were known to have been used, as well as steam-powered machinery. Cyanidation was practiced at all of the major Victorian reefing fields in the study area, but not in New South Wales. This relates to the scale of workings in NSW, and the
limited amounts of battery sands available from earlier workings. Some chlorination plants were set up in the Victorian section\textsuperscript{55}. Flotation is also known, from Mt Wills\textsuperscript{56}.

The principal reefing fields (on the basis of production) are all in the Victorian part of the study area, at Mt Wills, Ovens River and Grant/Crooked River. A summary of quartz mining production in the Australian Alps is as follows:

- **Mt Wills Historic Area**: Mt Wills goldfield has over 200,000 ounces of recorded reef gold production between 1891 and the mid-1950’s, with the Maude & Yellow Girl workings contributing over 103,000 ounces of the total. Other large mines included the United Brothers (nearly 24,000 ounces), Democrat (13,500 ounces), Yellow Girl (12,000 ounces) and Meerschaum (10,500 ounces);

- **Bogong Unit, Alpine National Park**: The East Branch of the Ovens River contains a large number of reefs, and a probable production in the order of 50,000 ounces of reef gold between the 1860's and the mid-1950's. The major producer was the United Miners, with just under 20,000 ounces of gold between 1866 and 1884. Other good producers were the Monarch (over 7000 ounces between 1896 and 1935), the Champion (est 7000 ounces to 1896), and the Biplane (nearly 4000 ounces from 1920 to 1925). A number of mines have recorded productions of amounts varying from a few hundred to a few thousand ounces;

- **Grant Historic Area**: This contains most but not all of the best reef mines in the Grant & Crooked River goldfields, where over 250 reefs were discovered in the first year. Only a small proportion of these were of sufficient value to receive work. Total reef gold production from the Historic Area was probably 30 to 40 thousand ounces. The main period of working was the few years that followed the initial reef discovery in 1864, and the only major producer was the Good Hope, with just over 20,000 ounces from 1865 to 1914. Much was made of the area's potential to become a major Victorian reefing field, but unfortunately the rich surface stone generally did not persist at depth. Few reefs other than the Good Hope topped 1000 ounces of production;

- **Other fields**: Large numbers of reefs were worked in the Upper Dargo section of the Bogong Unit of the Alpine National Park, but few produced over 1000 ounces. The highest producer was the Evening Star, with under 3000 ounces recorded. Similarly, large numbers of quartz reefs were worked in the Dartmouth Unit of the Alpine National Park, at Dart River and Greens Creek, and although production is poorly recorded, no major gold-producing mines appear to have operated. Recorded reef gold production at the Dart from 1881 to 1890 was over 5200 ounces - the La Mascotte was the best producer, with 1350 ounces. Several thousand ounces of gold were produced from the quartz reefs in the Buffalo Creek belt of the Mt Buffalo National Park. A number of small quartz mines were operated in the Big River, within Mt Wills Historic Area and the Dartmouth Unit of the Alpine National Park, but production is poorly recorded, and assumed to be low. The Howqua Hills Historic Area reefs, despite injection of considerable capital, were disappointing. At Kiandra in the Kosciusko National Park, the reefs were few, and total production is probably no more than a couple of thousand ounces. It could be reasonably assumed that the primary deposits that produced the rich deep leads at Kiandra were located outside the study area, or completely removed by earlier erosion. Elsewhere in


the Kosciusko National Park, reef workings are isolated and recorded production negligible, except at the Grey Mare mine (see below).

• **Isolated mines:** The Red Robin Mine at Mt Loch, in the Bogong Unit of the Alpine National Park, and the Grey Mare Mine, in the Kosciusko National Park, stand as good examples of relatively isolated quartz mines that have had significant gold production.

Total reef gold production within the study area is likely to be between 350 and 400 thousand ounces of gold. Over 50% of this was produced by the mines in Mt Wills Historic Area, and only a few percent came from the NSW section.

(b) **Stanniferous (tin-bearing) lodes:**

Within the study area, tin-bearing primary lodes have been worked principally in the Mt Wills Historic Area, at Mt Wills, and the Kosciusko National Park, at Mt Pilot in the southern section of the Park. Primary tin lodes were also reported from Stony Creek, in the south-eastern section of Kosciusko National Park. Adits were commonly driven at Mt Wills, while small shafts were sunk on the tin lode(s) at Mt Pilot. At Mt Wills, stamp batteries and sophisticated concentrating equipment were installed at some mines. It is doubtful if any machinery was installed on the primary lodes at Mt Pilot.

Total tin production from all primary lodes within the study area is not likely to be much greater than that of Mt Wills - around 160 tons of concentrate valued at no more than £12,000 (1890's value).

(c) **Base metal lodes:**

Small base metal lodes have been opened throughout the study area, for copper, silver/lead, tungsten, chromium, iron, and molybdenum. Very few were developed to the stage of commercial production. The main commercial producers were the copper mines of Lobbs Hole (Ravine) & Yarrangobilly in the Kosciusko National Park, Accommodation Creek in the Snowy River National Park (principally 1960's production) and the wolfram (tungsten) mine at Mt Murphy in the Mt Murphy Historic Area.

By far the largest mine in the Lobb’s Hole/Yarrangobilly copper field, the Lobb’s Hole Mine, has a recorded copper production of less than 1000 tons, between 1874 and 1917. It worked a narrow-veined inclined orebody, up to four feet wide but typically seven inches, which in spite of the low tonnages involved, was quite rich. It was worked by shafts, and a small open cut. Pelton wheel power was used, and a small smelter was installed in 1907.

Most of the exploratory workings on isolated base metal deposits consisted of trenches and shallow shafts. Even on the small number of productive sites, installation of machinery was limited. Concentration of small tonnages or trial lots was often effected crude methods, and with the exception of the Lobb’s Hole Mine, roasting & smelting of ores was carried out in major centres outside the study area.

Production and value cannot be estimated, because returns are poorly recorded, and prices fluctuated considerably over the years. However, it could be reasonably proposed that the value of base metals produced within the study area is in the order of 1 to 1½% of the value of gold production.

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SECONDARY

With respect to the study area, secondary mineral de pOSits are those which have formed as a result of the erosion and re-concentration of materials from primary orebodies or earlier secondary deposits. Mining and heritage features derived from mining secondary deposits will vary according to the nature of the deposit (scale, emplacement, richness etc), and environmental factors (availability of water, topography etc).

The most productive field by far in the study area is Kiandra, in the Kosciusko National Park, NSW, where an estimated 180,000 ounces of gold was mined, almost exclusively from basalt-covered deep leads and the recent alluvial deposits derived from these leads.

Within the study area, production from secondary deposits derives almost exclusively from gold, with alluvial tin production unquantified and negligible economically. Total production is impossible to estimate with any reasonable accuracy, because with the exception of Kiandra, most alluvial yields are unrecorded. However, it is almost certainly less than 400,000 ounces, and probably greater than 300,000 ounces.

(a) Recent deposits:

Mining of recent, shallow alluvial deposits of gold is widespread within the study area, and several localities have been mined for alluvial tin. The methods used are variable.

In early workings in mountain goldfields, California pumps were frequently used to de-water dammed areas to access the river bed. Workings in river beds often diverted the water flow into diversion sluices or tunnels, and the exposed river gravels could be shovelled through sluice boxes. The river banks and higher terraces were ground-sluiced, and later, with water-delivery via high-level water races, were hydraulic sluiced (broken down with high pressure water jets). Sometimes, gold-bearing gutters under the river flats were accessed by networks of shallow shafts and tunnels, and occasionally paddock-holes (large excavations of moderate depth) were sunk on rivers flats. Generally, alluvial goldfields in mountain areas are linear, following the courses of the creeks and rivers, and the river flats & terraces were limited in extent, hemmed in by the towering hillsides.

In flatter areas such as the tablelands of the Alps in NSW, broader alluvial diggings could evolve, based principally on surfacing, ground-sluicing and shallow sinking. At Kiandra, the only references in the historical record to the construction of puddlers were found. These were for processing the recent deposits derived from clayey deep leads. Hydraulic sluicing, as in all flatter goldfields, often relied on costly ventures to bring sufficient volumes of water long distances to the workings.

Workings for alluvial tin in the Alps are indistinguishable from alluvial gold workings. Identical deposits were worked, and recovery, as with gold, relied on the relatively high density of the particles of stream tin.

Heritage features developed in mountain alluvial goldfields include braided streams, and extensive shingle mounds along the river banks, flats and terraces. Tail races may be cut into river banks, and ground sluicing can leave gravel/soil banks of moderate height parallel to the river. Low-level water races, with various downhill headraces leading to the workings, are associated with the latter. Occasionally, trench-like excavations are visible following gold bearing gutters into gullies, or parallel to the rivers. Hydraulic sluicing leaves extensive areas of shingle divided by tail races, and high banks at the limit of sluicing. High-level water races, and very rarely remnant iron piping, are also associated with hydraulic sluicing.

In flatter high-altitude areas, the heritage features developed are similar to those of the flatter goldfields of central-western New South Wales and Central Victoria. At
Kiandra, extensive alluvial flats were formed, and early mining was by shallow sinking, paddocking and ground sluicing. Some of these features are visible today, although the best examples of workings on an extensive alluvial flat, at the junction of Pollocks Creek and the Eucumbene River, have been destroyed by later bucket dredging. Some small-scale hydraulic sluicing was undertaken, but it was not until elaborate water reticulation systems were installed that any large-scale hydraulic sluicing could be undertaken.

Kiandra (including outlying fields) is undoubtedly the most productive in the study area in its recent alluvial deposits, even though the percentages of recent & deep lead productions are not known. Elsewhere in the NSW section, the recent deposits (usually eroding from basalt-covered deep leads) appear to be minor, although little is known about the production on the early Crackenback fields.

In the Victorian section, the Crooked River field may have produced the greatest amount of alluvial gold of recent origin. However, river workings are continuous and extensive in the Upper Dargo, and the East Branch of the Ovens River produced alluvial gold over a long period, with extensive workings and several small rushes. Wombat Creek and the Gibbo in the Dartmouth Unit of the Alpine NP were probably reasonable producers based on the works undertaken, with the section of the Dart River within that Unit probably a minor producer (c.5000 ounces).

(b) Deep lead deposits:

Mining for gold contained in ancient, buried river beds (palaeo-rivers) was undertaken in a number of places within the study area, most notably in the northern half of the Kosciusko National Park, NSW, and in the Bogong Unit of the Alpine National Park, Vic. A small amount of this type of mining was also carried out in the Dartmouth Unit of the Alpine National Park. The leads occur in the highest parts of the Alps, under a resistant basalt cap that has retarded erosion.

These sorts of leads were also very successfully mined on some goldfields in central Victoria, and very similar heritage features to those existing in the Alps have been developed at places like Vaughan, Guildford, Hepburn Springs and Daylesford (sluicing, hydraulic sluicing & tunnelling).

Deep leads in the Alps have been mined by a number of methods, including ground sluicing, hydraulic sluicing and tunnelling. Rarely, they were accessed by shafts sunk through the basalt.

Heritage features developed for larger operations include extensive shingle heaps, tail races, large excavations advancing into the hillsides, adit openings in working faces, etc. Mullock dumps, consisted of overburden or mullock from tunnelling, may also be visible. Rarely, machinery sites are visible, where engines and pumps may have been installed for keeping underground workings dry, or for pump sluicing/jet elevator purposes. Installation of stamp batteries for crushing 'cement' (wash consolidated into hard rock) is known. Dams and long water races are frequently visible.

The broader Kiandra field contains the majority of workings of this type in the study area because of the large number of exposures of basalt-covered leads, and it is undoubtedly the largest deep lead gold producer. Similar but smaller deposits occur at many localities in the northern half of the Kosciusko NP.

In the Victorian section, similar deep leads have been worked at Brandy Creek, Boiler Plain, Tabletop and on the northern edge of the Dargo High Plains. Minor deep lead workings under basalt are recorded along the Gibbo and Mitta Mitta rivers.

Hydraulic sluicing was introduced to Victoria in the mid-1850’s, and was in use in eastern Victoria in the late 1850’s, including at the Buckland River goldfield from 1857. The historical record at Kiandra
strongly suggests that it was in use there in the 1860’s-1870’s, particularly at the Empress. The two largest-scale operations of this type are the Empress claim at the Nine Mile, Kiandra, and the Brandy Creek Mine in the Alpine NP. The Nine Mile workings developed a huge sluicing hole, and at one stage a 250 feet (about 80m) depth of wash was being worked. The Brandy Creek operation sluiced over a million cubic yards of material in its peak years between 1885 and 1889, working a face that was at times 100 feet (about 30m) high. The sluiced area at Brandy Creek has a maximum width (across slope) of about 190m, compared to about 150m for the Empress. The Empress is a deep bowl cut into the hillside, while at Brandy Creek, most of the top of a spur was removed, leaving high (though slumped) faces on the uphill end and western side only.

(c) Stranded leads:

These are unusual deposits, and are the remnants of earlier river courses of the existing systems (as opposed to the deep leads, which represent ancient, radically-different river systems). They occur as disconnected strips of river wash high on the hillsides of the river valleys.

They were generally ground or hydraulic sluiced, and usually required long water races to deliver water to the required altitude. At least one stranded lead in the study area was company-worked, with extensive pumping machinery and jet elevators (New Zealand Hydraulic Co, East Branch, Ovens River, in the 1890’s).

Typical features left by stranded lead mining are long open-ended excavations high on the hillsides, with enclosed tail-races, shingle heaps, and downhill scree slopes of waterworn shingle. Where stranded leads cut across spurs, the workings leave a deep cutting around the spur. Long water races are commonly associated with the workings.

Stranded leads were a feature of the East Branch of the Ovens River (Bogong Unit) and Crooked River alluvial goldfield (Grant Historic Area & Wonnangatta-Moroka Unit of the Alpine NP). They are known from other mountain goldfields within the study area, including the Upper Dargo.

(d) Dredging:

Dredging for alluvial gold was a large-scale mining technology imported from the New Zealand goldfields at the end of the 1890’s, and used successfully in many goldfields to excavate auriferous gravels from river flats and terraces.

The dredge consisted of a floating barge (pontoon), equipped with a bucket-ladder around which a continuous chain of buckets revolved. This bucket chain could be lowered to a suitable dredging depth (typically 10m or less for the early dredges, but up to 40m for later dredges). The dredge sat in a pond, and continuously excavated a working face. The material was processed on board, and tailings were discharged at the rear of the dredge. In this manner, by digging ahead and filling behind, the dredge effectively moved its pond, and by systematic working, large areas of river flat could be processed.

Typical features left by early (pre-1920) dredges include remnant ponds, extensive and uneven shingle tailings, and, rarely, the remains of the dredges themselves (including pontoons, discarded buckets, winch rope etc). Continuous banks of moderate height can be left along the uphill or away-from-stream limit of dredging. In dredging flat land, tailings can be elevated above the original ground level, caused by "puffing" due to a lower stacking co-efficient in the tailings. Very early dredges left wind-rowed tailings heaps, before the development of more efficient "stackers". Land rehabilitation was sometimes practised, leaving few interpretable heritage features.

221
In the study area, dredging has been carried out at several locations. In order of production, these are:

- **Mt Buffalo National Park:** 3 dredges in the Buckland River. From north to south, these were the "Perseverance" dredge (1903-1911), the "Grand Central" (no details known - operating in 1910), and the "Buckland" dredge (1903-1920). The latter produced well over 20,000 ounces of gold, but only a small proportion of its dredging area is within the Park. The Perseverance produced just over 10,000 ounces of gold;

- **Bogong Unit of the Alpine National Park:** 1 dredge in the East Branch, Ovens River. This was the "Bright Star" dredge, which operated from 1907 to 1915. In spite of gold production in excess of 7000 ounces, the company is said to have accumulated losses of £10,000;

- **Kosciusko National Park:** 1 dredge at 2 localities in the Eucumbene River, near Kiandra. It began operations in 1900, as the "Expectation" dredge of Marks & party. It was purchased in 1900 by the Kiandra Gold Dredging Co, who continued its use at Pollock Flat before moving it to Jackass Flat, where operations were suspended in 1904. It produced about 4500 ounces of gold;

- **Wonnangatta-Moroka Unit of the Alpine National Park:** 1 dredge in the Crooked River. This was the "Crooked Creek" dredge, which operated from 1907 to 1911, producing nearly 3000 ounces of gold.

**F. REGIONAL CHARACTERISTICS - NEW SOUTH WALES**

**Northern Half (north of Round Mountain), Kosciusko National Park:**

Gold mining in the northern half of the Kosciusko National Park is predominantly alluvial, exploiting the exposed, basalt-covered deep leads and their associated surface derivatives. The major contributors to production were the Kiandra Lead and the Round Mountain Lead.

The diggings are very limited in extent, and confined to the exposures and the immediate spill of auriferous gravels. This is because the gold source, locked for millions of years under the resistant basalt cap, released its contents within a geologically-short time span, as the lead was eroded. Therefore, gullies can be quite rich close to the exposure, but impoverished lower down. Even at Kiandra, the richest alluvial field in the study area, the Eucumbene River (which has received the erosion products of the rich Kiandra lead) has been worked for only a few kilometres downstream, where presumably it too became impoverished. In other words, the erosion of the lead was too recent for the released gold to work its way any distance downstream.

The Tumut River is the only one that has been subject to mining work over any distance, but even here the workings have been sporadic, reflecting the individual contributions of exposures of the Round Mountain & Kiandra Leads in tributary gullies along its length.

Heritage features tend to be ground-sluicing diggings of limited extent, and shallow shafts. Where the exposed leads were large enough and rich enough to justify complex water retention and delivery systems, hydraulic sluicing was undertaken, leaving large open cuts in the hillsides. Tunnelling on the deep leads was also carried out. Storage dams are a feature of the high-altitude NSW alluvial diggings, but are largely absent from the Victorian mountain alluvial fields, because of the abundance of water at lower altitudes. Gold-bearing quartz reefs are exceedingly rare in this half of the Kosciusko National Park, and hence no consistent river deposits based on the gradual erosion of great thicknesses of reef-containing bedrock have developed.

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Quartz mining

Reef mining is very limited, and no mines of any consequence have operated. However, a few small-scale mines have left an excellent legacy of their operations, in remnant stamp batteries, other machinery, hut ruins etc. Only very basic crushing and recovery technology is represented, and in the flatter areas of the high tablelands, shafts rather than adits characterise the workings. In the absence of reefs, early mining townships based on alluvial diggings rapidly folded on the exhaustion of the deposits (e.g., 4-Mile, 9-Mile).

Lobb's Hole (Ravine) was the only settlement in the northern part of the Park that experienced any extended periods of relative stability, based on the capitalised mining of primary orebodies, and the employment and associated industry it required. However, this was for copper, not gold. Elsewhere in the northern half of the Park, the silver, lead and copper workings consist principally of exploratory trenches and shafts on orebodies, very few of which were developed to the stage of any commercial production.

In the far north of the Park, small gold diggings exist along the Goobarragandra River and its tributaries. These were not visited, but appear to be of limited extent. It is unlikely that they were major producers, because the historical record so scant. A few small-scale quartz workings are situated within this area, but their relationship to the alluvial deposits is not clear.

Southern Half (south of Round Mountain), Kosciusko National Park:

Mining is not as strongly developed as an historical theme in the southern half of the Kosciusko NP. Like the north, the gold mining is predominantly alluvial. The principal fields, Toolong, Thredbo, Crackenback and Diggers Creek (Gungarlin) are characterised by ground sluicing workings and shallow sinking of limited extent.

Few gold-bearing reefs have been worked, but it is interesting to note that the Grey Mare quartz mine has, from the information available, produced considerably more gold on its own than any individual goldfield in the south.

G. REGIONAL CHARACTERISTICS - VICTORIA

Gold mining in the Victorian section of the study area is of markedly different character to that of Kosciusko National Park, except for the deep lead workings of the higher Alps (Bogong Unit, Alpine National Park) that have much in common with the Kiandra field.

The alluvial goldfields are strongly linear, with workings extending for considerable distances along river valleys. For example, the East Branch of the Ovens River has evidence of continuous working for at least six kilometres, within the Park. The workings extend outside the Park into the Upper Ovens Goldfield, where at least 80 kilometres of the Ovens & Buckland Rivers, and Morses Creek, have been intensively worked for alluvial gold. River workings are continuous on the Upper Dargo River upstream of Mayford, for about 12 kilometres. Diggings on the Crooked River (Grant Historic Area/Wonnangatta-Moroka) continue upstream to the base of the Dargo High Plains, and extended diggings exist on the Gibbo River, Wombat Creek, Dart River, Howqua River and Big River.

The character of these fields, which show ground sluicing, river diversions, paddocking and hydraulic sluicing, relates to the origins of their alluvial gold. This gold has been principally derived from steeply-dipping auriferous quartz reefs which have contributed their gold to the valleys during the erosion of the host bedrock over a long period of geological time. The deeply-dissected mountains are testimony to the amount of material eroded, and this gradual process has ensured the gold
concentrates were distributed over considerable distances within the drainage lines of the watershed. Tertiary leads contained in high terraces or existing as stranded leads were worked, a feature that was not noted in Kosciusko National Park.

*Quartz mining:*

While quartz mining was of little consequence in the New South Wales section, it figured prominently in the Victorian Alps, particularly in the Bogong and Dartmouth Units of the Alpine National Park, and attached Historic Areas. Because of the steep topography, the mining was almost exclusively done via adits (horizontal mine openings). Large mines and hence complex sites developed, and those within the study area are typical of mountainous areas in general. The quartz mining fields are characterised by large numbers of operations at a range of scales, from prospecting costeans (trenches) and short adits, to multiple adits and sophisticated processing sites with a range of technologies in evidence. Water races, track networks, tramways and benched hut sites are features commonly associated with the workings.

Because quartz mining was a feature of mining in the mountains of Victoria, it enabled the many gold-based settlements to survive their early alluvial mining eras, and in many cases carry on for decades. Company mining was feature of quartz mining in the latter 1800's, and consequently was more strongly developed in Victoria than NSW.

*Most alluvial and quartz mining fields in the Victorian section are not fully contained within the study area (cf the fully-contained diggings of limited extent in Kosciusko National Park). Some that appear to be relatively small when viewed within the Parks system are in fact part of larger fields with considerable regional impact (eg Buckland River diggings in the Mt Buffalo National Park).*
APPENDIX 10

CONTEXT HISTORIES FOR ALPINE MINING

A. GLOBAL CONTEXT  p 227
B. AUSTRALIAN CONTEXT HISTORY  232
INTRODUCTION:

Production mining is a resource-based endeavour, and occurs at the actual point-of-resource. Whether it does occur is not simply an economic or political decision - there is a more fundamental cultural dimension based on hope, faith, expectation and desperation. This particularly applied to the three great global gold-rushes of the 19th century - California, Australia (Victoria) and South Africa - where the mining cultural landscapes and sites we have inherited may often speak more of human nature or human frailties than of resource development.

Mining in mountainous areas has been carried on throughout the world, and the correlation is not coincidental. In some cases this relates to the contemporary orogenic processes that are not only building the ranges, but depositing the economic minerals. In many cases, it relates to ancient orogenic processes, whose mineral wealth is now being exposed in relatively-recent mountain building events. And finally, mountains are places where primary mineral deposits are easily detectable, compared to lowland flood-plains where the bedrock may be obscured by hundreds of metres of erosion product (silts, gravels etc).

In providing a global context for mining in the Australian Alps, two main factors have been examined:

1. The latter half of the nineteenth century witnessed a massive boost in mineral resource development. For instance, in the 1800's, twice as much gold as had ever been produced in history to that stage was mined. Most of this was produced between 1850 and 1900. Places that provide expression of this boom, based in Western industrial expansion, should be used to provide context. Blainey (1969) refers to "Europe's long search for treasure" in the opening up of the mineral resources of continent after continent. Places should reflect similar western cultural and political values to those that administered or shaped the development of mining in the Australian Alps.

2. The conditions under which mining was undertaken is important to context - that is, similar conditions of winter snow and spring thaw, harsh living conditions, etc. These are dictated principally by altitude and latitude.

In consequence, it has been concluded that the areas that provide the most meaningful global context for mining in the Australian Alps are:

(a) The gold and base-metal mining fields of the high cordilleras of the United States of America (including the Rocky Mountains and adjoining ranges);
(b) The sub-arctic goldfields of Alaska and Canada, including the Yukon River and the Klondike;
(c) The sub-arctic goldfields of Siberia;
(d) The highland goldfields of the South Island of New Zealand.

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This list expands on Jane Lennon & Associates' draft "The International Significance of the Cultural Heritage Values of the Australian Alps" (1999), in which comparisons with the Yukon and Siberia are proposed.

The outlines presented below do not elaborate a comparative analysis, but are included as descriptive pieces to provide the necessary context.

**THE HIGH CORDILLERAS, USA:**

The United States has been a major world gold producer since the California gold rush of 1849, and a major metals producer since the minerals discoveries that followed in the wake of the rush. The main cordilleras (continental mountain chain) of the USA form a vast area of uplands (high plains) and ranges along the central-western spine of the country. Gold, silver and base metal deposits were opened up with a succession of rushes, from Montana & Idaho in the north, to Arizona and New Mexico in the south. Elevations vary to over 4000m - Colorado has the highest peak at 4399m, as well as 51 of the highest 80 peaks in the uplands, and an average elevation of over 2000m. Most of the central and northern uplands experience severe winters - the spring snow melts not only provide irrigation water to fertile farming belts to the east & west, but provide water to massive hydro-electric plants. The largest of these is situated at the famous Hoover Dam, on the Colorado River.

The mining areas are widespread, and many mining towns that sprung up during the various rushes have entered into American folklore, because of their 'frontier' associations and the lawlessness associated with a distinctively-American lack of governmental administration and support. Many early goldfields were very rich, but short-lived. Cripple Creek, nestled on the slopes of Pikes Peak (4300m), Colorado, is probably the most celebrated of the goldfields. The discovery of gold and gold telluride ores in the 1890's triggered the development of a sophisticated gold mining industry. In 1900, it claimed the name of "The Richest Gold Camp on Earth", and nearly 500 mines were operating, with an estimated 2400 miles of tunnels.

However, the cordilleras are probably better known for their silver and base-metal deposits. The Comstock silver lode in Nevada, discovered and worked for gold in the 1850's, became legendary in mining folklore. Not only did it pioneer the efficient mining of large-scale underground orebodies (through development of stoping and timbering techniques), its enormous production was sufficient to significantly affect the world silver markets.

Another famous mine was the Anaconda Company's copper mine near Butte, Montana, which was subject to intense and often violent ownership battles. The Butte area has also been recognised for its 'labor heritage', relating to the struggles and accomplishments of Butte's labour unions. Other well-known mines were the large silver-lead mines around Leadville, Colorado. These are situated in spectacular Alpine scenery, high in the central spine of the Rocky Mountains, and this area also includes major gold mines such as the Mary Murphy.

Today, the mining heritage is celebrated throughout the region. Many mining areas are incorporated into the National Parks/National Monument/National Historic Landmark systems, or otherwise recognised. Mining ghost towns from the 1890's boom times are often well preserved, and are heavily promoted in heritage tourism. Leadville, Colorado, houses the National Mining Hall of Fame & Museum, a showcase of American mining. Mineral production continues to be a major contributor to the economies of most states in the region.

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63 Cripple Creek details taken from [www.goldminetours.com/mkminetour.htm](http://www.goldminetours.com/mkminetour.htm)
64 "Mining Engineers' Handbook", R Peele, 2nd Ed, 1927, p589.
65 Taken from "When Toil Meant Trouble: Butte's Labor Heritage", G Everett (undated: web-published [www.butteamerica.com/labor.htm](http://www.butteamerica.com/labor.htm)).
66 Information from [www.miningcamps.com](http://www.miningcamps.com)
CANADA/ALASKA:

Rumours of gold from the Yukon River in Alaska circulated from the 1830's, yet it was not till the 1880's that a trickle of hardy prospectors began mining at a number of places along the river. All this paled into insignificance with the discovery in 1896 of the wealth of the Klondike, in the Canadian Yukon.

This immediately drew several thousand miners from all parts of Alaska and north-west Canada, but it was the arrival in 1897 at Seattle of two ships from Alaska, carrying 68 lucky Klondike miners and their two tons of gold, that triggered a massive world-wide 'stampede' to the frozen diggings. The arrival was a media event, and a crowd of 5000 people crammed the Seattle wharf to watch the diggers struggle manfully down the gangplanks with their bags and suitcases stuffed with gold.

Over the next eighteen months, about 100,000 people from all corners of the globe started off on the myriad of trails that led to the Klondike. Only about thirty or forty thousand of these finally arrived at the Klondike's Dawson City, a testimony to the harshness of the climate and terrain, where winter temperatures could drop to -40° or -50°C, and in summer the river flats could turn to treacherous black-soil bogs with suffocating clouds of mosquitoes. Tales of the hardships on the trails are legion, and the snow-covered Chilkoot and White Horse Passes have a special place in Alaskan and Canadian folklore. Overland routes across Canada were pioneered, including the politically-engineered and ill-fated Ashcroft Trail, where only a handful of the 1500 men and 3000 horses that set off on the 3300-kilometre journey reached their final goal.

The Yukon River, frozen in winter, promised comparatively comfortable, but expensive, summer steamship access. The river journey of nearly 3000-kilometres from St Michael, Alaska, proved to be anything but luxurious in the chaotic first wave of the rush, with sinkings, ice strandings and mechanical failures.

Some parties attempted direct crossings over the St Elias Ranges, that contain some of the highest peaks on the North American continent (6000m+). Many were never seen again, lost in the crevasses and icefields of the massive glaciers. A few souls struggled back, some dying of cold, exhaustion and malnutrition on the shingle beaches of the Alaskan coastline.

Those hopefuls in the main rush in the spring of 1898 were to be disappointed. The richest areas had already been pegged, and while these claims provided astounding fortunes to their owners, the real gold wealth of the Yukon and its tributaries was realised with the later development of large-scale company mining, using bucket dredges and hydraulic mining. The discovery of vast gold deposits on the beaches of Nome in 1899 effectively signalled the end of the Klondike rush67.

The principal historic themes are those revolving around the 'great stampede' itself - of the world-wide attention it attracted and the media's manipulation of the event. Those of the incredible hardships imposed by the elements, of the follies both political and personal, of the lawless towns in the Alaskan panhandle and the larger-than-life characters they spawned, etc. Broader themes involve the mass movement of people, the pioneering, development and settlement of Alaska and the Canadian west, and the overcoming of geographical barriers.

Today, the events of the Klondike are celebrated and honoured throughout the region. The United States has the Klondike Gold Rush National Historic Park, which includes the Chilkoot and White Horse trails & passes, as well as the old Dyea township site and historic districts in Skagway, Alaska, and Seattle, Washington. Canada recognises the Klondike with a series of National Historic Sites.

Together, the two countries have officially designated a Klondike Gold Rush International Historical Park\textsuperscript{68}.

Gold is still mined in significant quantities in the region. Alaska’s production alone was about half a million ounces per annum in the late 1990's\textsuperscript{69}.

**SIBERIA:**

Gold has long been mined in Russia, with large-scale operations beginning in the Ural Mountains in the early 1700’s. Mining began in various parts of Siberia in the early 1800’s, and after minor gold finds in the Lena River from 1829, the main Lena River goldfields were discovered in the 1840’s. This field consisted of immense placer (alluvial) deposits, spread over 100,000 square kilometres of territory in the vicinity of the Olekma and Vitim tributaries.

Conditions at the Lena River diggings were harsh, with a sub-arctic climate. Winter conditions were cold and dry, with a snow cover of nearly a metre. Mid-winter temperatures plummetted to -40°C, and rivers that would thaw only by June would ice up again in September. Travel was impossible in all but summer conditions. In summer, the temperature could peak at 20°C, with freezing nights. It was no co-incidence that the early miners were a rag-tag collection of toughened local residents, former criminals, political exiles and adventurers.

Development of the field was gradual. The first company was formed in 1861, with limited success. This company was re-organised with British finance, and by the early 1900’s, it had wrested a virtual monopoly over the field, producing one-third of Russia's gold, and a staggering 3% of total world gold production.

Aside from the economic significance of the field, there are important historic themes woven around the on-going struggles of workers to obtain a fair deal, set in a backdrop of the notoriously-bad general labour conditions in Russia, and the particular hardships attending work in the Siberian taiga. Strikes and unrest were epidemic, and were compounded by management indifference and the use of penal labour. Matters finally came to a head when hundreds of striking workers were shot dead or injured in the 1912 Lena River massacre, considered to be a turning point in late tsarist history, that re-ignited the languishing revolutionary spirit across Russia\textsuperscript{70}.

**NEW ZEALAND:**

Gold mining in the province of Otago, New Zealand, dates from the discovery of the golden gravels of Gabriel's Gully, in 1861. It is known principally for its extensive, rich alluvial fields, but quartz mining in high-country at the headwaters of the various rivers also featured in the late 1800’s. Up to 1892, the province had produced almost five million ounces of gold\textsuperscript{71}. Production boomed after this period, as fleets of bucket dredges worked the lower river valleys, most famously the Clutha.

The Alps in Otago are deeply-dissected by broad river valleys of moderate elevation, and rise to a maximum height of 3027m at Mt Aspiring. The higher altitude mining areas are considerably lower than this (mostly 1500m and below), but the influence of the latitude of about 45° means that Alpine conditions occur at lower elevations than in the Australian Alps.

\textsuperscript{68} Extracted from the web pages of the US National Parks Service, and Parks Canada, May 2001.


\textsuperscript{70} Extracted from "The Ninth Circle: The Lena Goldfield Workers and the Massacre of 4 April 1912", M Melancon (undated), and "Gold", Alluvial Exploration (undated).

\textsuperscript{71} ‘Stamp Milling of Gold Ores’, T A Rickard, 1897, p184.
In general the higher altitude mining fields are of limited extent and economic importance. However, the Phoenix mine, nestled in the shadows of the Main Southern Alps at the head of the Shotover River, was one of the best-known quartz mines in the country. Other well-known high-elevation mining areas included the Bendigo field, near Cromwell, and the Carrick Range. Carricktown used to be abandoned during winter due to the conditions. These quartz-mining fields did not develop with any significant rushes, and were generally opened as the slow but inevitable consequence of the alluvial gold discoveries in the valleys. Winter conditions were harsh, and more than one group of miners perished in the snowy passes.

Central Otago has evidence of glacially-controlled gold deposits along the Clutha River, near the town of Cromwell. Here, the river valley was scoured by a former glacier from Lakes Wanaka and Hawea, and the gold-bearing gravels were pushed downstream to their present positions. They existed prior to extraction as terminal (and some lateral) moraines.

Today, a large number of diverse and scattered historic mining sites have been included in the Otago Goldfields Park, managed by the Department of Conservation. Relics of the mining era, including stamp batteries, dredge remains, huts and buildings etc, occur throughout the region, and are strongly promoted in tourism literature.

LINKS:

The above discoveries cannot be regarded as isolated or fortuitous. Rather, they were the result of a succession of events, that gradually opened up or penetrated areas that were previously unexplored & hostile wilderness, or at least sparsely settled and relatively unknown (in European cultural terms). Each new discovery established a new frontier, and encouraged prospectors to go beyond that frontier.

For the Lena River discovery, there was no catalyst event. Gold mining had been carried on in Russia for centuries, and the process was an osmotic one that led east into the inhospitable Siberian taiga.

For the others, the discoveries were not in themselves catalyst events - for Alaska, north-western Canada, the high country of the United States, and indeed Australia & New Zealand, the catalyst event was the California gold rush of 1849. It was here that mining and prospecting skills were instilled in diggers from all nations, but more importantly the event provided the first demonstration at a global level of the liberating power of golden wealth on the ordinary working man.

Prospectors who had honed their skills and obtained their grubstakes in California worked west into the mountains, and north to the Canadian border. Discoveries followed in British Columbia, Canada, then northwards and westwards. The Klondike find was a consequence of prospectors moving up the Yukon River.

In Australia, Edward Hargraves used his Californian experiences (and a deal of shrewdness) to orchestrate the first gold rush, at Ophir, NSW. This set off a chain reaction of new and larger discoveries in other colonies, stimulated by governments desperate to restrain their own populations.

In New Zealand, the first gold discoveries on the Coromandel Peninsula in 1852 were stimulated by a government reward posted in response to Hargrave's discovery. Later, Gabriel Read, a Tasmanian

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72 "Stamp Milling of Gold Ores", T A Rickard, 1897, p184
75 Information from Dr Ruth Lawrence, Bendigo Campus, Latrobe University, 2001.
digger with experience on the Australian goldfields, discovered the riches of Gabriel's Gully in the
Otago district, and triggered the New Zealand gold rushes.  

B. AUSTRALIAN CONTEXT HISTORY

For a continent that ultimately was to prove so rich in mineral resources, it is surprising that it took 53
years from the date of first European settlement for the first metal mine to be established. This was a
silver/lead mine at Glen Osmond in the fledgling colony of South Australia, in 1841. Copper finds
followed, with rich seams at Kapunda in 1842, and that great "bubble of copper", Burra Burra, in
1845, that was famed for its size and richness, and produced over 50,000 tons of copper valued at
nearly £5 million. The state's greatest field, in the Wallaroo - Moonta district, was found in 1851, and
this enabled South Australia to produce 10% of the world's copper for a period in the 1850's.

But the year 1851 is written indelibly in Australia's mining history for another reason. Gold had long
been rumored to exist in the colonies, with shepherds and convicts variously reporting its existence.
The wandering "Count" Paul de Strzelecki found traces in the Wellington district, NSW, in 1839, and
this was followed by reports in 1840 at Strathlondon, Vic, in 1844 at Hadden, NSW (by Rev W B
Clarke), in 1846 at Montecute, South Australia, and 1849 at Glenmona Station, Vic. But it was the
bold public announcement of a gold find on Summerhill Creek near Bathurst at the start of May 1851,
that triggered the first gold rush in the Australian colonies. Edward Hargraves, recently returned from
the California diggings, claimed the original find in February of that year, and carefully orchestrated
the publicity that followed.

Within two weeks, five or six hundred miners were on the field, and the Turon diggings, opened just
after, attracted even greater numbers. The diggings reached hysteria point with the discovery of a two
hundredweight lump of quartz that yielded an unheard-of hundredweight (0.05 tonnes) of pure gold.

These finds were almost immediately eclipsed by discoveries in the newly-declared colony of Victoria
(formerly the Port Phillip District of New South Wales). Gold was found at Clunes in June, Mt
Alexander in July, Buninyong/Ballarat in August, and Sandhurst (Bendigo) in October. The Mt
Alexander rush, beginning with the discovery of the surface wealth of Golden Point, Forest Creek, in
September, turned the Australian rushes into an international event. The arrival in England of five
"ships of gold", laden with the riches of Mt Alexander, precipitated a mad scramble for the colonies.
Sixty-seven thousand ounces were taken out of Forest Creek in the first two months, and the central
Victorian fields had produced quarter of a million ounces by Christmas. Bendigo and Ballarat went
on to become the colossi of Victorian mining, based on immense quartz & deep lead deposits
respectively, with Bendigo ultimately producing some 22 million ounces of gold.

The search for gold continued in the 1850's. Many new goldfields were opened in Victoria and New
South Wales, but aside from the ill-fated rush to Canoona, Queensland, in 1858, these states
monopolised production. New South Wales gold output in the 1850's was only 7% of Victoria's, but
the discovery of major goldfields at Forbes & Young, and the brief, bright flare of Kiandra in the
Southern Alps, enabled New South Wales to claw back some of Victoria's dominance. For a period in
the early 1860's, production rose to around 25% of Victoria's, and for four years, gold outstripped
wool in importance in New South Wales.

In 1861, South Australia's monopoly on copper production was broken, with the establishment of a
copper mine at Peak Downs, Queensland. The golden wealth of this state began to be revealed - the

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Gympie field was opened in 1867, and Charters Towers in 1871. Mt Morgan was discovered in the early 1880's. Australia's most famous mine, the Mt Morgan Company's mine, developed on this hill of gold, and produced £13 million worth of gold and £7 million in dividends in its first 21 years of operation. And the hill of gold had a copper lining, whose dividends later financed the development of Great Britain's oil interests in the Middle East.

Tin had been occasionally found mixed with alluvial gold deposits, but little commercial mining had been done until deposits were discovered at Inverell, NSW, in 1871. Vegetable Flat alone produced an incredible yield of 15,000 tons of stream tin. Tinlands stretching from Stanthorpe, Queensland, to Tingha, NSW, were opened. With the discovery in 1871 of Tasmania's mountain of soft tin oxide, Mt Bischoff (the greatest tin lode then known), it enabled Australia to become for a time the world's largest tin producer.

Other great metal fields were opened in various parts of the country. Copper at Cobar, NSW, in 1870, silver at Silverton, NSW, in 1882, silver/lead at Zeehan, Tasmania in 1882, and copper at Mt Lyell, Tasmania in 1886.

The greatest Australian mineral deposit of all, Broken Hill, NSW, was developed from the mid-1880's. This silver/lead/zinc field not only contributed massively to the economies of New South Wales, South Australia and Australia, but developed the new processing technology of selective flotation, that influenced base-metals mining around the world.

Meanwhile, the gold trail wound its way around the continent. Gold was discovered at Pine Creek, Northern Territory, in 1871, in the Kimberleys, WA, in 1886, and the Pilbara, WA in 1888. These, however, were only the sideshows leading to the discovery of what was to become Australia's greatest goldfield. Coolgardie was opened in 1892, and Kalgoorlie in 1893, and the golden riches of this region were to make second it only to the Transvaal in South Africa. Early yields were phenomenal, and the Bayley's Reward mine produced over 25,000 ounces from the first 48 tons of ore crushed. This field, and the Pilbara, eventually enabled Western Australia to overtake Victoria as the highest gold producing state.

But at the end of the nineteenth century, Victorian gold had still provided half of Australia's metallic wealth, an eminence that was being swiftly eroded by the major metal mines of New South Wales, Tasmania and Queensland, and the goldfields of Western Australia.

The copper fields of Mt Isa, Queensland, were discovered in 1923, and later in the century, a welter of "New Age" finds, their wealth revealed by new demand, or new large-scale mining and processing techniques. Many were, and are, of world-class, and include massive bauxite (aluminium) deposits in Northern Australia, iron ore from the Kimberleys & Pilbara, and deposits of uranium, nickel & other metals.

AUSTRALIAN ALPS MINING HERITAGE
CONSERVATION & PRESENTATION STRATEGY

APPENDIX 11

COMPARATIVE & SIGNIFICANCE DISCUSSION

A. PREVIOUS STUDIES p 237
B. UNIVERSAL VALUES 237
C. NATIONAL VALUE 239
D. MINING FIELDS - PRODUCTIVITY 241
E. THE INFLUENCE OF MINING IN THE ALPS 242
F. THE CHAMPION MINE, VIC 246
A. PREVIOUS STUDIES

No comprehensive assessments have previously been undertaken for historic mining sites or landscapes in the New South Wales section of the study area, although areas of possible significance have been canvassed (Argue, 2000 & Lennon, 1999).

In Victoria, sites within the study area have been assessed as part of the statewide Victorian Goldfields Project. Results have been included in:

- *Historic Gold Mining Sites in the Gippsland Mining District*, DNRE, 1998;

There are probably in the order of several thousand mining sites within the study area. Some are well known. Some are clustered together in the form of accessible alluvial diggings. However, a large number are in remote, rugged bushland, and it has been possible to visit only a very small percentage of these within the time and budget constraints of the project.

B. UNIVERSAL VALUES

COMPARATIVE ANALYSIS:

Global context histories for four similar areas around the world have been presented in the previous appendix, and for three of these (Klondike, Siberia, Rocky Mountains), strong historical themes of global importance are indicated.

For Siberia (Lena River), Russia, these themes revolve around:

- The massive economic value of the gold deposits (world-scale);
- The British financial interests that used profits for commercial investments around the world (including middle-east oil interests); and
- The goldfield's catalyzing action in the events of the communist revolution, which changed the face of world politics.

The Klondike, Canada, was a short-lived international media event, which triggered an enormous single wave of migration ('stampede') from all corners of the globe. Its global significance probably lies in its best-expression of themes relating to mass migration, pushing back the frontiers, hardship etc.

For the Rocky Mountains, USA, the global significance revolves around:

- The massive scale of the base-metal and gold deposits (world-scale, that in some cases significantly affected commodities prices, and that in general may have helped underpin the emergence of the USA as a world economic power); and
- The development of new large-scale mining & processing technologies, that in some cases radically changed the way metals were mined and processed around the world.

All three places have strongly developed themes relating to the particular hardships and isolation of working and living in harsh sub-arctic or alpine environments.
By comparison, the mineral deposits of the Australian Alps (study area) were very limited, and certainly not of national scale, let alone world scale. No historical events associated with mining in the Australian Alps reverberated beyond Australian shores, nor did mines themselves or the people associated with them contribute significantly to the development of the world-wide industry.

The themes of hardship and isolation relating to the topography and harsh environment were evident, but because of the very small size of the alpine areas within the Australian Alps, and the relatively short winter season, they were not as strongly developed. There was only one significant over-wintering at diggings within the high Australian Alps (perhaps one to two thousand miners at Kiandra, 1860), and in most cases, workings at high altitude could simply be abandoned during the height of winter.

EXAMINATION OF POSSIBLE UNIVERSAL VALUES:

The existence of mining cultural heritage values of a universal value within the Australian Alps has been canvassed but not resolved in several recent reports, including Lennon & Associates, 1999, and Argue, 2000. Jane Lennon proposed the following areas for evaluation:

"... Australian alpine mining was earlier in its origins" (than the Yukon & Siberia). "It may have influenced later alpine mining practice elsewhere in the world as well as being influenced by American practices."

Firstly, gold mining in Siberia had been undertaken from the early 1800's, and therefore pre-dates alpine mining in Australia. The deposits were widespread, and were worked by a relatively sophisticated gold mining industry that had existed in Russia from the early 1700's. This industry had previously exploited deposits in areas with considerably harsher climates than the Australian Alps (e.g. northern parts of the Ural Mountains). Goldfields at considerable altitude in the Sierra Nevadas of northern California, USA, had been opened in the 1850's. In Europe, mineral deposits in alpine and sub-arctic regions had been mined from ancient times.

Secondly, the early Australian alpine mining appears to have developed no new mining or processing practices to adapt to the environment, and therefore it could not exert any influence in later alpine mining elsewhere in the world. This lack of adaptation is partly attributable to the relative paucity of mineral resources at high altitude in the Australian Alps - that is, significant resources dictate year-round operation, and adaptation to ensure efficient mining and recovery. It was compounded by the small size of the Alps, where it was not difficult to move elsewhere during the height of winter.

"The Australian gold rushes are an outstanding example of the global migrations associated with the nineteenth century gold rushes which led to Australia being the world's largest gold producer by the end of the century. The alpine region experienced alluvial rushes followed by half a century of sustained quartz reef and hydraulic mining. This sub-theme" (integration of a continent into the global economy) "with its regional variation is of integral value to the overall assessment of Australian gold rushes as having outstanding universal value. Kiandra and Mt Wills would be places to represent this sub-theme as having outstanding universal value as regional expressions of the value."

Australia was briefly the world's largest gold producer in 1903, but this was not a gradual process of consolidation based on the early gold rushes. Rather, it was due to the spectacular rise in production from the newly-discovered Western Australian fields, which were then in turn rapidly and overwhelmingly eclipsed by the Transvaal (South African) fields. The rich Cripple Creek (USA) field, opened in the 1890's, also enabled the United States to again eclipse Australian gold production after 1903. The Australian alpine fields contributed an insignificant amount to the production at this period, and their previous contributions, either in terms of aggregate production or their stimulation to the mining industry, were similarly minimal. Mt Wills was not part of the gold rushes, and saw little individual enterprise following the discovery of reef gold within the existing tin leases in the late 1880's.

88 By 1908, the South African fields were producing twice as much gold as Australian fields. For world production figures of this period, refer "The Cost of Mining", J Finlay, 1909, tables pp332-335.
The Australian gold rushes that are of outstanding universal value are those that stimulated or received the global migrations (eg the Mt Alexander rush, Victoria, 1852). There is no strong evidence to suggest that the Kiandra rush of 1861 was anything more than essentially an internal population adjustment, and its relative lateness, size (small in national terms) and briefness limited any potential it may have had to contribute to universal value.

The Kiandra rush could not be considered as a “subsequent” rush that contributed in a major way to the patterns of settlement of the continent (Lennon, 1999:31), because it failed. That is, it was an unsustainable settlement after the rapid exploitation of its limited gold resources, and the minor benefits of its relatively small aggregate production were dispersed elsewhere. In this sense, Kiandra could not compare to areas, say, such as Young & Forbes in NSW and Bendigo & Ballarat in Vic, where gold rushes led to establishment of major towns and intensification of farming, that sustained the areas beyond exploitation of the gold resources. Kiandra may have played a valuable regional role in opening up the high country (establishing road networks etc), but its direct physical legacy is only the abandoned mining sites and landscapes we see today.

Neither Kiandra nor Mt Wills could be considered as regional variations contributing to the outstanding universal value of the sub-theme. Within the study area, the Buckland River rush of 1853 (with six to eight thousand participants) is more significant in these terms. While it also was essentially an internal population adjustment, its discovery and richness did contribute to the notion that Australia was a land of gold, at a time of significant early migration. However, its links to the actual ground contained within the study area (on the periphery of Mt Buffalo NP) are tenuous and unproven, and the best expressions of this rush are outside the Parks system.

UNIVERSAL SITE VALUES:

The absence of world-class mines in the study area probably limits the potential of Australian Alps mining sites themselves to exhibit outstanding universal historical values.

Historic mining sites throughout the Alps show evidence of different mining and processing technologies, developed to take particular account of the type and nature of the orebodies. In gold mining, a whole suite of technologies are represented, and the remoteness of many sites in mountain areas has meant that evidence of the development and use of technologies is particularly well-preserved in the fabric. These sites include early chlorination and cyanidation works, battery & machinery sites, roasting works etc, and in Victoria a number have been included in the Victorian Heritage Register as best expressions of various technologies. At a global level, it is impossible to say whether any of the sites may have outstanding technological value, because there is very limited comparative data available.

However, it can be said that none of these technologies were pioneered in the Australian Alps, other than perhaps minor ‘tinkering’ with processes to suit the individual orebodies, a standard undertaking at mines throughout the world to maximise efficiency of basic processes. All of these technologies were used worldwide, including many similar mountainous mining areas elsewhere, and hence it would indeed be fortuitous if any sites exhibited outstanding universal technological value. (see also part F. of Appendix 10).

C. NATIONAL VALUE

KIANDRA:

Several points for assessment of National values are raised by Argue (2000). These relate to the Kiandra-Tabletop-Round Mountain goldfields, and are:

The goldfields are "... an unusual mining group in Australia, one where heavy snowfall meant abandoning mining or modifying methods for many months of the year."

The high-altitude fields are part of a class of mining fields in Australia where climate severely restricted mining. Heavy snowfall was the factor in the Alps - this blanketed the diggings, and tied up available water
in a frozen form, rendering it unavailable for processing purposes. Elsewhere in Australia, extreme heat, arid seasonal influences, and the northern cycle of wet & dry seasons similarly influenced mining. These influences do not always interpret well in the historic fabric, although they do in the context (environment) for the period of the year when the influences applied (ie periods of snow, extreme heat/dryness, wet etc).

In the Alps, it is very rare for modifications of method to show in the fabric, simply because only rarely were modifications to the actual mining/processing methods used, and where undertaken were very minor. For example, ground sluicing in the high altitude fields was undertaken in exactly the same manner as ground-sluicing anywhere, within the normal variations of individual preference and site-specific topographical and water supply limitations. There are no characteristic high-altitude signatures visible in such extant mining sites in the Australian Alps.

At Kiandra, winter snow fall does not appear to be an important limiting factor in many later larger scale sluicing or hydraulic sluicing ventures. Lack of sufficient water volumes was the limiting factor - some could only operate from six to ten weeks a year for this reason (refer Andrews, 1901).

Probably the outstanding mining places in Australia that demonstrate climatic restrictions on mining & miners are the opal fields of the arid areas, where even today mining populations drop dramatically over summer. Further, the adaptation of living underground in "dugouts" is evidence in the fabric of the fierce summer conditions that apply, and the lengths that people have gone to sustain mining in a hostile environment. Arid area mining adaptations also relate well to Australia as an arid continent, and best expressions of climate-adapted fields are not necessarily contained in the very limited and "unusual" geographic areas such as the Alps.

However, the Alps mining fields do have National values as one extreme of the mining conditions encountered on the continent, and this is examined later.

"Also unusual is the combination of ground sluicing, hydraulic sluicing and tunnelling methods."

This combination of methods is not unusual. While the broader Kiandra goldfield is probably the best expression within the study area, it is also represented throughout the Australian Alps where similar basalt-covered deep leads occur, notably at the Brandy Creek-Boiler Plain-Tabletop goldfield of the Alpine National Park. This combination of methods for working basalt-covered deep leads is more strongly represented at several major central Victorian goldfields, including Daylesford, with a significant level of activity and production. Elsewhere, it is quite common for more geologically-recent exposed leads to be ground-sluiced at their exposure, hydraulic sluiced to their economic limit (ratio of overburden to auriferous gravel), then tunnelled into (high-graded). Good examples exist just outside the Alpine National Park, in the Buckland Valley, Omeo district, etc.

"The protection of this goldfield in a National Park has resulted in it having been very little modified (Pearson, 1979:19) and thus it is likely to be in a state of relative intactness to warrant national heritage status. Further, it has the potential to demonstrate the gold mining process and appears to have a distinct and demonstrable Chinese village area, including house remains, Chinese artefacts."

The protection of this goldfield in a National Park is very recent compared to the heyday of Kiandra in the early 1860's, and therefore has not significantly influenced its preservation. Indeed, the NSW National Parks & Wildlife Service itself actually demolished most of the remaining buildings of the township in recent times. While there are extensive diggings surviving, their intactness is only moderate, and certainly not enough to warrant National status on that basis - like all old fields, the diggings show the depletions of time. Little machinery or above-ground infrastructure survives, and occupation sites exist as archaeological fabric. In the Kiandra township, building demolition was accompanied by bulldozing, compromising or destroying the archaeological record. Large quantities of tailings were said to have been removed for construction purposes by the Snowy Mountains Authority (Pearson, 1979), and may have contributed to the present visual aspects of the Homeward Bound claim (tracks, deep pond, fresh faces etc) and other features on New Chum Hill.

The field is "complete", but this relates to its failure, and the unsuitability of the surrounding area for on-going human activities that would be destructive of mining heritage values. It shares its completeness with many other mining fields, principally those elsewhere in the more rugged sections of the Great Dividing Range of eastern Australia, and a number situated in desert/arid regions. The Kiandra field shows largely alluvial mining methods, and is therefore limited in demonstrating a wide range of mining processes and technologies.
The Chinese village is just another feature it shares with most nineteenth century alluvial gold mining fields, and these archaeological sites are abundant. Perhaps the difference with Kiandra is that archaeological studies have been undertaken to reveal its features, while the potential of so many other Chinese camp sites throughout the State and country have yet to be explored. Certainly the recorded history of the Chinese miners at Kiandra, other than perhaps their special roles as organised carriers of supplies, has nothing to recommend Kiandra as a particularly important Chinese centre.

Notwithstanding the above, the broader Kiandra goldfield does demonstrate National cultural heritage significance values in relation to the conditions under which mining was undertaken. This is social significance, under the general historical theme "Struggling with remoteness, hardship & failure" (Australian Historic Themes Framework, Theme 3.16). In this sense, it is not the mining itself but the context that is important. Significance is indicated under Criteria C.2, A.3 and B.2 (AHC).

This National significance is most dramatically interpreted in the landscape rather than at individual sites. That is, it is outstanding in the combination of a range of mining-associated cultural features within an Alpine natural environment (refer section Landscapes for description).

Register of the National Estate:

Several areas of National significance are given in the registration of Kiandra in the Register of the National Estate (Identifier: 1056), and require examination:

- Criterion A.4: The Statement of Significance says that "Kiandra, the largest field above the snowline, was also a major NSW gold field and an important mining area in national terms." It was the largest field above the snowline, but is a relatively small NSW gold field, and a very minor one in national terms.
- Criteria C.2, A.3 & B.2: Defendable in national terms.
- Criterion G.1: The Statement of Significance says that "The Kiandra mining area is of cultural significance (value) to a large number of Australians". Criterion G.1 is easily claimed, but not easy to defend. At a national level, mining places such as Kalgoorlie, Broken Hill, Bendigo & Ballarat would be fairly safe places to assert national significance under G.1. Kiandra would require supporting evidence, which has not yet been produced (refer "Mining Heritage Places Assessment Manual", Pearson & McGowan, 2000, p32).

It has been proposed that the miners of Kiandra were the forerunners of the ski industry in Australia. The first recorded recreational skiing took place in Kiandra, and it had the first recorded ski club. It is also said to have introduced the first T-bar ski tow. However, to assign any national historical significance would require proving that Kiandra directly influenced the development of the industry, not only in the New South Wales skifields (which, except for the recent Mt Selwyn development, are geographically some distance from Kiandra), but in Victoria and Tasmania as well. This task is beyond the scope of this project.

D. MINING FIELDS – PRODUCTIVITY

It could be said that for gold, the Alps have been at least as productive as the rest of Australia, for their area. However, it should be noted that modern gold production is enormous (some three times higher for the 1990's than any decade in the past) and on-going, while the Alps production was virtually finished by the 1950's. Victoria's gold production from the 1850's to the 1950's averaged over 3oz/hectare over the whole area of the State.

The Australian Alps National Parks encompass about 1.6 million hectares of Australia's 770 million hectare landmass, or approximately 0.2% of the continent. Its gold production, estimated at, say, 750,000 ounces, represents just over 0.2% of total Australian production, recorded at about

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89 From information on interpretations boards, Heritage Trail, Kiandra.
90 State & national production figures taken from the Australian Gold Council's web site.
320,000,000 ounces. Historical gold production from the Alps represents an average production rate of about 0.45oz/hectare, compared to the national rate of 0.42oz/hectare.

In relation to national cultural heritage significance of the Australian Alps mining fields, the following can be stated:

- The fields are of low national economic importance, both in aggregate production, and production of each metal (gold, copper, tin, tungsten, lead, silver etc). Further, even at times of peak Alpine production, their contribution to annual national production was slight;
- The fields have low historical significance in national terms, in terms of production, stimulus to or effect on the Australian mining industry or the development of the Australian nation in general;
- Alpine mining shows very few characteristics that are not well represented elsewhere, and those characteristics that are unique are very poorly developed, consisting of rare, minor technological adaptations.

In base metals, the relative contribution of the Australian Alps study area to national production is miniscule.

E. THE INFLUENCE OF MINING IN THE ALPS

REGIONAL INFLUENCES:

New South Wales

Areas around the Snowy Mountains had been sparsely settled well before the discovery of gold, and summer grazing had been carried out on the high plateaux. Gibson grazed cattle near what was to become Kiandra in 1828, and Yarrangobilly station had been briefly operated, but abandoned because of the severe winters. Summer grazing had become established by the mid 1830's.

Trails into the high country had been blazed, to move stock in and out.

The golden wealth of Kiandra was discovered at the end of 1859 by the Pollock brothers, who had combined fossicking with their tending of sheep on the Kiandra plains. In a space of just a few months, this discovery brought some 10,000 people into the heart of the high country.

Immediate local influences:

Mining works: The landscape within the diggings was rapidly changed, as the gold-bearing gravels were progressively sluiced for their gold.

Infrastructure: The township of Kiandra sprang up almost overnight, and where only months before the Pollocks tended their sheep in solitude, a large township sprawled. At one stage, this included 25 stores, 13 bakers, 16 butchers, 14 public houses, bank and 4 blacksmiths, in addition to government buildings including police station, post office, commissioners camp, etc.

Immediate regional influences:

Prospecting: The richness of Kiandra inspired prospectors to try their luck in the surrounding country, and a number of rich mining fields were opened in rapid succession, some attracting considerable populations, and attendant infrastructure (eg 4-mile, 9-mile, 15-mile, etc). Prospecting was carried on throughout the Alps - gold diggings were opened on Snowy Plain in 1860, Crackenback circa 1864, Thredbo (early 1860's?) and other areas.

This was the first intensive exploration of all environments in the Alps by Europeans, as compared to the earlier limited search for summer grazing lands.

Government: The NSW government was quick to realise the potential of Kiandra, and saw it as a means of drawing populations back into NSW from the pre-eminent goldfields of Victoria. They drew up plans to co-ordinate an expected post-winter rush in 1860, and installed police stations, lock-ups and stables along the strategic tracks to Kiandra. These were installed at locations including Denison (Russell's), West Denison (Providence), Yarrangobilly, Lobbs Hole, Cooma, Queanbeyan, etc.

Roads: Graziers’ trails suddenly had to cope with considerable traffic to and from the goldfields, and many were unsuited to wheeled vehicles and the transmission of large volumes of provisions and materials. New trails were cut between goldfields. The government was forced to act, and began a program of cutting roads adequate to the use. The Kiandra-Denison road was cut by September 1860\(^\text{92}\). Some roads were realigned, and side-cuts undertaken.

Regional towns: Local histories throughout the region acknowledge the influence of the Kiandra rush in the development of small towns at what were previously only centres of farming areas, or wayside stops. Jindabyne, site of a ford over the Snowy River, prospered with the development of the Thredbo & Crackenback diggings, and the general raised level of passing traffic. Yarrangobilly grew from a hastily-erected shanty on the Kiandra road, to which a police station was added, and was later sustained by farming. Adaminaby was a direct result of the rush. While the former ‘Adanimibby’ station and several larger holdings existed before the rush, it was in September 1860 that farm allotments were surveyed to provide produce for the diggings, and Commissioner Cloete of Kiandra envisioned a “valuable township” being created. The township grew on the basis of this concentration of farms, in spite of the rapid demise of Kiandra as a major goldfield. A small township near Lobbs Hole grew around a wayside shanty and Kiandra-bound coach terminus. It was sustained by passing traffic and, in later years, by farming and copper mining. Elsewhere, towns situated on major access routes acknowledged the benefits of the rush, and the provision of government infrastructure (police stations, etc).

Regional industry: (The benefits to regional industry are assumed by the circumstances of the Kiandra rush, and limited circumstantial evidence. This is an area of Alps history that could be confirmed and developed by further research). It is probable that Kiandra was largely responsible for initiating the logging/sawmilling industry within that region of the Park (Sawyers Hill etc), because of the need for construction materials for the township, for fuel, and for mining purposes\(^\text{93}\). Further south on the Thredbo River, an interesting connection is visible - at a sawmill site opposite Bullocks Flat, a countershaft lying on the ground is made from a stamp battery stem, complete with tappet. In mining areas in other districts (eg Eastern Highlands of Victoria), it is not unusual for sawmillers to have salvaged and used abandoned mining machinery (steam engines etc).

Lasting influences:

Historic mining fabric: Throughout the Park, historic mining activities have left a visible legacy of abandoned diggings, tracks, huts & hut ruins, water races, dams, machinery etc.

Road & track networks: Stock trails existed into and across the NSW Alps before the discovery of gold at Kiandra, but it was this and subsequent gold discoveries that initiated government action in cutting roads through the region. Some of the roads are now major highways (eg Snowy Mountains Highway). Other mining tracks now form part of the network of management and walking tracks in the Kosciusko National Park (eg Tabletop Mountain Trail).

\(^{92}\) Letter from Commissioner Cloete, September 1860, quoted in Historic Kiandra, 1959, p27.

\(^{93}\) Refer “The Alpine Sawmills: A Short History of Logging Between Adaminaby and Kiandra”, D Turner, in “Cultural Heritage of the Australian Alps”, 1992, AALC, p269. This examines milling from 1867, but does not refer to the logging and sawmilling must have been undertaken from 1860 (although not necessarily under licence). The first licenced sawmiller was brought to the Kiandra rush with his family, but in 1867 was based in Jindabyne.
Towns: Many towns surrounding the Kosciusko National Park acknowledge the contribution of the Kiandra rush in providing a rapid impetus to their development.

Agriculture: It is probable that Kiandra and other major regional fields influenced the patterns of agriculture in the region, particularly in the initial development of more intensive farming and grazing in areas peripheral to the Park. The government survey of farming allotments at Adaminaby in 1860 (see above) is a good example of the broader influence that an event like Kiandra can exert.

Development of the skiing industry: Refer also Appendix 10.

Later mining works were often carried out part-time by local farmers and graziers as valuable supplements to their incomes, and while this activity features strongly in recent oral history studies in the NSW Alps, it should not be construed that this formed any sort of basis of mining in the NSW Alps. The 10,000 diggers at Kiandra in 1860, the 1000 odd at 9-Mile, hundreds at 4-mile, 250 at Toolong in 1894, perhaps hundreds at Crackenback, etc, were (for that period of their lives) miners, not graziers. These early periods provided the great bulk of the gold production and primary modification of the landscape, and the greater legacy of mining in the NSW Alps.

Victoria:

Unlike New South Wales, Victoria’s Alpine high country was virtually unexplored before the discovery of gold, and the often-quoted 1843 journey by John Mitchell to the Bogong High Plains did not occur. There is but a single (anecdotal) reference to cattlemen from Cobungra exploring the Bogong High Plains in 1851, and pioneering the route from the Cobungra to the Ovens valley via Mt Hotham94. However it is documented in contemporary records that in 1852, Crown Lands Commissioner Henry (WH) Smythe of Benalla attempted to find a route from the Ovens River to the then-almost-abandoned goldfield of Omeo, but was turned back by snow95. Who actually did pioneer the route remains conjecture. In 1854, Dr von Mueller came up to the high plains from the Dargo side, and named Mt Hotham, claiming to be the first European to visit those parts. There is little strong evidence that summer grazing took place on the high plains until into the 1860's, and the first licences were not granted until the 1880's.

Early settlers at Omeo came over the mountains via southern New South Wales, but the limits of settlement and exploration were defined by the broad pasture of the local valleys. Broader valleys at the foot of the Alps (and outside the study area) such as the Ovens and Dargo were occupied by squatters from the late 1830's, but there is no evidence that they entered the high country before gold was discovered. Gold was discovered at Omeo in 1851 and at Beechworth in 1852 - the Ovens valley deposits were being worked in 1853, and in 1854 it was noted that the Ovens valley was being traversed by miners travelling from Beechworth to Omeo96 (via Mt Hotham). This is the first contemporary account of Europeans regularly crossing the Victorian high country.

The influence of gold mining within the study area expanded rapidly in the late 1850's, as a succession of rich fields were opened up. Omeo was an important centre, and the osmosis away from here gradually reached further into the rugged mountainous areas to its north and north-east. These are the now-abandoned goldfields of the Dartmouth Unit of the Alpine NP and Mt Wills Historic Area. Here, these were the only strong European cultural influences before the advent of large-scale, commercial saw-log production.

From the Ovens valley and Dargo, a succession of fields were opened up around and within the high country, now part of the Bogong Unit of the Alpine NP and the Grant Historic Area.

The influence of mining was dramatic and long-lasting. A road network, which often included shanties and way-stations, was established through the study area. These were not just trails, but had to bear the traffic of heavy machinery with the conversion of many of the fields from alluvial to reef

94 Information attributed to one of the McNamaras (well-known cattlemen of the high country in Victoria), in an interview with Maisie Carr in 1960 - anecdotal, and over one hundred years removed from the event.
95 Quoted in “History of Gold Discovery in Victoria”, Flett, 1970: referenced to Commissioners & Wardens Reports, Jan 1852.
96 Commissioners & Wardens Reports, 2 Nov 1853 & 28 Oct 1854.
mining. This road network was added to as required, and was considerably extended in the late 1800’s by government-sponsored mining tracks to promote prospecting. This latter activity opened many little-explored areas, including the Upper Murray region in the 1890’s97 (Cobberas-Tingaringy Unit, Alpine NP). It also provided better routes between fields and towns. More than 550 tracks and roads were cut in Eastern Victoria, and many are within the study area.

Numerous townships sprang up in the wilderness, and the infrastructure to service the mines and the miners was installed. Some former gold towns that survive today, outside the Parks system, owe their existence in part to gold deposits within the Parks system. Examples are Harrietville, Dargo and Omeo. The historical production, some two to three times that of the NSW section, contributed significantly to the regional economy for nearly one hundred years.

**Lasting influences:**

**Historic mining fabric:** Throughout the Parks and Historic Areas, mining activities have left a visible legacy of abandoned diggings, roads, tracks & bridle-tracks, huts & hut ruins, town sites, mullock dumps, water races, tramway lines, dams, machinery sites, abandoned machinery etc.

**Road & track networks:** Mining was the first European activity to impose a road and track network on the high country, and the relative longevity of the mining fields ensured that the tracks were well-imprinted in the landscape. The construction of over 550 mining roads and tracks in Eastern Victoria was sponsored by the Mines Department in the late 1800’s to early 1900’s. Some are still in use today (eg parts of the Omeo Highway and Great Alpine Road), and others form part of management, fire and walking track networks within the Alpine NP and surrounding Historic Areas.

**Towns:** Many surviving former gold towns surrounding the Alpine National Park have directly benefited from the historic mining activity and production of goldfields within the study area.

**Agriculture:** The goldfields within the study area have influenced the patterns of agriculture in the region, particularly when taken in the broader context of their extensions outside the Parks system. The breaking-up of the squatters’ runs in the valleys leading into the study area and the development of more intensive agriculture appear directly related to the need to provide for large mining populations in the region. This flourishing market put pressure on stocking rates of local grazing properties, and may have provided the stimulus to undertake summer high plains grazing.

**Regional Industry:** Apart from intensive agriculture (see above) and the likely initiation of local sawmilling operations, the goldfields within the study area itself do not appear to have stimulated lasting industries within the region. However, as incremental contributors to a regional economy, their influence may have been broader.

**Tourism Development:** The development of high country tourism is directly related to the decline of the Upper Ovens goldfield in the 1880’s98. The businesses of the main commercial centre, Bright, were suffering, and needed a new industry to provide a boost to their economic base. Mt Feathertop, Mt Hotham and Mt Buffalo were promoted by the Alpine Club and the Tourist’s Club, and a ’celebrity’ Alpine Trip featuring eminent scientists of the day was organised and duly publicised by the Tourist's Club. The use of skis was first recorded in the Upper Dargo & Hotham in the early 1860’s. Early recreational skiing used the facilities of the hostels that had been originally established to service the mining populations travelling over the mountain (Mother Morrell’s, etc).

**FUTURE RESEARCH DIRECTIONS:**

In examining the influence of cultural activities, it is relatively easy to assess impact while particular conditions applied. Summary local histories for areas within and around the Alps are littered with

97 Refer “Barr’s Creek, A Mystery of the Upper Murray”, J Murphy, 1998, for reproduced source material.
compartmentalised views of Alps history. That is, there was the Aboriginal phase, followed by the squatting/exploration phase, followed by the mining phase, followed by the grazing phase, etc etc. The real measure of influence is cumulative – how different would a place be today if a certain cultural influence had not applied? For the Alps, this brings forward a plethora of questions that to date do not appear to have been addressed in any great detail, or with appropriate rigour.

For the Victorian Alps, there are many questions. Without the adjacent mining towns of Bright & Omeo, and the mining tracks & shanties across the mountains, would the Mt Hotham Ski Resort have developed? Without the local lobbying from Bright and the railway connection, what would Mt Buffalo be like today? Could it have been developed from what would essentially have been a dead-end valley with a small grazing presence? Would high country grazing, on what is essentially just a ‘top-paddock’ (cf the extensive tablelands of the NSW Alps), ever have been undertaken in Victoria without the stocking-rate pressure applied by a large regional mining population? When would the timber industry have developed in the Alps, and how different would its incursion have been without the local demand stimulated by mining and mining populations, the developed settlements from which to base operations, and the established roads on which to transport its products? How and from where would we access the Alps nowadays? How different would our fundamental view and understanding of the Alps be, and how different would our conservation needs and efforts have been?

Similar questions abound for the NSW Alps. While high country grazing had been established before the Kiandra rush, how different would our concept of the Alps be today without the influence of Kiandra and the large adjacent mining populations at Tumut/Adelong, Tumbarumba & Cooma. Without mining-associated settlements at Jindabyne, Adaminaby, etc? Without the thousands of miners and prospectors turning the little-known into the familiar, and the banner newspaper headlines bringing the mountains to the masses with every new find?

All these questions can be answered, and detailed analysis and collection of comparative data would remove them from the realms of speculation. The key to understanding the influence of gold mining is acknowledging what sets it apart from other European cultural (economic) activities in the Alps. Gold was a global commodity, absolutely independent of local, regional and national demand. The other activities were, in historical times, strongly tied to (and limited by) local and regional demand. Mining was the activity that created the local & regional demand, that enabled the other activities to develop and flourish.

Arguments could be raised that the squatting/grazing presence in the NSW Alps directly resulted in the establishment of Kiandra. However, this ignores the evidence provided in goldfields throughout Australia. While discoveries by graziers were common, this relates to their occupation of the land and initial advantage in familiarity with the local area. Goldfields were opened in rapid succession in unsettled areas throughout the continent. The goldfields of the Victorian Alps are a good example. The development of Kiandra was assured (and limited) by the very nature of its deposits, and whether its serendipitous discovery was by shepherds or shortly afterwards by the growing regional army of prospectors, its history would be little different.

F. THE CHAMPION MINE, VIC
(refer section 7.4.2 of the main report)

The Champion Mine (Bogong Unit, ANP) appears to contain the metalwork for a Cornish battery.

The worldwide history of stamp milling of metalliferous ores has perhaps three major periods:

1. An early period dating back thousands of years, in which stamp milling was essentially the use of large mortar & pestles;

99 Refer discussion in "Stamp Milling", Algernon del Mar, 1912, pp1-5.
2. The use of mechanical power to lift the stamps, c. 1300? - 1850. This era was characterised by the use of iron-shod wooden gravity stamps, lifted by pegs inserted into a wooden camshaft. First described in detail by Georgius Agricola in "De re Metallica" in 1556\textsuperscript{100}, these mills remained basically unchanged for 500 years at least, and the Cornish mills of the period (of which the Champion mill is an example) represented the high point of this crushing technology;

3. "Modern" mills. The California gold rushes and the subsequent discovery of large numbers of auriferous quartz reefs placed heavy demands on stamp mills and their efficiency, and the old Cornish technology was rapidly adapted. Principle developments were S-shaped cams, all-iron construction, new shoe design, round heads & stems, adjustable tappets, revolving heads etc. Adaptations produced a plethora of intermediate types, and later a variety of specialised adaptations for particular uses were developed. "Modern" mills of various types are well-represented at historic mining sites throughout the world, including Australia & the Australian Alps National Parks. The Champion mill, however, is the only one of its type known in Victoria, and probably Australia. The rarity of such mills in Australia is due to the fact that by the time widespread reef gold mining got into swing, the modern California-type mills were available. Nonetheless, they were still being advertised by Cornish machinery suppliers into the 1870's\textsuperscript{101}. Several were known to have been installed (eg Port Phillip Company mine, Clunes, Victoria), and others are suspected. It is possible that odd parts such as worn-out shoes or cams may exist unrecognised around such sites.

World-wide, the status of early Cornish mills is difficult to establish. A reasonably intensive though short web-search for the United Kingdom revealed only a single rebuilt unit in Cornwall (through museums of technology, historic mining sites & tourism literature, historical associations etc). Elsewhere, the only success was a single, distinctive, square, long-tanged, Cornish battery shoe located at a mining museum in Michigan, USA\textsuperscript{102}. It is presumed but certainly not proven that despite their original worldwide distribution, extant units are extremely rare.

\textit{It should be stressed that any high technological value that may attach to the Champion mill is not because it is a rare or unique type of battery (and of course it is rare to find any two identical batteries). Rather, it is because it represents a once-common class of crushing machine that was the global highpoint of mining crushing technology for at least half a millennium, but now appears to be extremely rare.}

Any significance would be diminished by the battery not being at a site belonging to the era of this technology's dominance (ie pre-1850). Alternatively, it could be argued that because mining in Australia principally post-dates the era of this class of machine, and these mills did not play a significant role in Australian mining, then Australian values are not indicated. At the same time, the technological values would be outstanding at a universal level provided that worldwide extreme rarity could be demonstrated. It is beyond the resources of this project to definitively establish the level of significance of this site.

\textsuperscript{100} Translated from Latin into English by Herbert Hoover, 1912.
\textsuperscript{101} Eg Williams' Perran Foundry Co, Cornwall - catalogue c.1870.
\textsuperscript{102} Refer www.clk.k12.mi.us/chs/history/apenglish/cliffINS/1850.html for photo of shoe.