

Appendix 3

Rehabilitation Plan Proforma and Checklist

Numbers in this text style refer to relevant sections of the *Guidelines*.

1. **NAME OF SITE:** _____

2. **LOCATION:** _____

3. **DATE OF PREPARATION:** _____

4. **PREPARED BY (name):** _____

5. **PRE-DEVELOPMENT PLANNING** (section B.3.1)

5.1 Has a site assessment been completed?

Detail reference and where to acquire document (section B.2 & Appendix 2)

5.2 Has a Site Environmental Management Plan (SEMP) been completed?

Detail reference and where to acquire document (section B.3.1.3)

5.3 Describe the aim/objective of the rehabilitation: (section B.3.1.2)

5.4 Detail staging of rehabilitation, including sequencing and timing of major events:

(section B.3.1.5) _____

5.5 Source of Material for Rehabilitation

5.5.1 List plants required for rehabilitation (section B.3.1.4)

Species	Sowing/Planting Rate	Quantity Required	Supplier	Collection/other details

5.5.2 List other materials required for rehabilitation (section B.3.3.1)

Include mulch, landscaping materials, tools, fencing etc.

Item	Quantity Required	Supplier	Collection/other details

5.6 Staff and Induction Matters (section B.3.1.6)

5.6.1 List human resources required for rehabilitation, their role and training requirements/experience:

Position	Role	Number of people	Training Requirements

5.6.2 Note matters that will covered during site induction for all people entering the site:

6. PROTECTION OF RESOURCES AND VALUES DURING DEVELOPMENT (s B.3.2)

6.1 Weed Management (section B.3.2.1)

**6.1.1 Does the site contain weeds that need to be managed prior to the works?
If so, describe what species are present and how they will be managed:**

6.1.2 Describe measures that will be taken during the works to minimise potential for the transport of weeds or pathogens:

6.2 Protection of Natural and Cultural Values (section B.3.2.2)

6.2.1 What natural/cultural values need to be protected at the site?

6.2.2 How will these values be protected?

6.3 Designated access and stockpiling arrangements (section B.3.2.3 & B.3.2.4)

If no SEMP has been prepared, or the SEMP does not adequately cover rehabilitation stage arrangements including stockpiling and access, attach a sketch of the site showing designated access and stockpile areas.

6.4 Earthworks (section B.3.2.5)

Detail any earthworks required for Rehabilitation or attach plans that show these works.

6.5 Waste Management (section B.3.2.6)

Detail all waste that will be produced during rehabilitation and how it will be managed.

7. REHABILITATION (section B.3.3)

7.1 Extent of rehabilitation area (section B.3.3.2)

Attach a map/sketch of the site showing all areas requiring rehabilitation, proposed treatments and where sediment and erosion controls would be located (or refer to SEMP).

7.2 Site Preparation and Protection of Soils (section B.3.3.3)

7.2.1 How will the site be prepared for planting?

7.2.2 How will sediment and erosion controls be maintained?

Note who is responsible for maintenance and how often routine checks will take place.

7.2.3 How will bare ground be protected?

Include contingencies for extreme weather conditions/emergencies.

7.2.4 What sort of mulch will be used?

Describe how the mulch is to be handled to ensure that it remains in place, and measures that will be taken to ensure that the mulch does not contribute to the introduction of weeds. Include a sketch if necessary

7.3 Planting (section B.3.3.4)

7.3.1 Layout and density of planting

Attach a map/sketch of the site showing where different species will be planted and indicating the density of planting (may be included in 6.1)

7.3.2 Use of Fertilisers

Will fertilizers be required? If so, detail what sort and how they will be applied.

7.4 Protection of the site (section B.3.3.5)

Detail how the site will be protected from grazing or other disturbance (wind, frost etc.) once planting has been completed.

8. POST- REHABILITATION (section B.3.4)

8.1 Maintenance of Rehabilitation (section B.3.4.1)

8.1.1 Who is responsible for maintaining the site?

8.1.2 Maintenance tasks and frequency

Detail what will be checked during maintenance visits, required actions and frequency of visits

Task	Frequency

8.1.3 How long will maintenance be continued? _____

8.2 Monitoring (section B.3.4.2)

8.2.1 Monitoring tasks and frequency

Detail monitoring technique(s) used, responsibility and monitoring interval (frequency)

Task	Responsibility	Frequency

8.3 Auditing (section B.3.4.3)

8.3.1 Will the rehabilitation work be audited on completion? Yes No (circle)

8.3.2 Who is responsible for auditing? _____

8.4 Site Handover (section B.3.4.4)

8.4.1 Will handover be required? Yes No (circle)

8.4.2 Who will the site be handed-over to?

8.4.2 When will handover occur?

8.4.2 Detail matters that need to be considered in handover

Checklist

Does your Rehabilitation Plan contain the following essentials?

- Has a site assessment been completed and consulted? Yes No (circle/strike out)
- Has a SEMP been completed and consulted? Yes No
- Are aims/objectives of rehabilitation stated? Yes No
- Is staging detailed, including sequencing and timing of main activities? Yes No
- Are details of required site preparation included, i.e.;

 - Weed management Yes No
 - Designated storage, access and protection areas Yes No
 - Earthworks (ripping, shaping and grading, drainage) Yes No
 - Waste removal Yes No

- Are all required materials and equipment detailed and sourced, including;

 - Fill, soil, compost Yes No
 - Plants/seed Yes No
 - Mulch/matting/mesh Yes No
 - Fertilizer/water saving granules Yes No
 - Plant protection Yes No
 - Earthmoving/ripping/shaping/drainage/auguring equipment Yes No
 - Hand tools Yes No
 - Water supply Yes No
 - Storage for equipment/materials/water supplies Yes No

- Is maintenance detailed? Yes No
- Is monitoring detailed? Yes No
- Are handover provisions detailed? Yes No

Sample Rehabilitation Plan

REHABILITATION PLAN – HOTHAM CHALET

Lot 1 Higgi Drive, Mt Hotham Alpine Resort - November 2004

1 PRE-DEVELOPMENT PLANNING

1.1 Existing Documentation

A Site Assessment has been prepared for this project: SITE ASSESSMENT - HOTHAM CHALET, November 2004, located in Appendix 2

A SEMP has been prepared: XXX NAME & LOCATION XXX

1.2 Aims of Rehabilitation

Rehabilitation of this prominent site within Mt Hotham Village, will aim to use indigenous alpine species, while also creating an attractive landscape feature. The type of community appropriate to this site is a short alpine herbfield to the front and sides of the building, and a closed heath design on the small slope at the rear of the site. These will create an attractive feature as well as achieving effective rehabilitation of the site. The following photographs will give some idea as to what can be represented.

Figure A Short Alpine Herbfield – Bogong High Plains



Figure B Alpine Heathland – Mt Hotham



The site is located adjacent to Hotham Chalet, therefore it is important that it is rehabilitated in a way that will not contribute to a bushfire hazard. The use of low growing alpine species and grasses, which can be mown to maintain a low height and fuel loading close to the chalet, is appropriate for this site.

1.3 Staging

Redevelopment of the Hotham Chalet will not be completed before early April 2004. The rehabilitation needs to be completed by late April. The planting of tubestock in high altitude areas after April will often fail due to low soil temperatures. This site could be planted during spring as long as the soil is well protected over the winter and early spring period.

Maintenance will be carried out for at least 2 years from the completion of rehabilitation.

1.4 Sourcing of Plant Material

The tubestock used in this project needs to be grown from plant material that has been sourced from the Mt Hotham area. It needs to be grown by a reputable indigenous alpine plant producer and be of sufficient size and quality to successfully establish. A supplier should be contacted as soon as possible to allow time for material for propagation to be collected and cultivated. A list of potential supplies is provided below:

XXXXXXXXX LIST DELETED FOR USE IN THIS EXAMPLE XXXXXXXXX

All plants need to be grown in at least 7.5 cm pots with sufficient root and shoot growth. Plants that are small, diseased or pot bound will not succeed when planted in an alpine landscape. Plants in this size pot are recommended as they are physiologically dynamic, small enough to plant, but large enough to cope with transplant shock.

Recommended Species:

Forbs

- *Bracteantha subundulata* – Orange Everlasting
- *Celmisia pugioniformis* - Dagger Leaf Snow Daisy
- *Craspedia lamicola* – Billy Buttons
- *Craspedia maxgreyii* - Grey Leaf Craspedia
- *Cotula alpina* - Alpine Cotula
- *Helichrysum rutidolepis* - Pale Everlasting
- *Microseris lanceolata* - Native Dandelion
- *Leptorhynchus squamatus* – Scaly Buttons
- *Podolepis robusta* – Alpine Podolepis
- *Scleranthus biflorus* - Two flowered Knawel
- *Senecio pinnatifolius* – Alpine Groundsel
- *Stelleria pungens* - Prickly Starwort

Grasses

- *Poa fawcettiae* - Snow Grass
- *Poa hiemata* - Soft Snow Grass
- *Poa hothamensis* - Ledge Grass

Shrubs

- *Grevillea australis* – Alpine Grevillea
- *Grevillea victoriae* – Royal Grevillea
- *Hovea montana* – Rusty Pods
- *Olearia frostii* - Alpine Daisy Bush
- *Olearia phloggopappa* var. *flavescens* - Dusty Daisy Bush
- *Podocarpus lawrencei* - Mountain Plum Pine
- *Prostanthera cuneata* - Alpine Mint Bush
- *Tasmania xerophila* - Alpine Pepper Bush

1.5 Other Material and Equipment Required

Other material and equipment required includes:

- Rakes, spades and trowels – three of each to be provided by contractor.
- XX bales of mulch, 1 roll each Jute mesh and geotextile, XX mesh anchoring pins, XXkg Osmacote, XX kg Dynamic Lifter – sourced from XXX.
- Electric fencing materials – sourced from XXX if there is evidence of grazing after planting completed.
- Water will be provided by existing hoses from the exterior of Hotham Chalet.

1.6 Human Resources

Table A details the roles and responsibilities of the works crew and project managers.

Table A Project Roles and Responsibilities

Task	Project Manager	Works Crew	Project Auditor
Oversee rehabilitation project; ensure that all works are completed as detailed in the Rehabilitation Plan.	Y		
Source seed and tubestock.	Y		
Quality control rehabilitation materials including plant stock.	Y		
Induct works crew.	Y		
Maintain erosion and sediment controls as per SEMP.		Y	
Prepare site for planting, including weed control.		Y	
Undertake planting.		Y	
Carry out follow-up maintenance including watering, weed control and maintenance of mulch and plant protection.		Y	
Replace failed plants if necessary.		Y	
Oversee ongoing maintenance and monitoring, including collecting and filing site information.	Y		
Audit rehabilitation 3 months after completion.			Y
Provide audit results to project manager.			Y
Act on audit outcomes.	Y		

1.7 Induction of Staff and Contractors

Prior to commencing work on the site, all staff and contractors must participate in induction. This will be co-ordinated by the Project Manager. Induction should include a discussion of all issues detailed in this Rehabilitation Plan.

2 PROTECTION OF RESOURCES AND VALUES DURING DEVELOPMENT

2.1 Weed Management

Prior to any rehabilitation of the surrounds of the Hotham Chalet site, the weeds must be managed. For successful establishment of indigenous alpine tubestock, weeds must be sprayed and/or removed. This should be carried out prior to construction on areas of the site where the soil will be removed, however, where the soil is not disturbed, it is recommended that weed control should be held back until the rehabilitation process can begin. This is because the weeds will offer some protection to the soil during construction. Care will need to be taken, however, to avoid spreading the weeds from this area back onto the site. Location of stockpiles in un-treated areas should be avoided.

When the new development is near to completion, then the site can be sprayed with herbicide. It is of particular importance to eradicate the *Achillea* and *Agrostis* species as these genera are highly rhizomatous and will colonise well after disturbance. A combination of glyphosate (e.g. Roundup™) and a wide spectrum broad leaf herbicide (such as Banvel™ or Amicide™) will give the best result for weed removal on this site.

2.2 Protection of Natural and Cultural Values

Recommended locations for erosion and sediment controls are designated in the project SEMP. Once the footprint of the new development has been established, access pathways have been designated and weeds have been controlled, then any remaining areas of bare soil should be mulched. Weed free straw is the recommended mulch for this site.

2.3 Designated Access

Vehicular access to the site should be confined to existing roads, including the drive way and carpark shown on the attached site plan, figure C.

Pedestrian access to all parts of the site to allow rehabilitation work to be completed is acceptable, however, preference should be given to walking over gravel or other hardened areas where this is possible. This will help to protect the soil from compaction.

After the work has been completed, pedestrian access should be confined to defined pathways.

2.4 Designated Stockpile/Storage Areas

Soil, mulch, plant stock and other materials should be stockpiled in the carpark area, shown on the attached site plan, figure C.

2.5 Earthworks

The extent and type of earthworks required are detailed in the construction plans, XXXLOCATIONXXX.

2.6 Waste Management

All soil will be reused on the site. No woody weeds require removal.

No rubbish is to be disposed of on site. All planting/construction waste is to be deposited in the rubbish skips located on site for removal to XX Waste Transfer Station.

3 REHABILITATION

3.1 Extent of Rehabilitation Area

The area to be rehabilitated is shown on the attached site plan, figure C. All disturbance must be confined to this area and designated access and stockpiling areas.

3.2 Site Preparation and Protection of Soils

3.2.1 Site Preparation

Prior to planting, the following steps are to be taken to prepare the site :

- Weeds are to be controlled:
- The site should be cultivated to break up compacted soil, particularly in areas that have been subject to regular vehicular and/or pedestrian traffic.
- Measures to improve drainage should be installed in wet areas, particularly the flat area at the back of the Chalet.
- Mulch should be spread over the site to protect the soil.

3.2.2 Maintenance of Erosion and Sediment Controls

All erosion and sediment controls should be regularly inspected to ensure that they are in effective working condition. Inspections should particularly be carried out after heavy rain or storms so that sediment traps can be cleared if necessary and damaged barriers can be repaired or replaced.

3.2.3 Management of Bare Ground

Once weeds have been eradicated, then all bare soil areas must be mulched as soon as possible. It is of particular importance, even if the site is not planted before the winter, that the area is mulched.

3.2.4 Mulch

Mulch will protect the soil from erosive processes, inhibit weed seed germination and will help improve the soil for planting in the following spring. If the site can be planted before the winter, it must be planted prior to April 30th as, after this time, the soil is liable to freeze and planted seedlings will not be able to establish.

3.2.5 Contingencies for Weather Conditions

Geotextile or sediment control fabric may be used for temporary protection of areas of bare ground, and stockpiles if required however, over the long term, the use of mulch is preferred as this helps to maintain soil health and fertility, whereas long-term use of geotextile may be messy and inhibit natural processes.

3.3 Planting Requirements

3.3.1 Layout and Density of Planting

To have a dramatic landscape effect, the flowering species need to be mass planted. The desired effect would be to have swathes of the same species planted in an area which merge into another species of a slightly different shade or height. The flowering species can be inter-planted with either Snow Grass or Soft Snow Grass. In time, the grasses will provide mulch to the planted areas and will soften the effect of the many flowering plants. A planting density of 5 to 7 seedlings per square metre of a mixture of grasses and forbs is required to achieve an immediate landscape effect.

Please refer to the landscape plan for the layout (Figure C).

The rear slope that peters down to a flat area needs to be heavily planted with shrubs to rehabilitate the slope. A combination of the shrub species listed is recommended for the sloped area. This can merge down into grasses on the flat section to the rear of the site. The grass species, *Poa fawcettiae* (Snow Grass) and *Poa hothamensis* (Ledge Grass) would be suitable. Shrub species should be planted at 3 plants per square metre and grasses at 5 plants per square metre.

As the area around Hotham Chalet will be accessed in non-snow times, it is important that properly constructed pathways are installed as part of the landscape design. 'Soft' paving materials are recommended, such as 'Lilydale' toppings or fine scoria rock. These can be rolled and compacted so that they are stable. These types of paving materials are more suited to an alpine area than a hard paving surface such as bricks because of frost heave. Soft pavers cope better with soil movement than hard pavers. The edge of the pathways should be contained using close growing vegetation. Using a definite edge looks harsh, is difficult to keep neat and will probably not stay defined after a winter. A mixture of *Poa* and forb species (particularly *Cotula alpina* and *Helichrysum rutidolepis*) are suitable for this purpose.

3.3.2 Fertilizer

As this site will have a proportion of its topsoil removed, it is recommended that a nutritional planting additive be used in the planting holes for each seedling. This will improve initial establishment and promote vigorous plant growth. Slow release fertilisers, such as Dynamic Lifter and 9 month – Osmocote, mixed in with the planting soil is recommended.

3.4 Protection of Rehabilitation

Initial monitoring is required. Once the site has been planted out, should there be evidence of grazing a low, two strand 12 volt electric fence will be used to protect the seedlings. This fencing would be maintained until plants are well established.

4 POST REHABILITATION

4.1 Maintenance of Rehabilitation

Once the rehabilitation/landscaping of Hotham Chalet site has been completed, it is important that the work is maintained. It is inevitable that some level of mortality will occur with the planted seedlings. Follow-up work should include:

- Regular watering during dry periods;
- A replacement planting follow-up program, about a year after the initial planting;
- Follow-up weed control; if invasive weeds such as Milfoil are allowed to re-establish the landscape work will fail. Weed species can be sprayed with herbicide if not too near the planted seedlings, but otherwise, they will need to be hand removed. After a few years of diligent maintenance, native plants should be able to out-compete the weed species and this area can become a relatively sustainable landscape that is sympathetic to its surrounds.
- Re-mulching of any bare areas is also recommended on an annual basis.

4.2 Monitoring of Rehabilitation

Since the site would be planted in April, it is recommended that monitoring of the site is carried out within one week of planting, and thereafter, on an annual basis. This will ensure that, if required, follow-up work will be identified and completed, and the long term success of the rehabilitation work will be better assured.

4.3 Auditing

It is recommended that the Management of Hotham Chalet audit the rehabilitation work twice: once on completion of the initial planting and mulching, and a second time one year later, to ensure that follow-up work has been adequately completed.

If the rehabilitation of the site is inadequate then a contingency plan needs to be provided to resort management. Failure to effectively rehabilitate may contravene lease compliance.

4.4 Handover

Site handover will take place once planting is completed. Hotham Chalet management will be responsible for maintenance and monitoring. They will be made aware of the relevant requirements of this Rehabilitation Plan.

Photos in this section courtesy E. MacPhee.

Figure C Site plan



