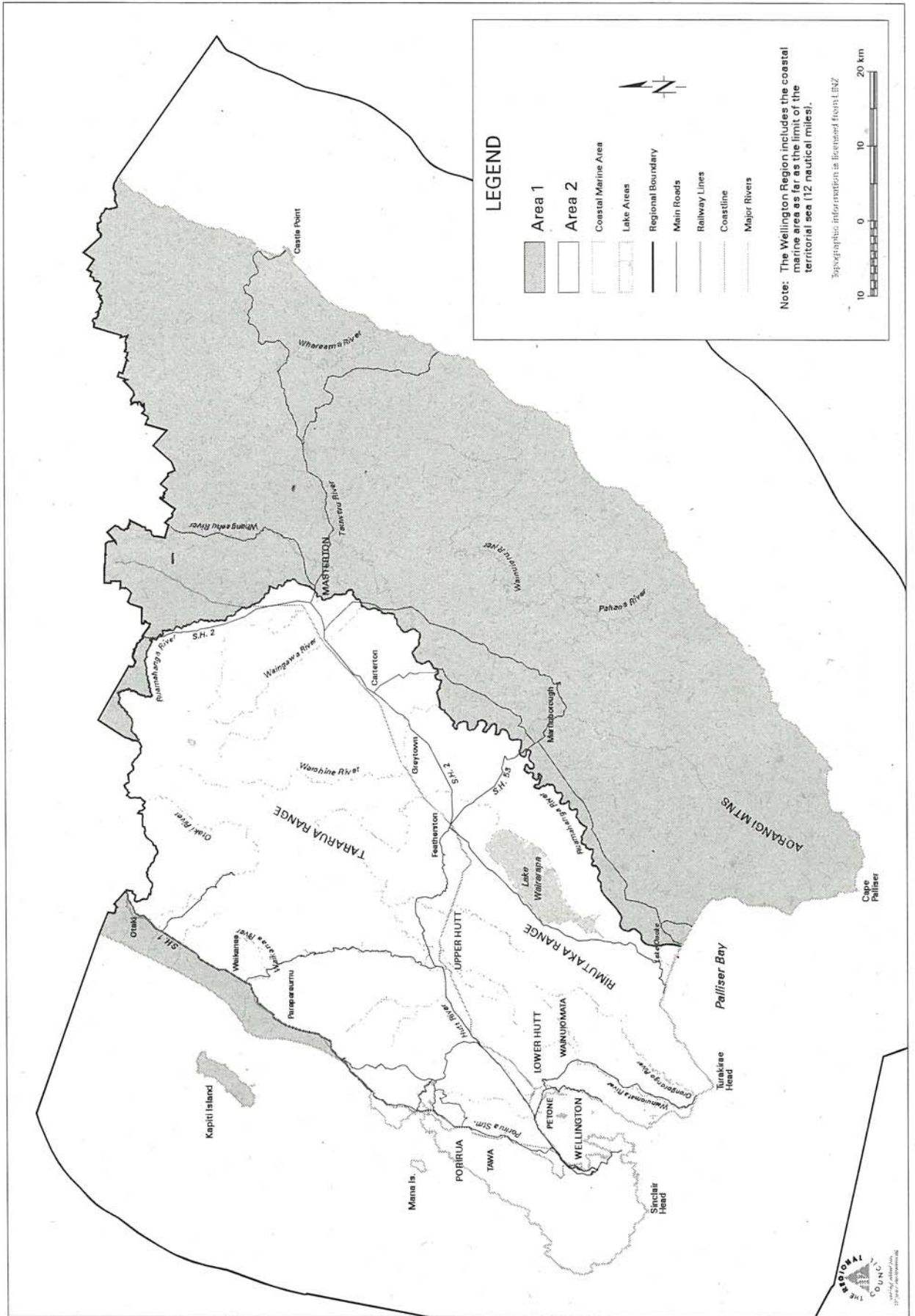
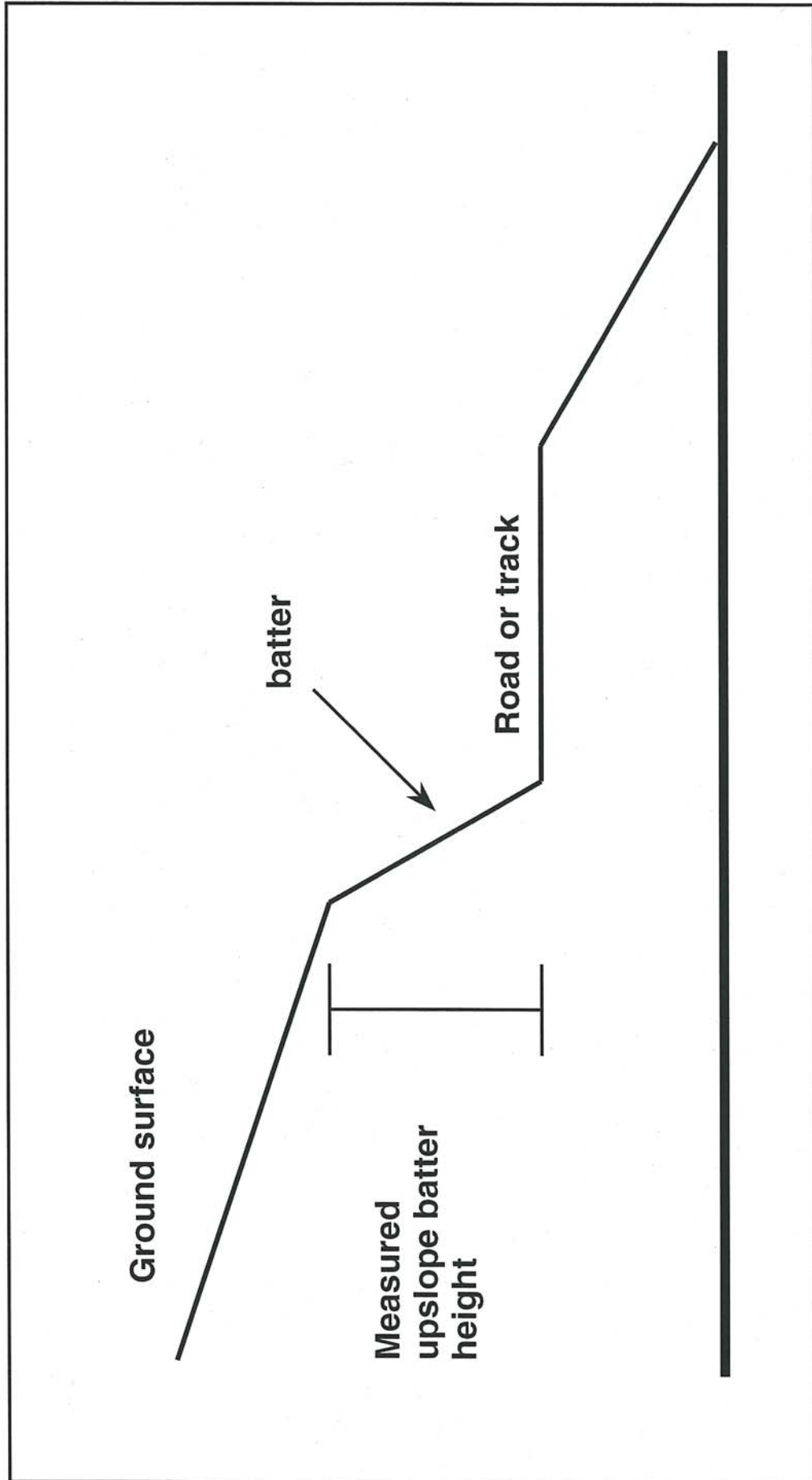


**Appendix 1
Regional Soil Plan Areas 1 and 2**



Appendix 2 Upslope Batter Height for Roading and Tracking Activities



Appendix 3

Guidelines for Topsoil Mining

(Based on the recommendations in Chapter 5 of Hart, August & Watts (1990) "Topsoil mining in the Wellington Region: Background issues, agronomic and cost/benefit studies on an upland soil, and rehabilitation guidelines for the Region").

1. Objectives

Topsoil mining should be undertaken within the following two objectives:

- (a) Mining of topsoil should not compromise the versatility of the soil resource.
- (b) Where topsoil mining is allowed, land should be rehabilitated to a state that ensures its long-term sustainability for plant growth.

2. Management Plans

Topsoil mining should be undertaken only after the preparation of detailed site operation and rehabilitation plans. Each of the plans should cover a period of five years from the initial date of actual topsoil removal.

These plans would provide for the minimum work necessary to restore pasture production, to minimise erosion and to protect off-site areas at risk from siltation of water bodies, sand and silt deposits and nutrient enrichment. Such plans need to have the full support of the landowner.

The management plan duration also provides for a reasonable period for councils to maintain liaison with the applicant, monitor the progress of the topsoil removal and restoration operations, agree to modification to the plans should site conditions or other circumstances dictate such change and ensure that restoration standards are met.

2.1 Operational Plans

The operational plans should contain the following conditions:

- (a) The maximum extent of bare ground resulting from topsoil mining operations should not exceed two hectares at any one time.
- (b) The turf layer (which could include up to 5cm of topsoil) should be first removed and stockpiled for re-spreading during the rehabilitation phase.

- (c) Topsoil mining should cease during very dry periods when lighter soils may be blown away.
- (d) Topsoil mining should cease during high rainfall periods when compaction of soils and loss of sediment and nutrients into waterways may occur.
- (e) Topsoil mining operations should be completed not later than a specified date and that re-grassing and other restoration operations will commence on or before that date.
- (f) Scrub and debris from the operation should not be pushed into gullies and watercourses, but should be windrowed around the edges of the topsoil mined areas to minimise sediment and nutrient run-off.
- (g) Topsoil stockpiles should be located away from water bodies to avoid soil loss into channels during periods of heavy rainfall or strong winds.
- (h) Silt traps should be installed for all water generated from the site.

2.2 Rehabilitation Plans

The planning for rehabilitation needs to be practical and should also be structured to involve consultation between all parties. The relevant parties may include the Regional Council, district councils, land owners and the mining operator.

The rehabilitation plans should take into account the following:

- (a) The topsoil mined land (including any silt traps) should be managed in accordance with the aim of developing and maintaining a new topsoil supporting a healthy and vigorous pasture free of weeds at least as good as that previous to topsoil mining.
- (b) Soil compaction should be relieved by subsoiling or other (specified) cultivation methods (if appropriate to the site).
- (c) Drainage systems should be installed (if appropriate to the site).
- (d) The stockpiled turf layer should be re-spread over the topsoil mined land.
- (f) The topsoil mined land should be initially sown with a suitable grass/clover based pasture mix. Clovers should be inoculated with rhizobium bacteria. (This is probably unnecessary if the stockpiled turf layer is re-spread over topsoil mined land.)

Management plans will vary according to site conditions and would need to cover in detail; methods of subsoiling, cultivation, soil fertility testing and pasture management. After an initial period of pasture the land could be put to an alternative use with the agreement of all parties.

Responsibilities for the management of rehabilitated land over succeeding months / years needs to be clarified between the land owners and topsoil miners. A major point to decide is when the topsoil miner is released from his / her obligations. It is recommended that topsoil miners retain some responsibility for the supervision of restored land for the first year after sowing. This will allow for sufficient time to elapse before determining that pasture establishment is properly achieved and that the initial level of productivity is satisfactory.