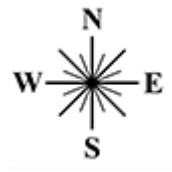


Central Darling Shire Council



Draft Tilpa Waste Facility Long Term Plan of Management



Robert Bailey Consulting
Unit 408 12-24 William Street
Port Macquarie, NSW 2444
Phone 0448737383

Table of Contents

Contents

Table of Contents.....	2
1.0 Overview	3
2.0 Background	3
3.0 Purpose	4
4.0 Operations.....	5
5.0 Landform Concept Design.....	6
6.0 Acts and Policies Associated with the Project.....	6
7.0 Delivery	7
9.0 Appendices	9
Appendix 1- Notes to Accompany Design Drawings.....	9
Appendix 2 – Design Concept Figures 1 to 6	13
Appendix 3 - Aerial Location Plan	19
Appendix 4 – Waste Placement Technique	20

1.0 Overview

The Tilpa Waste Facility is described as Lot 6881 DP 48661 Crown Reserve, is located about two kilometres from the village of Tilpa off the Wilcannia to Bourke Road and serves a district population of around 40 residents. It is a small landfill and utilises a trench and fill method for waste disposal. The facility occupies around half of one hectare of land and has been in operation for a number of years.

The site is not supervised, that is, there is no Council presence to oversee the operation of the facility nor is the site controlled, that is, there are no gates that can be shut to limit access to defined times. This is understandable given the small population and limited quantity of materials being received. Nonetheless, Council has an obligation to operate the waste facility in accordance with the POEO (Waste) Regulations 2014.

There is a service road about the perimeter of the disposal trench where facility users can deposit their waste into the excavation. There are no means of controlling the spread of the deposited waste within the excavation. A three metre high litter fence has been established along the boundary lines and is effective in intercepting windblown litter.

Geotechnical engineer, Robert Amaral, has provided concept designs and notes (see Appendices 1 and 2) that demonstrate how deposited waste is to be pushed up to one end of the excavation and progressively capped as the final landform is developed. Such work on the landfill will be undertaken when suitable plant is available and could be at intervals exceeding six months. The covering of putrescible waste can be undertaken on a regular basis by a local landholder using a tractor and blade

. When the current void has reached capacity and final shape attained, three additional trenches can be excavated within the existing landfill boundaries as described in Appendix 2, figures 1 and 6. The completed stages 1, 2 and 3 of the existing excavation can then be capped and excess overburden from the trench excavations stockpiled for use as cover material and final capping of the additional trenches. Appendices 1 and 2 provide details of the proposed works. Although many years into the future, when the three additional trenches have been filled and capped, a new landfill can be developed on land immediately adjacent to the current landfill

2.0 Background

Central Darling Shire Council has determined to undertake a review of the operations of its waste facilities in order to identify how the residual life of its landfills can be maximised, how improvements to current practices could be introduced, where efficiencies may be gained and risks mitigated. Council's aim is to achieve sustainable management of the Tilpa waste facility that is commensurate with available resources and obligations set out in the POEO (Waste) Regulations 2014.

Council has prepared a scope of works and engaged Robert Bailey Consulting and Robert Amaral Geotechnical (Landfill) Engineer to prepare a long term plan of management for the

Tilpa Waste Facility that will provide a final landform design, filling/staging plans, has identified where future trenching can be undertaken and established procedures to improve operational performance and to mitigate risks.

3.0 Purpose

The purpose of this Long Term Plan of Management (LTPoM) is to provide a process with the highest probability of achieving the defined project aims. The LTPoM would address long term planning and the future design of the Tilpa Waste Facility in considering the final landform, progression to a new trench excavations, existing and future infrastructure, plant utilisation, complying with the EPA Environment Guidelines: Solid Waste Landfills (2nd edition 2016), valuing responsible environmental performance, improving existing landfill management practices and recognising resource recovery opportunities.

The primary aims of the project are:

- To put measures in place that will maximise the residual life of the landfill
- To identify improvements to existing practices that will translate into cost efficiencies and provide for the realisation of these opportunities.
- To develop plans for the coordinated development of the facility over the longer term.
- To engage practices that will ensure responsible environmental performance is achieved
- To comply with the requirements of the EPA Environment Guidelines: Solid Waste Landfills (2nd edition 2016) together with other relevant legislation, regulations and codes where applicable
- To address risk
- To contribute to the development of an overarching strategic plan for Council's waste facilities including the preparation of a financial model that will predict future incomes and expenditures and will provide for the managed development of the waste facilities over the longer term.

4.0 Operations

- 4.1 **Current operations for the general waste active tipping area** – general waste, which is self haul (Council does not provide a kerbside collection service), is deposited at the edge of the excavation and there are no measures in place to contain the size of the active tipping area. The site is not supervised, therefore signage is the principal means of controlling the disposal area. The waste material is pushed up whenever suitable plant is available. Windblown litter is not an issue given the high mesh fencing that has been established around the perimeter of the site and is in close proximity to the excavation. The shape of the service road that encircles the excavation is directed towards the landfill and may cause water (leachate) to pond within the excavation after storm events. This can be corrected as the final landform develops
- 4.2 **Proposed improvements to the operation of the general waste tipping area** – Geotechnical engineer Robert Amaral has prepared concept designs for the future operation of the current general waste disposal area that provides for the progressive pushing up of deposited waste to one end of the excavation, achieving the design shape and then capping with ENM (excavated natural material). This procedure will be undertaken as three stages until the present excavation is completed filled. Locations within the current site have been identified where three additional trenches can be excavated for future landfilling. Cover material and capping can be provided from the future trench excavations. (see Appendices 1 and 2).
- 4.3 **Existing landfill plant** – whatever suitable plant is available when road works are being undertaken in the local area
- 4.4 **Proposed improvement to landfill plant utilisation**– a local landholder to be engaged to push up and cover putrescibles waste on a regular basis using a tractor with a blade and continue to use larger plant when available.
- 4.5 **Current site control and supervision** – the site is not supervised that is, there is no Council presence to oversee the operation of the facility nor is the site controlled, that is gates are not provided to limit access to defined times.
- 4.6 **Proposed improvement to site control and supervision** – no changes are proposed to site control and supervision given the small population being served by the landfill.
- 4.7 **Current green waste management** – green waste is not being separated, and is being landfilled.
- 4.8 **Proposed improvements to green waste management** – no changes are proposed to the current means of green waste management

- 4.9 Current scrap metal management** – scrap metal is not being separated and is being landfilled. No changes are proposed to the current procedure.
- 4.10 Current and proposed waste concrete management** – waste concrete is currently being landfilled and no changes are proposed.
- 4.11 Deceased animals and asbestos disposal-** deceased animals or asbestos are not accepted at the landfill and no change is proposed to this position.
- 4.12 Litter-** litter fences have been established about the perimeter of the site and are effective in controlling windblown litter. The fencing is about 3.0 metres high. No changes are proposed.
- 4.13 Recycling** – there is the potential to recover drink bottles and cans from the landfill that fall within the Container Deposit Scheme (CDS) and may be taken to the Return and Earn facility at Wilcannia. Council may be able to facilitate this as a community endeavour.

5.0 Landform Concept Design

Final landform design and filling/staging plans have been prepared for the future development of the Tilpa waste facility and these appear as –

- Notes to Accompany Design Drawings in Appendix 1,
- Concept Designs in Appendix 2 and

These documents offer information on the progressive filling of the current excavation until the final landform is established and provides the location and design of additional trenching

6.0 Acts and Policies Associated with the Project

- Protection of the Environment Operations Act 1997
- Protection of the Environment Operations (Waste) Regulation 2014
- EPA Environmental Guidelines: Solid Waste Landfills (2nd edition 2016)
- Environmental Planning and Assessment Act 1979
- Environmental Planning and Assessment Regulation 2000
- Infrastructure SEPP 2007

7.0 Delivery

Desired Outcomes – the Tilpa waste facility will be developed in a planned and co-ordinated manner.

- The project will deliver the stated aims
- Risk will be managed
- Regulatory agencies gain confidence in Council's management processes
- Succession planning is achieved
- Landfill void space will be maximised
- Residual life of the landfill will be optimised
- Long term planning prevents re-work resulting in corresponding savings
- Budgets can be developed for the capital works and programmed for delivery in a measured way and for optimum benefit

Key Actions to deliver the desired outcomes

Milestone 1 – Progressively push up and cap the deposited waste material until the final landform is achieved and capping can be applied (Appendix 2, figures 3, 4 and 5)

Key Tasks

- When suitable plant is available, push all deposited waste to one end of the excavation over three stages until the designed landform shape is achieved.
- Win capping from existing on-site material or from the locations of the future trench excavations (progressively) and place and compact the capping in accordance with the Amaral concept designs (Appendix 2, figures 3, 4 and 5)

Milestone 2 – prepare for the next trench and undertake the excavation

- Prepare future trenches as (Amaral) stages 4, 5 and 6.
- Stockpile excessive overburden for use as cover material and capping for the additional trenches
- undertake landfilling in the new excavation as proposed in Appendix 4

Cost Estimates - Figures provided below for the likely cost of works required to achieve the milestones are cost estimates only and may well vary depending on a range of circumstances. The purpose of the estimates is to provide inputs for the financial model that

has been developed in the overarching Strategic Plan. The Strategic Plan has been prepared to provide a roadmap for the future management of all of Council's waste facilities.

Milestone 1

Progressively push up and cap the deposited waste material over three stages until the final landform is achieved and capping can be applied

Year 1 \$5,000 (capital cost)

Year 2 \$5,000

Year 3 \$5,000

Year 4 \$5,000

Milestone 2

Prepare for the next trench and undertake the excavation Continue landfilling

Year 5 \$15,000

Year 6 \$5,000

Year 7 \$6,000

Year 8 \$6,000

Year 9 \$6,000

9.0 Appendices

Appendix 1- Notes to Accompany Design Drawings

NOTES FOR INCLUSION WITH LANDFILL DESIGN DRAWINGS

20205t

GENERAL

There are a number of issues/circumstances which have an impact on the design of the Tilpa Landfill as discussed in detail in the main text of this LTPoM:

- * very small size of the waste source community
- * remote location
- * unlimited access to an unmanned site
- * limited access to purpose built landfill equipment
- * advantageous low permeability geologic soil profile
- * advantageous evaporation to rainfall ratio (at least 6:1)

Some of these issues have no ready solution due to cost restraints.

The following design details attempt to take account of these issues and do not always follow the NSW EPA Guidelines for Landfills but can be technically supported/defended because of the advantageous geological nature of the site and its very favourable climatic environment.

In particular, the usual major environmental issue for landfills is the generation and potential movement off site of leachate which, at Tilpa, is essentially non-existent.

FIGURE 1 SITE PLAN FROM GOOGLE EARTH

This figure provides an adequate layout of the existing site and the adjoining soil windrow which is understood to have a core of waste material.

The approximate plan area of the site is about 70m x25m.

FIGURE 2 SCHEMATIC SITE PLAN

Figure 2 is a schematic plan of the site showing its main features: an encircling soil bund/levee which is about 1.5 to 2m above the surrounding ground surface, a central dish shaped area into which waste is placed and a scattering of waste concentrated mainly towards its eastern end.

Access is by means of a well graded track which runs around the perimeter of the landfilling area.

FIGURE 3 STAGE 1 FILLING PLAN

The Stage 1 filling plan consists of collecting all of the existing waste located within the dish shaped filling area and concentrating it into the eastern one third or so of the site.

Most of the existing waste is composed of metal and other non-combustible material, the residue of many previous fires.

The majority of this material is small enough to be picked up in a front end loader (FEL) or bobcat bucket and placed in the eastern end of the site.

If placed at the edge of the limited eastern end of the site it should be able to be pushed towards the centre of the filling area, mixed with soil/concrete/other hard material to allow the FEL, bobcat or other small equipment to ride over the waste and extend the waste face into the centre of the filling area.

Once all the loose waste has been moved into or adjacent to the Stage 1 filling area it may be necessary to import a steel tracked piece of equipment (dozer, traxcavator, excavator or the like) to ride over the waste to provide a shaped platform over which a 600mm cover of soil can be placed.

In order for this work to be achieved using an FEL alone, additional soil will need to be used to allow the waste to be pushed up and trafficked.

With the discontinuance of waste burning the rate of landfilling will increase and there will be more “soft” waste such as paper/cardboard and the like to co-mingle with the balance of the harder waste, possibly allowing the lighter equipment to ride over the waste surface with the use of more soil.

It will also be the case that unburnt putrescible waste will need to be covered more regularly to control flies, rodent, birds and litter.

FIGURE 4 STAGE 2 FILLING PLAN

This figure illustrates the completion of the Stage 2 filling program.

As far as is practicable, all future incoming waste should be placed and pushed into this Stage 2 area.

During this filling period, the locally available farm tractor should be used to push waste towards the middle of this area.

It would be preferable to block access to the eastern third of the site to help concentrate all waste into the designated area.

All on-site trees should be removed, cut up and placed in with the waste to leave the area clear of all current and future operations.

As with Stage 1 , towards the end of this filling stage (or earlier if necessary) heavier equipment may be required to carry out some compaction and raising of the waste to design level before covering with 600mm of soil.

FIGURE 5 STAGE 3 FILLING PLAN

This figure illustrates the completion of the Stage 3 filling program.

A similar filling program to that described above for Stages 1 and 2 should be carried out.

As with the Stage 1 filling program, additional soil and/or local inert concrete pieces or the like can be used to allow the FEL to push up and ride over the waste.

With the discontinuance of burning waste there will be more paper/cardboard and other “soft“ waste within the mix, including putrescible waste, which may make it easier for the light equipment to track over the waste with the use of additional soil.

Additional soil will need to be applied in any event to control flies, rodents, birds and litter in the absence of burning.

FIGURE 6 STAGES 4, 5 AND 6 FILLING PLAN

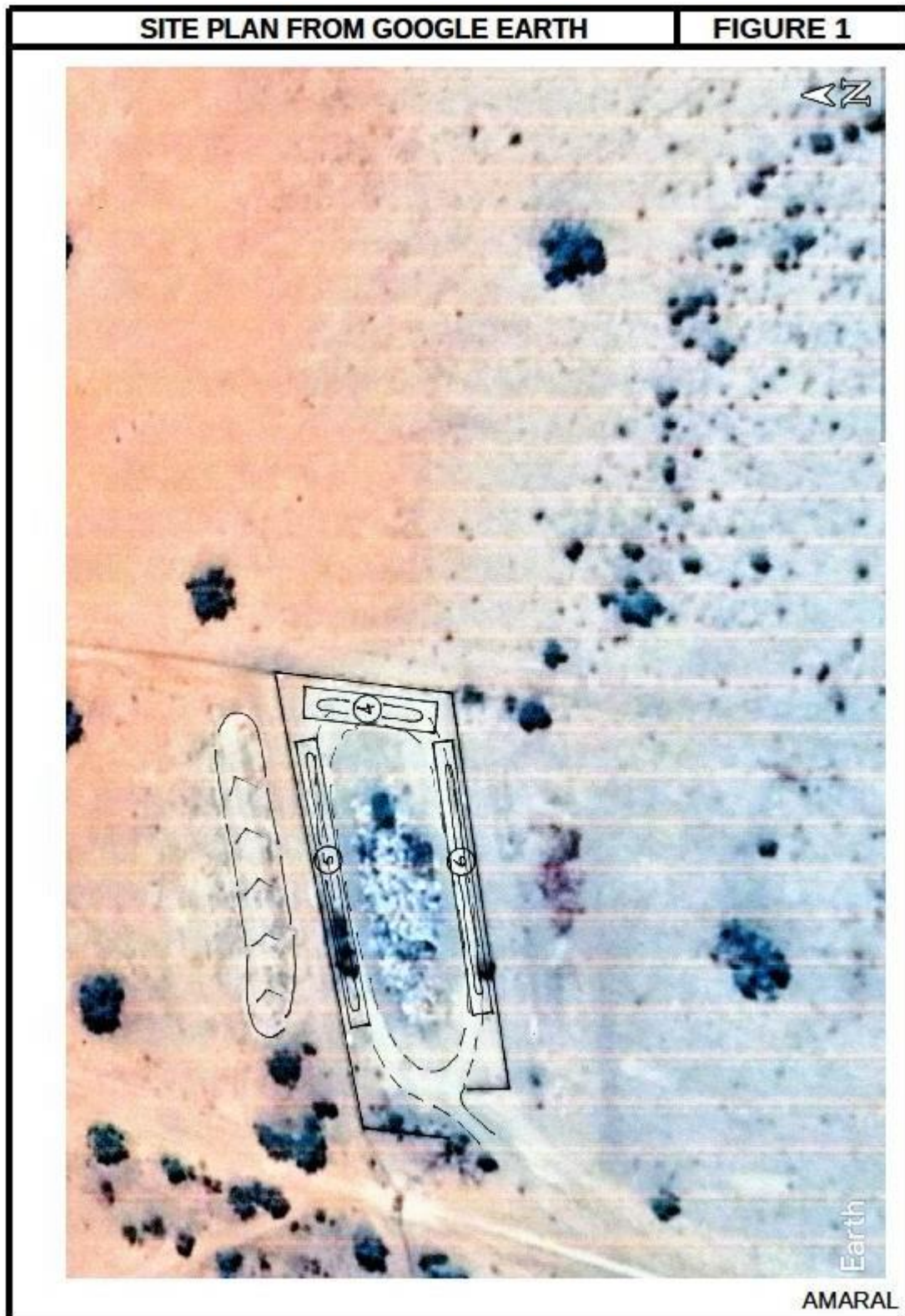
The extensive soil levee banks around the Stage 1, 2 and 3 filling areas are sufficiently wide to allow trenches to be dug as shown on this figure to a depth of 2m or so and still leave sufficient of the levee banks in place to provide adequate protection to the landfill area.

Starting at Stage 4, ready access will be available to fill the trench from both the north and south. A suggested filling method is illustrated in Appendix 4.

As with the other stages the occasional use of a heavier piece of equipment will likely be required to achieve additional compaction, increase the capacity of each trench and allow the placement of the final cover on more uniform surface.

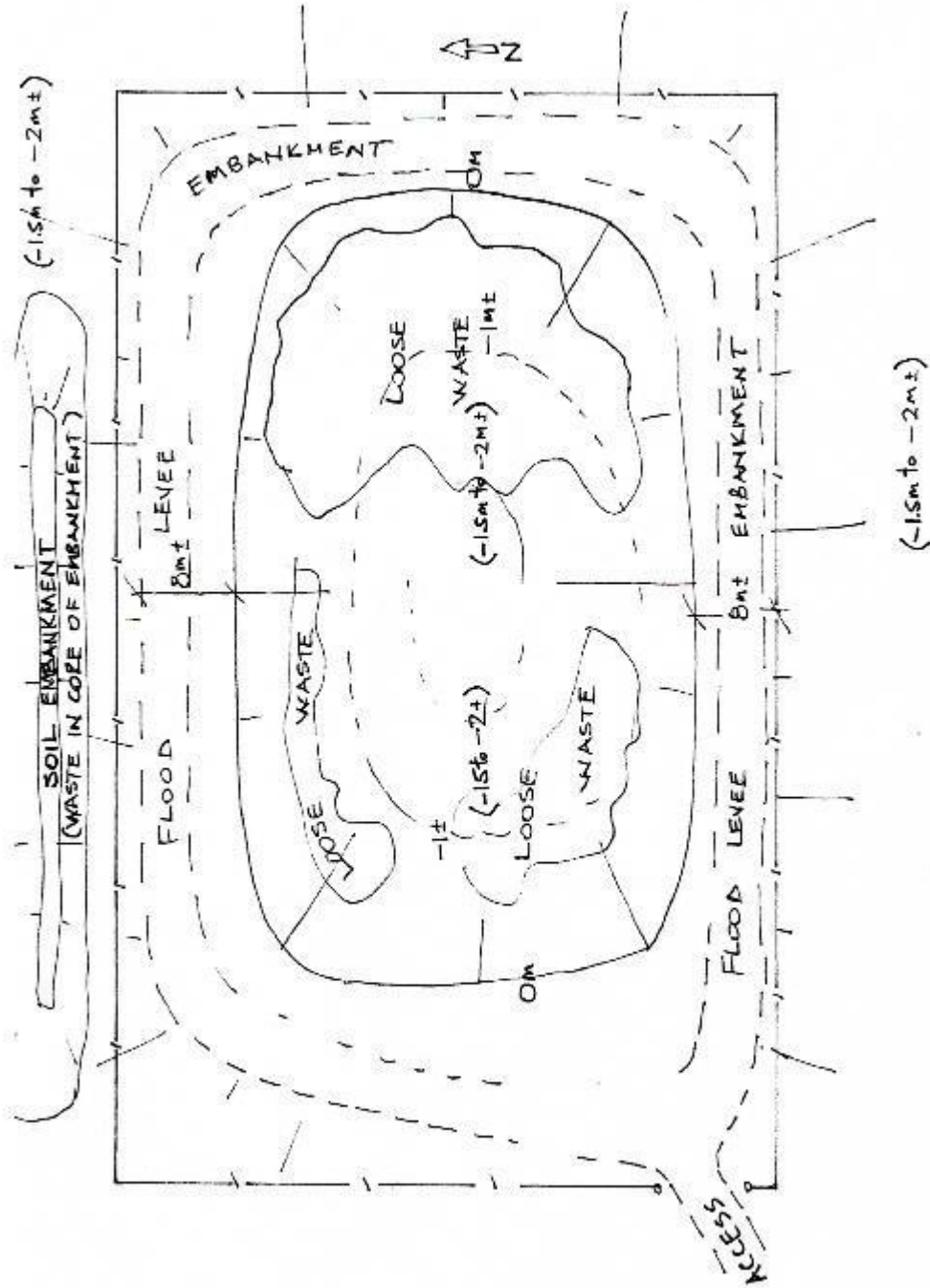
The soil excavated from Stages 4, 5 and 6 should be placed adjacent to the trenches on the completed Stages 1, 2 and 3 to allow covering of the trenches, with the excess soil being spread over the completed landform to promote the shedding of surface water.

Appendix 2 – Design Concept Figures 1 to 6



SCHEMATIC SITE PLAN

FIGURE 2

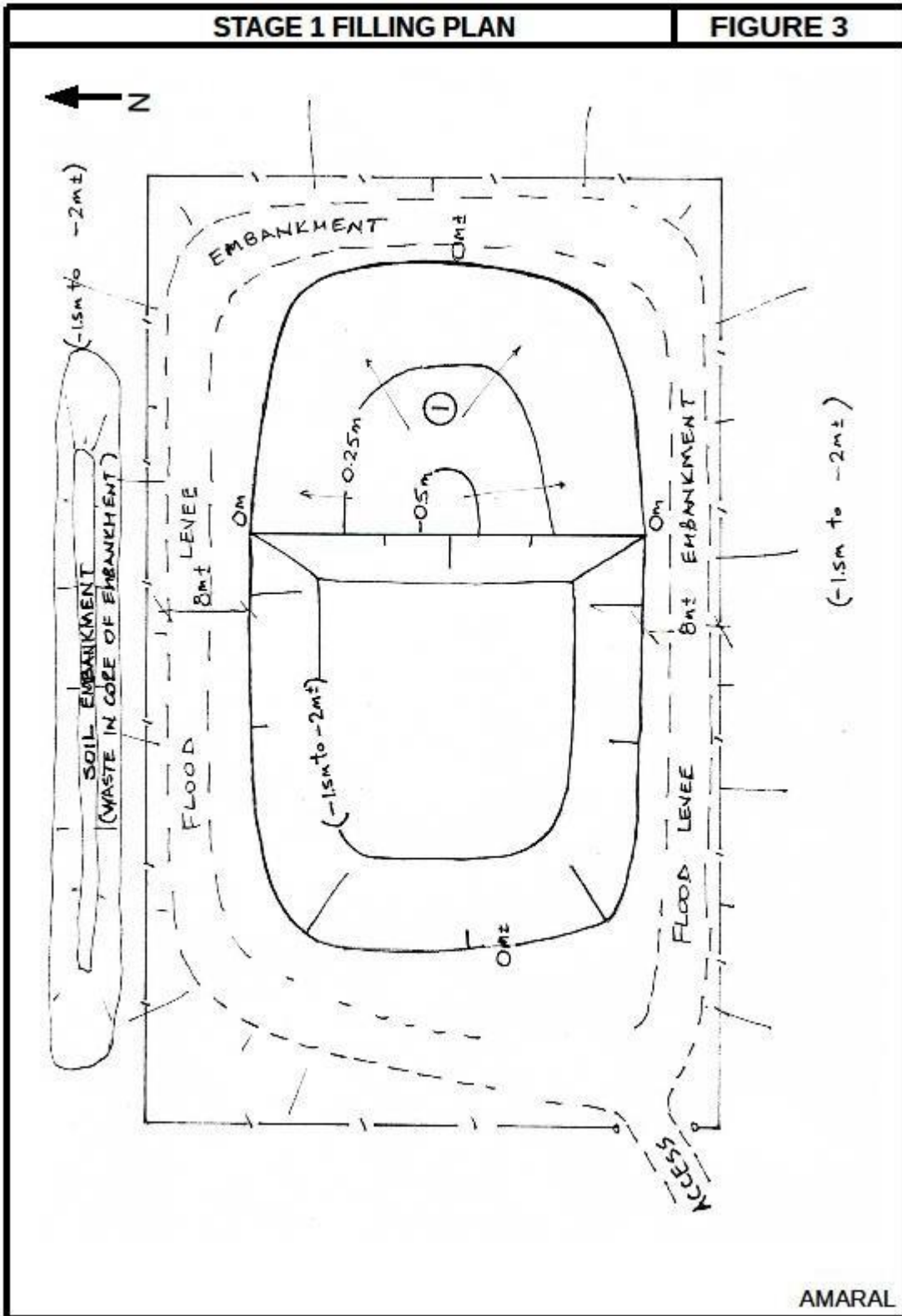


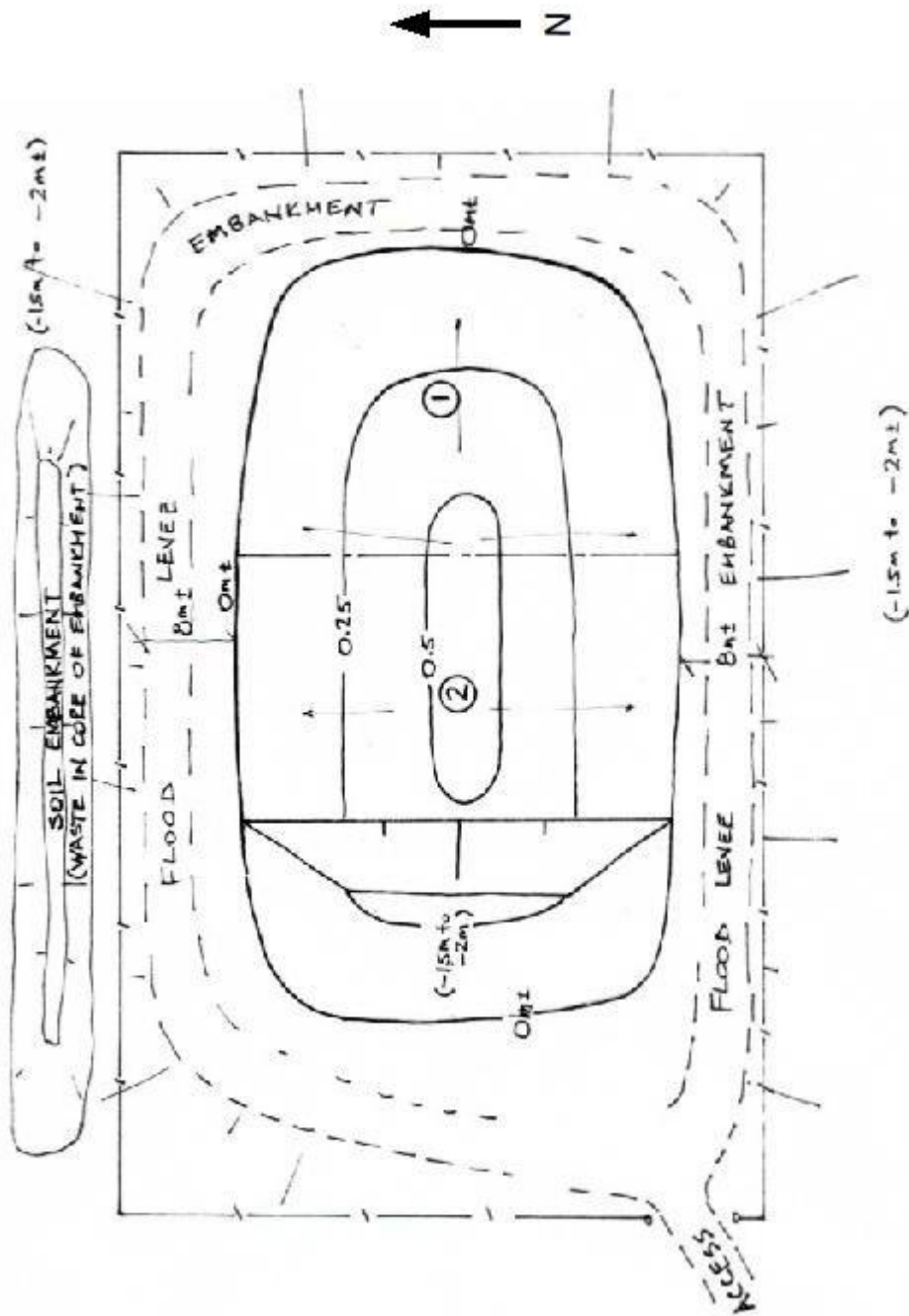
NOT TO SCALE

AMARAL

STAGE 1 FILLING PLAN

FIGURE 3



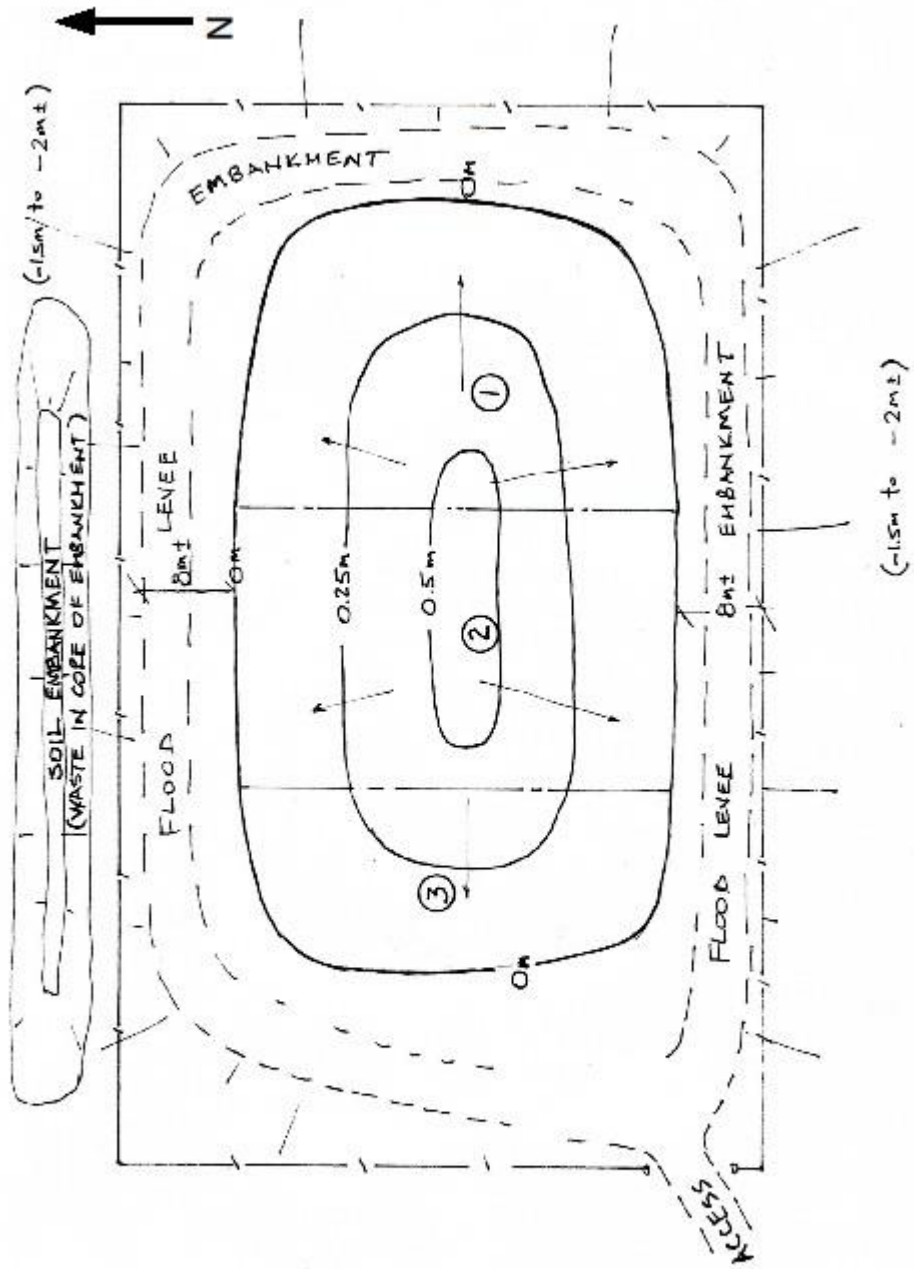


SCHEMATIC / NOT TO SCALE

AMARAL

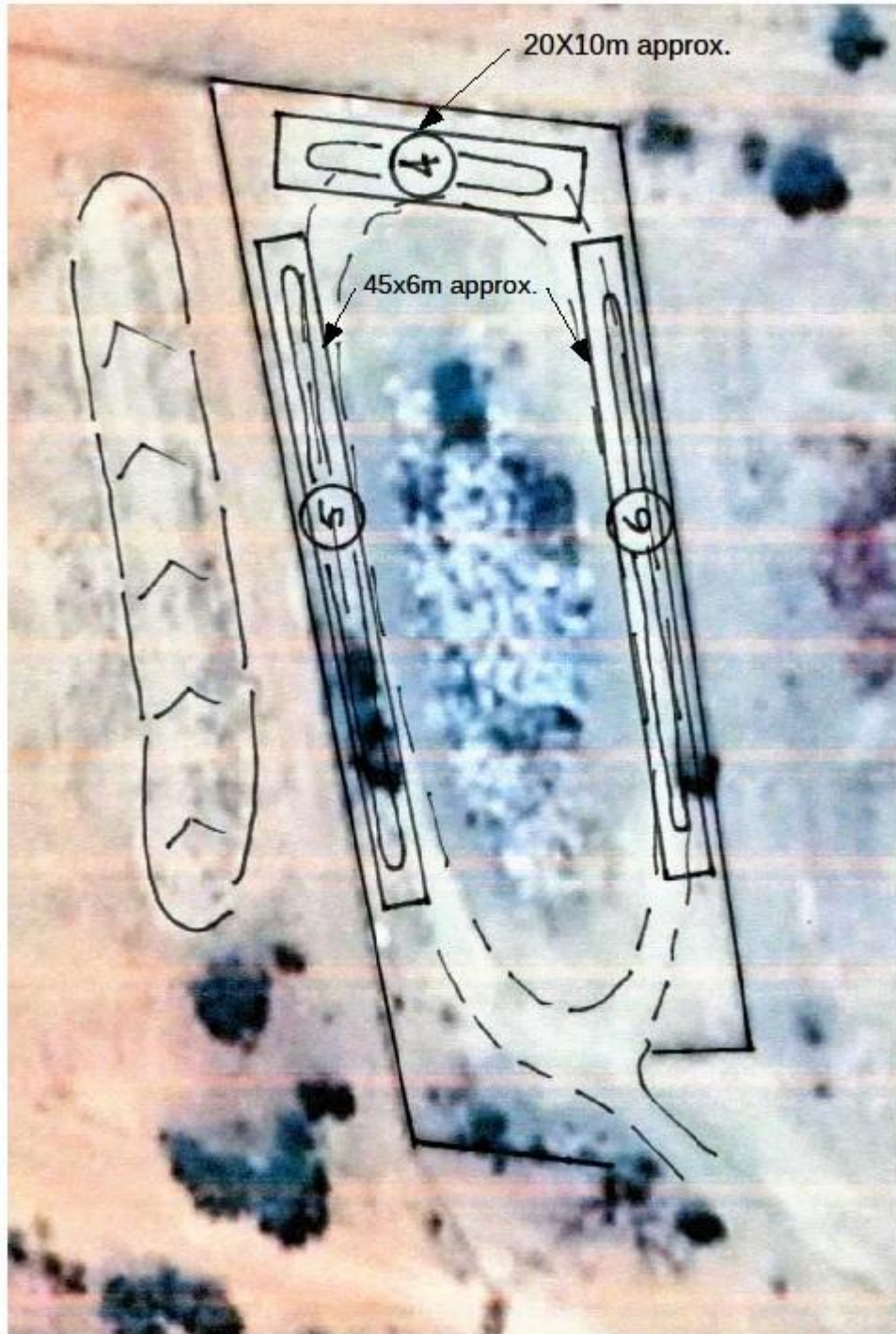
STAGE 3 FILLING PLAN

FIGURE 5



SCHEMATIC / NOT TO SCALE

AMARAL

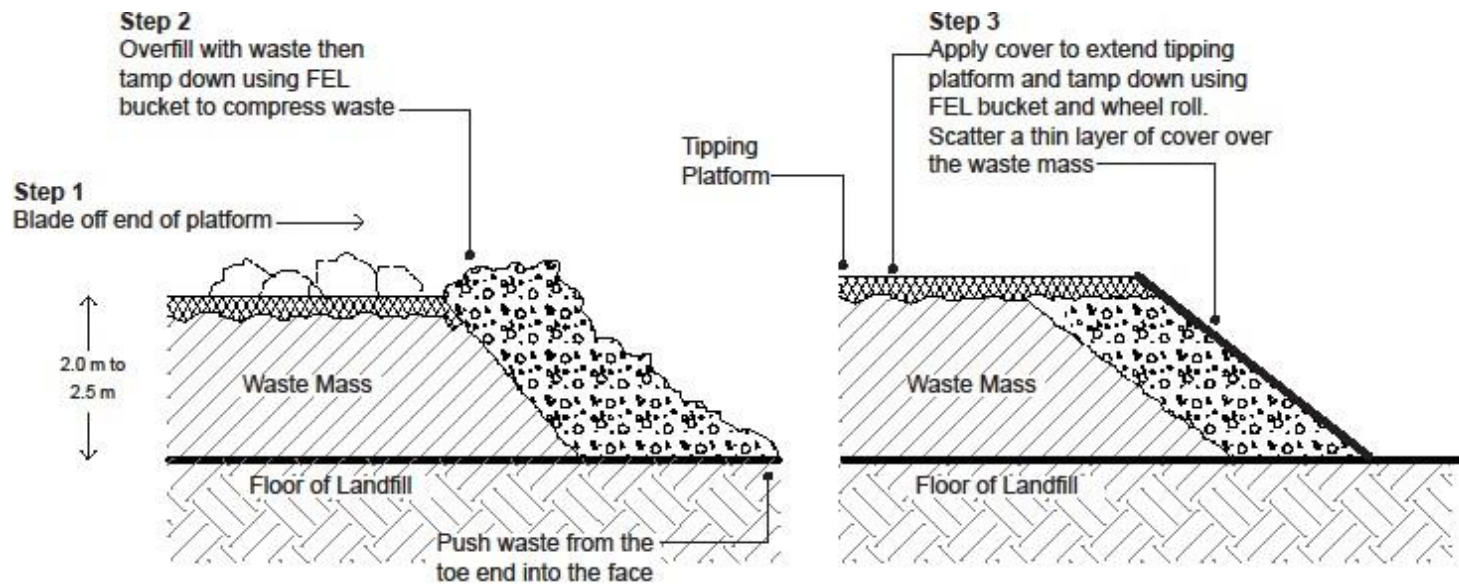


AMARAL

Appendix 3 - Aerial Location Plan



Appendix 4 – Waste Placement Technique



Note – Tamp down the exposed waste with the FEL bucket from the top and then, if accessible, from the toe area push any loose waste into the leading face. Then tamp in the exposed waste with the FEL bucket. Scatter some soil over the leading face from the top (and from the bottom, if accessible) after tamping is completed. This will save cover material and reduce windblown litter

WASTE PLACEMENT TECHNIQUE USING FEL ONLY