

TECHNICAL REPORT

PROJECT NO: 2017/LANDFILL SITE/02:
LUCKHOFF: CLOSURE OF EXISTING SOLID WASTE SITE AND
CONSTRUCTION OF WASTE FACILITY

November 2021

Prepared for:

LETSEMENG LOCAL MUNICIPALITY



7 Groot trek
Koffiefontein
9986

Attention: Mr. M. Tsoene

Prepared by:

DIPABALA CONSULTING ENGINEERS



No. 60 Raymond Mhalba Street
Navalsig
Bloemfontein
9301

Prepared by: Mr. T. Motheane

Technical Report - Luckhoff: Closure of existing solid waste site and construction of a new waste facility (Landfill Site)

Title: 2017/Landfill site/02: Technical Report - Luckhoff: Closure of existing solid waste site and construction of a new waste facility (Landfill Site)

Client: LETSEMENG LOCAL MUNICIPALITY

Author: T.Motheane

Team Members: T. Motheane, G. Mohanoe, L. Tigedi, D. Avumile

DIPABALA
Project Number: DCE05/R2

DIPABALA
Report Number: PDR 17/08/21-R1

Date of this issue: 09th November 2021



.....
T Motheane – Technologist
Author

Reviewed For Approval:

.....

LETSEMENG LOCAL MUNICIPALITY

Contents

1	INTRODUCTION	4
1.1	Purpose and Objectives of the Project	4
1.2	Macro-Planning	4
1.3	Pollution risks	5
1.4	Relevant documentation	5
2	STATUS QUO OF THE PROJECT AREA	5
2.1	Letsemeng Local Municipality: Luckhoff Existing Landfill disposal Site	5
2.2	SITE LOCATION AND GENERAL DESCRIPTION	6
2.3	Population and Social-economic data	6
2.4	Existing waste collection and disposal infrastructure	7
2.5	Method of disposal	7
2.6	Water Supply	7
2.7	Sanitation	7
3	New waste disposal site	7
3.1	Motivation for the chosen option	7
3.2	Individual components of the new solid waste disposal site	9
3.3	Design criteria	12
4.	Legal Requirements	18
4.1	Existing disposal site	18
4.2	New waste disposal facility	19

1 INTRODUCTION

1.1 *Purpose and Objectives of the Project*

Dipabala Consulting Engineers were appointed to provide professional engineering services for the rehabilitation of the existing land fill site and construction of a new waste facility in Luckhoff, Letsemeng local Municipality (LLM), and Free State Province. The report serves to communicate a preliminary design for the proposed new Luckhoff waste disposal facility (WDF) as well as presenting some basic requirements for waste disposal facility by landfill. A cost estimate for the total project has also been prepared and included in this report for budgetary purposes.

1.1.1 Purpose

The purpose of this project is to address inadequacies in the current waste management system by implementation of efficient and good waste management practices. This will be achieved through proper planning, execution and commissioning of the project. Training of LLM's workers to be responsible for operations and maintenance will also be conducted in order to ensure that the new landfill site fulfill the intended purpose.

1.1.2 Objective

The objective of this project is to address the challenges faced by the community after the closure of the existing site in terms of solid waste management requirements whereby it is one of the projects identified in the Municipal IDP and Municipal MTEF Implementation Plan.

Other project objectives are to develop a landfill site that is:-

- Environmentally acceptable to avoid any degradation of the environment in which the landfill is located.
- Prevent pollution of the surface and ground water.

1.2 *Macro-Planning*

This technical report forms part of the MIG Funding Application process: a part of the local WS Sector level of the project lifecycle for MIG funded projects.

1.3 Pollution risks

To be addressed by the Environmental Impact Assessment Process (EIA) to be undertaken as part of the Waste Management License and Environmental Authorization Application.

1.4 Relevant documentation

The following documents were used primarily as reference in developing the design of the facility:-

- National Environmental Management: Waste Act (2008).
- Minimum Requirements for Waste Disposal by Landfill: Department of Water Affairs and Forestry, Republic of South Africa, Second Edition 1998 ('Minimum Requirements).
- National Environmental Management: Waste Act (2008): National norms and standards for disposal of waste to landfill:
- Guidelines for Human Settlement Planning and Design: Vol. 2, 2005
- SABS 1200 Series (Civil Engineering Specifications).

2 STATUS QUO OF THE PROJECT AREA

2.1 Letsemeng Local Municipality: Luckhoff Existing Landfill disposal Site

The existing Waste disposal site in Luckhoff is located 120m from Water Purification Treatment Works, and it is in close proximity to residential area. The Environmental Impact Assessment conducted by Environmental Practitioner appointed by MISA recommended for Waste disposal site closure, a license was applied for and issued by the relevant authority. The existing Luckhoff Waste disposal site closure license (refer to *Appendix C*), stipulates the conditions and time-frames for official closure and rehabilitation.

This waste disposal facility is not well operated and managed as waste is only dumped on an open field, it is not covered nor compacted. General waste and rubble / earth (soil) waste material are dumped on separate designated area. Rubble and earth waste material were being used to cover general waste.

Existing Landfill Rehabilitation design will ensure progressive rehabilitation by:-

- Collecting windblown litter and the waste body cut and shaped on site according to design.
- Apply soil capping and establishment of vegetation.

Technical Report - *Luckhoff: Closure of existing solid waste site and construction of a new waste facility (Landfill Site)*

- For erosion prevention slopes will not be steeper than 1 in 2, 5.
- Material suitable for vegetation will be used for final cover.

Due to state of the existing landfill site and closure thereof, a new Waste disposal site is required. This new site must conform to the National Environmental Management Waste Act (Act 59 of 2008) as amended and standards pertaining to solid waste disposal.

2.2 *SITE LOCATION AND GENERAL DESCRIPTION*

Luckhoff is located approximately 48km south west of Koffiefontein. The existing landfill site, as illustrated in yellow on figure 1 below, is about 2 hectares is located on the east Luckhoff, and the proposed site for the new WDF, as illustrated on figure 1 below, is west of the town. The proposed site is site 6 because we had to shift the selected site 5 to increase distance between the site and drainage line and earth dam

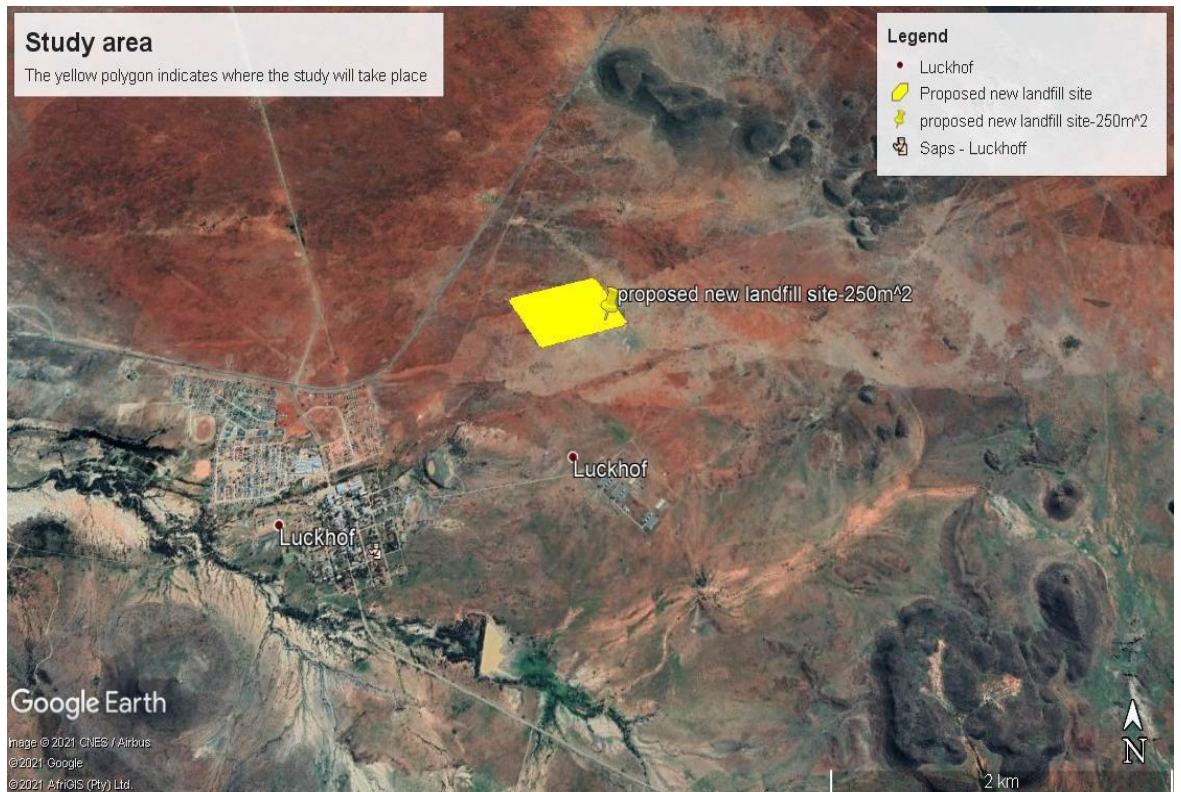


Figure 1: Luckhoff existing and proposed WDF locations.

2.3 *Population and Social-economic data*

According to census 2011, Letsemeng local Municipality has a total population of 38 628 people, with 11 242 households.

Luckhoff is a small rural village with a population of 8 800 people (according to project business

Technical Report - *Luckhoff: Closure of existing solid waste site and construction of a new waste facility (Landfill Site plan)*. According to government census: -

- 25% of the Population is non-poor and 75% is poor.
- Luckhoff population growth rate is -1%, thus a growth rate of 1% (estimated) will be used for the purpose of this Technical report.

The main social and economic functions of the town are to serve as: - (a) General agricultural service centre to surrounding farming areas, and (b) Social function such as residence, education and medical services. There are no significant commercial or industrial sites that would generate additional volumes of waste. Existing waste collection and disposal infrastructure

According to our analysis the existing waste disposal could be classified as G.C.B site. The WDF is owned and operated by the Municipality.

2.4 Method of disposal

Hazardous industrial waste, agricultural and forestry waste (pesticides, medical waste, mining waste, power station waste, radioactive medical waste and radioactive mining waste will be addressed at provincial government level.

2.5 Water Supply

Water for the facility will be through an existing Municipal connection.

2.6 Sanitation

Waterborne sanitation services for the facility will be via a new Municipal connection.

3 New waste disposal site

3.1 Motivation for the chosen option

The site for the proposed new waste disposal facility is distant from residential or commercial facility hence it is recommended. The site selection process was adhered to as per Minimum requirements for waste disposal by landfill (Dept. Water affairs and forestry, 2ND Edition, 1998)

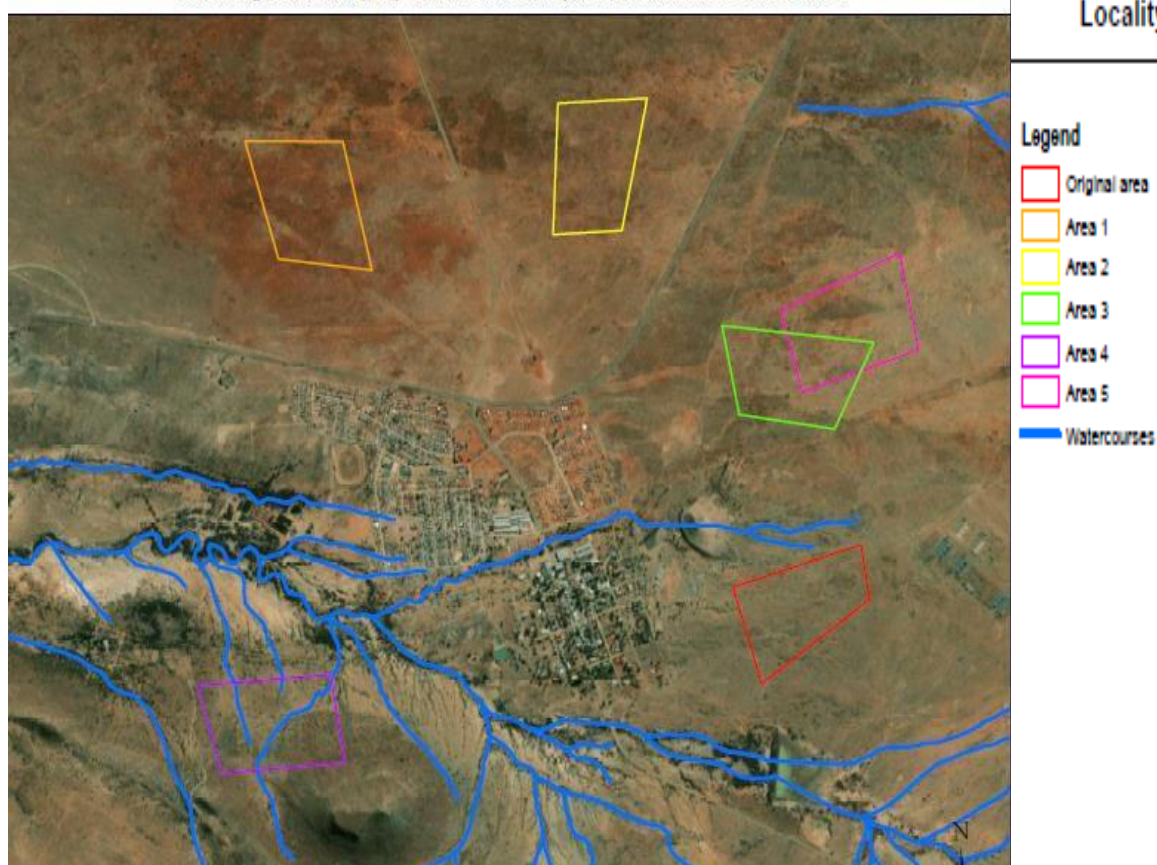


Figure 2: Letsemeng Local Municipality: Luckhoff Landfill Site Development

Area 5 (which is now called site 6) is the site which has been recommended by specialist to be the most suitable area for the proposed development. The following details were explained by the specialist as reasons to why area 4 is not suitable for the proposed development:

- 1) The area 4 has some watercourses running through it and subsequently forms part of the local catchment and drainage area towards the significant watercourse to the north (see Figure 2: Letsemeng Local Municipality: Luckhoff Landfill Site Development). Therefore the presence of a landfill site on the proposed development footprint could result in potentially highly significant contamination of the watercourses and broader catchment and drainage area.
- 2) This area is situated right next to one of the alternative sites, which was assessed and found to be unsuitable for this very reason in the original 2017/2018 report.
- 3) The proposed development footprint also seems to be going up the side slope of the significantly sized hill, which is present to the south and therefore the moderate to steeply sloping topography up the side slope of the hill will not be suitable for the proposed development.

After our discussions with the Client and consultations with the local councilor, it was conceded for further investigation studies to be conducted for Area 5.

A site assessment and 'ground truthing' of the topography and flow directions of Area 5 must be conducted to determine whether potentially significant contamination of the watercourse to the south and broader catchment and drainage area.

3.2 Individual components of the new solid waste disposal site

A site wide masterplan was developed for the proposed facility through an iterative process.

The following elements were initially considered in determining a concept site layout:-

- Site area
- Site topography (impact on depth of cells and leachate pond position)
- Capital budget
- Likely operational experience and capacity of operator
- Availability of water and sewer services.

The site will be developed in one individual cell, with a linked leachate pipe network ultimately discharging to a leachate storage (and evaporation pond). Salient details of the concept design are presented in Table 1 below.

Table 1 Salient design features of the landfill				
Cell	Cell base Dimensions (m x m)	Base area (m ²)	Airspace (m ³)	Lifespan (years)
Cell 1	160 X 160	25 600,00	51 200,0	20

3.2.1 Recycling programme

Waste minimization initiative should be encouraged in line with the NWMS (National Waste Management Strategy of 2011) e.g. waste separation at source.

3.2.2 Waste collection and transport systems

Due to the town being small with 1600 households, two trucks equipped with a trailer, will allow the Municipality to provide a weekly collection for the whole town. Two trucks are recommended so that there is a back-up should there be operational problems or maintenance required on either of the trucks.

3.2.3 Investigation of proposed site

This will be informed by the specialist studies conducted during the environmental authorisation process.

3.2.4 Technical Elements

Site water management

The 25ha site generally slopes from the east to west, at an average slope of 3.3%. Stormwater will be managed in such a way that, the run-off from outside the boundaries of the landfill site is diverted (from running into the site) by an earth/gravel berm north eastern boundary. All stormwater-runoff generated within the site, will be all be collected through an open-stormwater channel and retained in a retention pond south west of the site. No stormwater generated within the site will flow outside the landfill boundaries, this is a measure put in place to prevent any form of contamination to the near-by water body.

Leachate containment

A landfill facility has the potential to generate highly polluted wastewater, termed leachate. The landfill cell is to be constructed with lining system to protect the receiving environment, which incorporate drainage layers that capture generated leachate from within the landfill containment cell and direct it to a leachate containment pond (LCP). The size of the LCP is to be based on a 1:50 year rainfall event, whilst the catchment is the number of uncapped cells that are linked to the pond.

It is inherently difficult to predict the likely volumes that will be generated by the site over time and by inference in sizing the leachate storage facility. Each landfill is unique in terms of location, climate, mode of operation and waste characteristics (amongst other factors) and therefore the use of historic information from other landfills may not render correct generation estimates. Furthermore, there is a lack of information on leachate volumes generated by small landfills in water deficit regions given that these sites never required leachate management systems previously. In terms of the Minimum Requirements, the site falls in a water deficit area and should therefore generate little to no leachate. However, in terms of the new Norms and Standards a leachate retention system is required.

Adopting a cautionary approach to the sizing of the LCP, it is assumed that a worse case is when there is a small amount of waste in a cell, which in contaminates all stormwater falling within the cell. All run off from the cell will be diverted to the LCP with no attenuation within

the waste body. It must be noted that the LCP has been sized for the run off from the largest anticipated cell. This approach has been taken for the following reasons:

- The LCP will be disproportionately large in comparison to the landfill facility area if all cells contribute their contaminated run off;
- It will require the Letsemeng Municipality to proceed with continuous rehabilitation as this will be the only solution to limiting contaminated run off to the operating cell alone.

Therefore the facility has been designed to store a maximum of 5m³ with a freeboard of 0.5m for a 1:50 year storm event.

Leachate collection

A leachate collection system (LCS) consisting of perforated pipes laid out in a herringbone pattern. Within a layer of stone, placed on top of the HDPE geomembrane protection layer will be installed. This will collect leachate from within the landfill and direct it to the adjacent leachate storage/ Evaporation pond. The collected leachate will be used for dust suppression or be left to evaporate, any residual waste found in the pond after evaporation will be disposed of on the landfill.

Contaminated stormwater

Stormwater runoff from a waste body is termed contaminated stormwater and has the potential to exceed water quality discharge standards. Therefore any surface stormwater discharging from the waste body must either:

- Be diverted to a stormwater retention dam where it can be treated or discharged; or
- Be diverted into the leachate system.

Given the small cell footprints and consequently low run-off volumes contaminated stormwater will be captured in the leachate system and be discharged into the leachate pond where it will be 'treated' through evaporation.

Clean stormwater

Clean stormwater emanating from the catchment reaches above the disposal facility will be diverted around the site to minimise the potential to generate contaminated storm-water through the use of cut-off drains or diversion berms.

Lining system

As the site will be accepting MSW, a Class 2 waste, the corresponding lining system is a Class B liner, as shown on figure 3 overleaf, as per the National Norms and Standards for Disposal

Technical Report - Luckhoff: Closure of existing solid waste site and construction of a new waste facility (Landfill Site) of Waste to Landfill. Due to the unavailability of natural construction materials on site, geosynthetic materials have been specified in their place. The equivalency testing of these geosynthetic substitutes are to be done during the preliminary design stage.

(b) Class B Landfill:

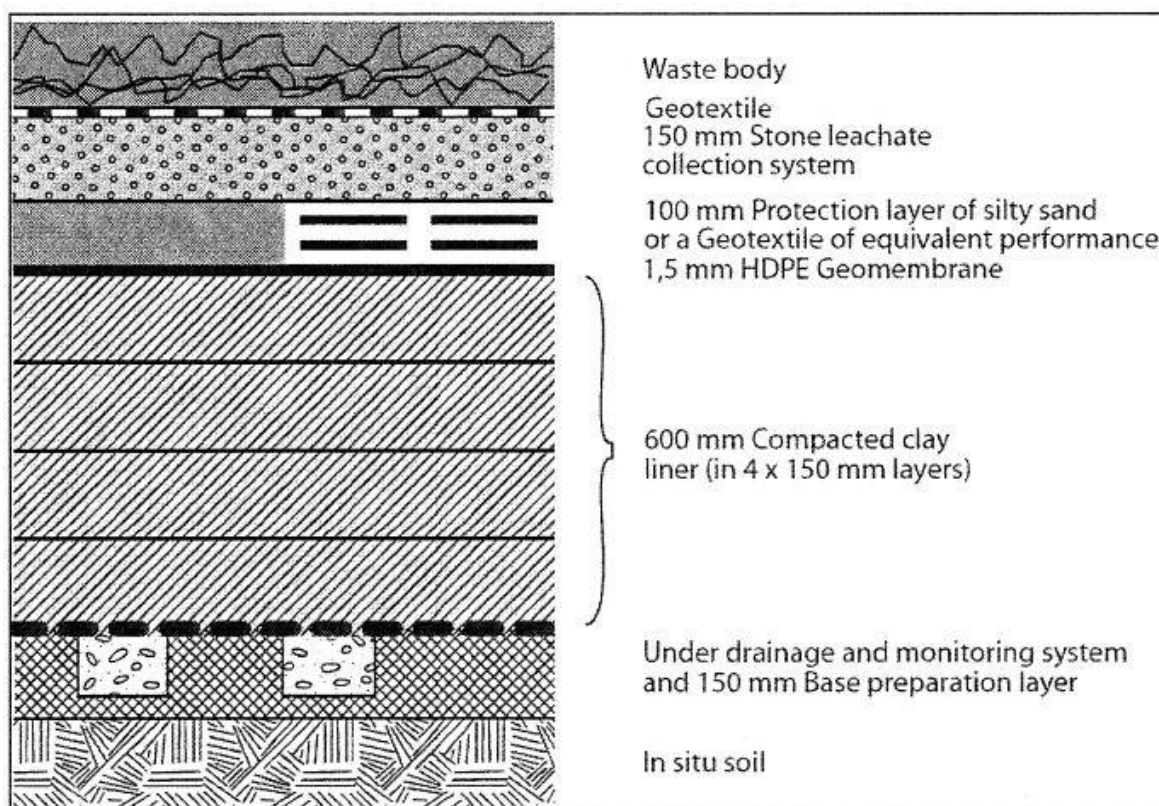


Figure 3: Class B liner detail (source: National Environmental Management: Waste Act (2008): National norms and standards for disposal of waste to landfill)

Monitoring systems

A borehole monitoring network will be installed on site to allow accurate monitoring of both the upstream and downstream subsoil water quality of the facility.

Landfill gas (LFG) sampling points will also be installed into the waste body to allow for easy access together LFG samples for regular monitoring of the emissions from the waste body should it be required.

3.3 Design criteria

The following assumptions have been made to determine the size and lifespan of the facility:

Table 2 Population and growth rates			
Town	Projected Population in 2017	Growth rate (%)	IRD (tons/day)
Luckhoff	8 800,00	1.0	4,4

Total	8 800,00	1.0	4,4
-------	----------	-----	-----

- Waste generation rate = 0.5 kg/capita/day (Min Req)
- Average density of the compacted waste in the landfill = 1,000 kg/m³
- Lifespan required = 20 years

3.3.1 Size of waste stream

The Maximum rate of deposition (MRD) was calculated from the initial rate of deposition (IRD), the anticipated population growth rate, and the planned life of the site according to the following formula:

$$MRD = (IRD)(1+d)^t$$

Where

- MRD = the maximum rate of deposition in tonnes/day during the final year of operation.
- IRD = the initial rate of deposition in tonnes/day and would either be measured or estimated from appropriate information.
- d = the expected (constant) annual increase in the rate of deposition and would usually be based on the anticipated population growth rate.
- t = the period or planned life of the site expressed in years.

Calculation

- T = 20 years
- D = The individual growth rates for each town (see Table 2) were used
- IRD = Calculated using a waste generation rate of 0.5kg/capita/day,(see Table 2)
- MRD = See table below

Town	MRD (tons/day)
Luckhoff	5.4
Total	5.4

According to the classification size classes of the Min Req '98, the new waste facility site would be classified as Small size class: G: C: B

3.3.2 Cover, airspace and site life

Using a waste to cover ratio of 1:6 by volume a total airspace volume of 50 000m³ is required at an assumed waste density of 1 ton = 1 m³ to store 20 years' worth of waste. This requires a landfill Footprint of roughly 2.56Ha at a maximum height of 2m above natural ground level (NGL) (overfilled by 2m to 7m above NGL to allow for settlement before capping).

3.4 *Site layout*

The site will be located to the east of Luckhoff town. External side slopes will be graded to 1(vertical) to 3(horizontal) sufficient to ensure stability as well as providing a soft contour to blend easier into

The surrounding environment. This grade is also adequate for grassing and erosion protection when the site is capped and rehabilitated for its end use.

The site will be accessed via off the Luckhoff new access road which will be constructed and the site will be fenced, a minimum of 1,8m high, to prevent unauthorised access to the site. New direction signage and information boards will be installed.

3.5 *Progressive rehabilitation plan*

During operation of the site, rehabilitation is to occur progressively throughout the life of the site on completed areas. It is important that land shaping is undertaken correctly from the beginning to avoid returning at the closure of the landfill to conduct further earthworks as this will compromise vegetation that has established itself to that point.

Progressive rehabilitation will include the placement of capping material, consisting of a 300mm thick layer of clay and a further 150mm thick layer of topsoil. The capping material must be distributed evenly and compaction of the topsoil must be avoided, as this will inhibit vegetation regrowth. The soil should be seeded with indigenous grasses tolerant of methane gas as traces may percolate through the soil from the waste below. The progressive rehabilitation plan will be stipulated in detail in the Landfill Operational Plan.

3.6 *Health, Hygiene and Waste Minimisation Education Programme*

Once the project is commissioned Letsemeng Local Municipality together with the District Municipality (Environmental section) an educational programme will be done and an awareness will be on the day of project completion to the whole community.

3.7 *Proposed job creation*

3.5% of the total project cost will go towards labour component on the project (see Municipal Infrastructure Grant: Project Registration Form).

3.8 Operation and maintenance

Waste collection in Luckhoff can be carried out by use of two trucks with trailers. The Town will be divided into sections to allow for all properties to be serviced once a week.

3.9 Total Project Phase 1: Budget and Expenditure and Phase 2: Cost estimate

Phase 1 Budget and Expenditure to date is shown below: -

Table 4.1: Value of Civil and Environmental work carried out within Phase 1

STAGE OF WORK	Actual Scheduled	Scheduled Deliverables (%)	% Progress to date
1. Inception Report and Project			
i) Planning of project execution			
ii) Collating of the approved documents			
iii) Ratification of the proposed methodology	R 5 000,00	2%	100%
iv) Compilation of the status Quo(Inception) re			
v) Meeting with the client (Municipal Officials)			
2. Scoping/Pre-feasibility study of landfill sites(s) selection from five Sites			
i) Assess Physical and characteristics in terms of			
ii) Assess the ecological status quo of the area w.r.t flora and fauna	R 69 705,75	21%	100%
iii) Identify threatened or affected species			
iv) Select a suitable site			
v) Develop mitigation measures			
vi) Draw a monitoring and Review component			
3. Waste License Application			
i) Compilation of the form			
ii) Submission of the application form for waste management license to the relevant Authority(Provincial government) for And getting consent.	R 5 231,25	2%	100%
4. Detailed EIA studies including:			
a) Public Participation processes	R 20 150,00	6%	90%
b) Ecological studies (Incremental to item	R 18 220,00	5%	90%
c)	R 13 200,00	4%	90%
d) Geotechnical investigations including lab	R 20 000,00	6%	80%
	R -		
e) Geohydrological investigations and water Monitoring tests reports	R 49 659,00	15%	80%
	R -		
f) Topographical and land surveys	R 15 000,00	5%	80%
g)	R 11 460,00	3%	80%
h) Environmental Management Plan (EMP)	R 30 225,00	9%	80%
5. Engineering Designs	R 60 000,00	18%	50%
6. Training of Municipal Professional officials - Capacity	R -	0%	0%
7.			
Printing and duplication etc.	R 14 184,00	4%	100%
8.	R 332 035,00	100%	80%
9.	R 49 805,25		
Grand Total (Carried to summary)	R 381 840,25		

The table below indicates a summarized cost estimate for the project:

Table 4,2	Cost for Closure of existing Disposal Site	AMOUNT
4,1	Construction Cost for Closure of existing Disposal Site	
	Shape Existing waste body	R 155 400,00
	Capping system	R 270 000,00
	Installation of Boreholes (for Existing WDF)	R 200 000,00
	Stormwater drainage system around the Cells	R 120 000,00
	Repairs to the fence and Installation of access gate	R 46 000,00
	Preliminary and General items	R 118 710,00
	Sub-total (DIRECT COSTS)	R 910 110,00
4,2	Professional Fees (15%) - INDIRECT COSTS	R 136 516,50
	Sub-total (DIRECT + INDIRECT COSTS)	R 1 046 626,50
	PLUS: VAT (15%)	R 156 993,98
	TOTAL COSTS (Including VAT)	R 1 203 620,48

Note that the Cost for closure of existing Disposal Site on Table 4.2 above was not included in the Business Plan for the new waste disposal facility. Closure will be implemented as separate project.

Table 5	Cost for a New Luckhoff WDF	AMOUNT
5,1	Construction Cost for a New Site	
	Landfill Cell (160m x160m x 2m) - Earthworks and Construction of Liner	R 2 290 782,61
	Infrastructure	
	25m ² Building consisting of Guard house, ablution block and Offices	R 86 956,52
	10m x 15m Waste Recycling Facility - Portal Frame Steel Structure	R 195 652,17
	1750m long x 1,8m high Razor Mesh fence with 6m wide Gate and 3m Wide Pedestrian Gate	R 532 608,70
	Training (Community Awareness, Operation and Maintenance)	R 50 000,00
	500m Access Road to site, internal road and weigh pad.	R 652 173,91
	Preliminary and General items	R 456 980,87
	10% Contingencies	R 380 817,39
	Sub-total - DIRECT COST	R 4 645 972,17
5,2	Professional Fees (15%)	R 600 007,87
	Sub-total - INDIRECT COST	R 600 007,87
	Sub-total - DIRECT AND INDIRECT COSTS	R 5 245 980,04
	PLUS: VAT (15%)	R 786 897,01
	TOTAL ESTIMATED PROJECT COSTS (Including VAT)	R 6 032 877,05

Note that the Cost for Establishment of a new Waste Disposal Facility on Table 5 above was included in the Business Plan for the new waste disposal facility. The actual cost will be determined by the Tender offers during the contractor procurement stage.

Table 5,3	Cost for Closure of ADDITIONAL Elements to the NEW	AMOUNT
4,1	Construction Cost for Closure of existing Disposal Site	
	Leachate pond	R 350 000,00
	Installation Boreholes (for the new WDF)	R 200 000,00
	Sub-total - DIRECT COST	R 550 000,00
5,3	Site Supervision, Travelling and Accommodation	
	Site Supervision (R20000/month)(Level 2)	R 160 000,00
	Anticipated Construction Period - 8 Months	
	Disbursements (Travelling, Printing, Binding and	R 20 000,00
	Sub-total - INDIRECT COST	R 180 000,00
	Sub-total - DIRECT AND INDIRECT COSTS	R 730 000,00
	PLUS: VAT (15%)	R 109 500,00
	TOTAL COSTS (Including VAT)	R 839 500,00

Note that the additional Cost for Establishment of a new Waste Disposal Facility on Table 5 above was NOT included in the Business Plan for the new waste disposal facility. The need for the above elements will be refined during detailed design stage of the project.

3.10 Construction cost estimate

The total summarized cost of closure of the existing site and construction of the new landfill site, as detailed in is shown on Table 6 below.

	TOTAL PROJECT COST SUMMAY	AMOUNT
5	Cost for a New Luckhoff WDF	R 6 032 877,05
	TOTAL PROJECT COST INCLUDING	R 6 032 877,05

3.11 Funding plan

The funding plan is that the Department of Cooperative Governance and Traditional Affairs will fund through the Municipal infrastructure grant on all the phases of the projects from EIA applications, registrations, design and project implementation on site as per the programme and revisions made by the Municipality

3.12 Time Plan

3.12.1 Environmental authorisation processes existing disposal site

A closure license for the existing site has already been issued, thus the existing site must now only be rehabilitated. The Project is now within the application process for the new landfill site, which is a full Scoping/EIA process and a basic assessment process to obtain a WML and EM

Technical Report - *Luckhoff: Closure of existing solid waste site and construction of a new waste facility (Landfill Site)* respectively. The proposed timeline is presented in Annexure B- Project Implementation Plan.

Refer to Appendix B for Design and Construction programme.

3.13 Acceptance by local authority

All documentation will be forwarded to Letsemeng Local Municipality and all relevant authorities for approval throughout all stages of the project.

4. Legal Requirements

4.1 Existing disposal site

4.1.1 Closure procedures

The requirements and standards as prescribed by the National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) (NEMA: WA) apply. Permitting and procedures for a Basic Assessment are applicable to the decommissioning of an existing landfill site and will be executed according to the following guidelines.

- Classification of the landfill site.
- Apply for closure of the site.
- Investigate landfill site to determine closure requirements.
- Determination of the end-use requirements of the site.
- Submit a closure design.
- Obtain permit under Section 45 of the National Environmental Management: Waste Act, 2008 (Act No 59 of 2008)
- Compile a landfill closure report;
- Rehabilitate site;
- Close landfill site;
- Monitor closed landfill;
- Training of staff to maintain the facility;
- Educating the community.

4.2 *New waste disposal facility*

4.1.2 Permitting procedures

The permitting requirements include compliance to the revised Environmental Impact Assessment (EIA) Regulations published in December 2014 (promulgated in Government Gazette No. 3822, 7 April 2017).

These regulations entail that a scoping exercise be undertaken which must include public participation. Alternative sites must be considered and the best site be identified. The Scoping

Exercise leads to the submission of an Environmental Impact Assessment Report to the relevant Provincial Department of Environment to obtain a Waste Management License. NSVT Consultants are appointed as independent Environmental Assessment Practitioners for the undertaking of the EIA Process. From consultation with the competent authority, in addition to the WML application, an Environmental Authorisation should also be obtained, which will require a Basic Assessment Process to be followed. It should be noted that this will involve 2 separate applications as in the Free State Province, there is no integrated application process for an EA and WML.

5 APPENDICES

5.1 APPENDIX A: PRELIMINARY DESIGN DRAWINGS

5.2 APPENDIX B: PROJECT IMPLEMENTATION PLAN

5.3 APPENDIX C: CLOSURE LICENCE: LUCKHOFF SOLID WASTE DISPOSAL SITE

5.4 APPENDIX D: PHOTOGRAPHIC RECORD OF EXISTING WDF AND THE

PROPOSED NEW WDF

5.5 APPENDIX E: WASTE DISPOSAL FACILITY (WDF) PROJECT SCOPE