ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE DECOMMISSIONING OF THE EXISTING DUMPSITE AND COMMISSIONING OF A NEW LANDFILL SITE IN OMARURU, ERONGO REGION

DECOMMISSIONING AND REHABILITATION PLAN (DRP) FOR THE EXISTING OMARURU DUMPSITE

Prepared for

Municipality of Omaruru

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PROJECT INFORMATION

Project title:	Environmental Impact Assessment (EIA) for the Decommissioning of the existing Dumpsite and Commissioning of a new Landfill site in Omraruru.
Report Type:	Decommissioning and Rehabilitation Plan (DRP)
Proponent:	Municipality of Omaruru P.O. Box 14, Omaruru +264 64 570180
EAP:	Green Gain Environmental Consultants cc
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LIST OF ACRONYMS

DRP	Decommissioning and Rehabilitation Plan
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
EWMP	Environmental and Waste Management Plan
MAWF	Ministry of Agriculture, Water and Forestry
MEFT	Ministry of Environment, Forestry and Tourism
MET	Ministry of Environment and Tourism
MoHSS	Ministry of Health and Social Service
NSWMS	National Solid Waste Management Strategy
PEHA	Public and Environmental Act

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GLOSSARY OF TERMS

This section provides a list of terms and definitions, which may be used in this report and, or other future waste management plans and documents compiled as part for the decommissioning of the Omaruru dumpsite.

Term	Definition
Capping	Placing a cover over contaminated material such as landfill waste or contaminated soil.
Cover/Caps	The material used to cover waste. Cover material is usually soil, but may comprise builders' rubble, ash or other suitable material.
Decommissioning	refers to the administrative and technical actions taken to remove all or some of the regulatory controls from an authorized facility
Disposal	means the discharge, depositing, dumping, spilling, leaking, placing of waste on or at any premises or place set aside by the Council for such purposes, and "dispose" shall have a similar meaning
End-Use Plan	The purpose for which the area of the rehabilitated and closed landfill is used. This may be as a park, playing fields, or other suitable land-use
Hazardous Waste	Waste that is dangerous or potentially harmful to our health or the environment. Hazardous wastes can be liquids, solids, gases, or sludge.
Infectious waste	Any waste which is generated during the diagnosis, treatment or immunisation of humans or animals; in the research pertaining to this; in the manufacturing or testing of biological agents – including blood, blood products and contaminated blood products, cultures, pathological wastes, sharps, human and animal anatomical wastes and isolation wastes that contain or may contain infectious substances
Interested and Affected Parties	Interested and Affected Parties are those people who will be affected in some way by the Waste disposal process. Residents or farmers, a whole residential community, or the public at large may represent them.
Landfill	Place: The waste body created by land filling. This may be above or below grade, or both. Process: To dispose of waste on land, whether by use of waste to fill in excavations or by creation of a landform above grade, where the term "fill" is used in the engineering sense
Litter	Any object or matter discarded or left behind by the person in whose possession or control it was.
Recyclables	Means waste which has been separated from the waste stream, and set aside for purposes of recovery, reuse or recycling.
Waste	Waste is considered to be a material (s) that is no longer wanted or no longer useful. Sources of waste include households, industries, factories, schools, health facilities etc.

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1. INTRODUCTION AND BACKGROUND

1.1 Introduction

The town of Omaruru is served with one old waste disposal site. The dumpsite does not meet the minimum solid waste management standards in terms of its locality and operation. Due to the associated impacts on the biophysical and social environment, the Municipality proposes to decommission the existing dumpsite and establish new landfill site in line with National Solid Waste Management Regulations.

In terms of the Environmental Management Act of 2007 and its Regulations (GN No.30 of 2012), all "waste management, treatment, handling and disposal activities" cannot take place without an Environmental Impact Assessment (EIA) being undertaken and an Environmental Clearance Certificate being obtained. Green Gain Environmental Consultants cc has been appointed to conduct the EIA study for the decommissioning of the existing disposal site and Commissioning of a new disposal site for the new waste disposal site at Omaruru.

As part of the Decommissioning process, a Decommissioning and Rehabilitation Plan (DRP) was prepared. The purpose of the Decommissioning and Rehabilitation Plan is to provide framework for the implementation of decommissioning and rehabilitation activities. The DRP will be submitted to MET for approval and the actual decommissioning work can only commence after the approval has been granted. The consultant is also expected to supervise and oversee the decommissioning and rehabilitation of the site and compile a closure report to the Environmental Commissioner. The process of rehabilitation a dumpsite into a usable land will be a phased activity which depends on the risks and the financial aspects.

1.2 Scope and objectives of the DRP

The purpose of the Decommissioning and Rehabilitation Plan is to provide framework for the implementation of decommissioning and rehabilitation activities. The Decommissioning and Rehabilitation Plan will focus on the following aspects.

a) Existing situation (description, amount, types and nature of waste at dumpsite)
b) Rationale of the site closure
c) Legislative requirements
d) Environmental and Public Health Risk analysis
e) Recommended Remediation/Clean-up Options/methods
f) Responsibilities of different parties during the closing and rehabilitation of the site
g) After uses of a Closed Dumpsite

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2. PROJECT TEAM

2.1 Environmental Assessment Practitioner

This DRP was prepared by

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Green Gain Consultants cc is a Namibian based professional environmental and natural resources consulting firm established and driven through belief, passion, and dedication to sustainable development.

Established in 2012, Green Gain Consultants cc has grown into a substantial team of environmental practitioner in Namibia providing innovative and cost-effective solutions to environmental challenges and help clients meet regulatory and stakeholder expectations for environmental performances.

2.2 Proponent/Applicant

The Municipality of Omaruru

P.O. Box 14

Omaruru

Contact person: Mr. Jesaya Andreas

Environmental Health and Risk Officer

Tel: 064 570180

2.3 Competent Authority

Ministry of Environment, Forestry and Tourism

Directorate of Environmental Affairs/Environmental Commissioner

Windhoek

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3. DESCRIPTION OF THE SITE

3.1 Location

The existing Omaruru waste disposal site is located about 2km west of the town CBD, adjacent to the Municipal oxidation ponds. The site is easily accessible from the existing gravel road from the town to nearby farms. The site is located about 500m from the tributary of the Omaruru River. The site center co-ordinates are -21.42556 15.92361.

Figure 1; locality map showing the existing Omaruru dumpsite

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3.2 Environmental Baseline of the dumpsite

The first step in planning for rehabilitation was the site survey to gather specific information which are presented in the risk index worksheet in the Table below.

Table 1: Risks index worksheet

Attributes	Description
Area of the dumpsite (Ha)	8ha
Age of filling (years)	Older than 30years
Type of waste on site	Mixed (building rubbles, domestic, garden etc.)
Hazardous quantity in waste (%)	<10%
Depth of filling of waste	No filling
Type of underlying soil and geology	Swakop group (granites, limestones, and sandstones)
Site topography	Flat (800m-1000m above sea level)
Annual rainfall of the area	Sporadic (308mm)
Water table depth	
Aquifer type and potential	Porous Aquifer
Distance from nearest water supply sources(m)	More than 2km
Distance to the nearest residential houses/ properties	+/-2km
Distance to the nearest public road	+/-500m
Distance to critical habitats or Protected Area/zone (such wetlands and reserved forest)	Within a Water Control Area (see below)

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According to the Ministry of Agriculture, Water and Land Reform (MAWLR), the existing Omaruru dumpsite is located on a high vulnerability zone of the proclaimed Omaruru Water Control Area named “Omaruru Aquifer.

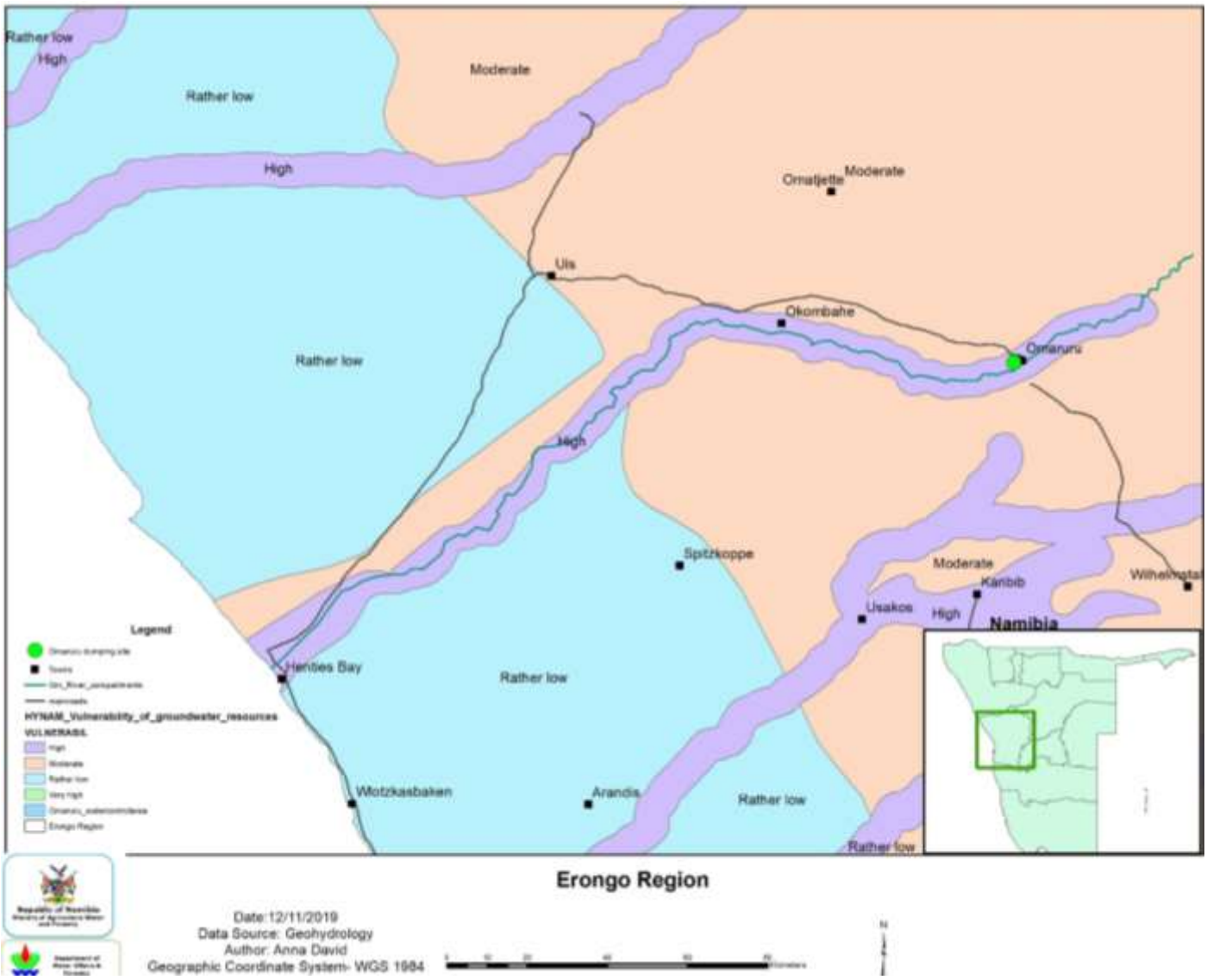

Figure 2: Omaruru Aquifer Vulnerability zoning map (MAWLR, 2020)

The Omaruru Water Controlled Area stretches upstream from the road bridge at the town Center for about 30 km. This is a porous primary aquifer that form alluvial sediments of varying thickness and showing medium to high groundwater potential.

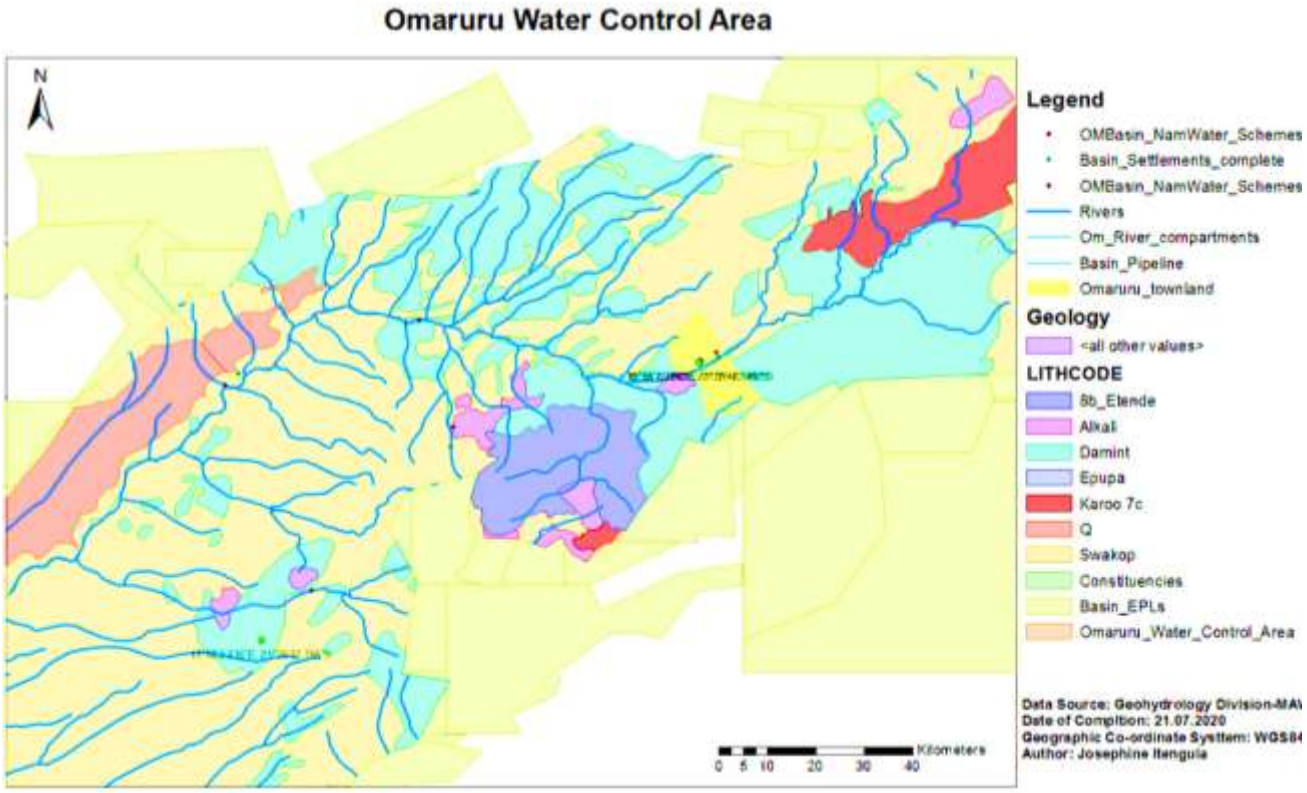

Figure 3: Omaruru Water Control Area extent (MAWLR, 2018)

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3.3 Site context and Status quo

The dumpsite covers approximately an area of about 8ha in extent. This include different compartments of waste streams which range from large heaps and piles to area occupied with windblown litter. The landscape of the area is generally flat intercepted with dry valleys draining toward the north down to the Omaruru River.

Figure 4: View of the Omaruru dumpsite

The site is an open dump with no fences, gates or any supporting infrastructure. Waste is indiscriminately and randomly disposed without any sorting, spreading, compaction or cover. Waste found at site include; Building rubble, general household waste, garden waste and some special waste i.e. car wrecks, electronics etc.

3.4 Waste Management Process

It is the function of the Municipality to remove and dispose any solid waste or other waste under its jurisdiction. Waste collection is done from Monday to Friday by the Municipal team, as per the waste collection Schedule. Waste is collected mainly from residential, institutions, business and public places. Probably due to poor waste segregation from sources, different types of wastes are found mixed together.

Figure 5: Waste stream at the dumpsite

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The waste disposal process onsite includes; open burning and “end tipping” or bulldozing of discarded and burned waste streams. Landfilling and compaction of waste is rarely done, expect for expired or condemned food items which are burned and buried onsite under the supervision of the Environmental Health and Risk Officer or Environmental Health Assistant.

Environmental problems noted on this site include visual nuisances from windblown litter, air quality problems from the burning of waste, ingress by livestock and unauthorized scavenging by residents which include women and children.

Figure 6: Windblown litter in the surrounding

Although the dumpsite is somehow poorly operated, one of the key activities noted on site is the reclaiming of recyclable material by locally based company (Erongo Drum) and local residents. However, due to poor waste segregation, the recycling of waste is not sufficient in reducing the waste stream at the dumpsite. Other challenges are with regard to the lack of appropriate equipment required for the compacting of waste on site.

Figure 7: Recyclables collected by Erongo Drum

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3.5 Rationale for site closure

The rationale behind the site closure is based on the following reasons.

- The site lacks important supporting infrastructures such as fences, gates, guardhouse etc., and there is an absence of proper control for waste disposal. Hence, the site poses serious environmental threats.

- It has been established that the site is located on high vulnerability zone of the Omaruru Water Control Area. If the site continues to operate, it is likely to pose serious risks of groundwater contamination.

- The site does not meet the sitting guidelines of the MEFT; hence, it must be decommissioning in order to achieve the minimum waste disposal standards as specified in the Draft National Solid Waste Management Regulations.

- Delaying in implementing the Decommissioning of the existing Omaruru dumpsite will result in further adverse environmental impacts.

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4. PUBLIC PARTICIPATION

The project was subjected to a Public Participation Process (PPP) as defined in the EMA, No. 07 of 2007 and EIA Regulations of February 2012. The summary of the PPP followed is summarized as follows:

- Public Notification through newspaper advertisements in two separate newspapers (**Namib Times (14 &21 August 2020) and New Era (13 and 18 August 2020**) were issued out to invite registrations and comments from potential Interested and Affected parties (I&APs)
- On-site notices advertising the EIA process were erected on site and at visible and accessible locations close to the site and Public Places around town.
- Invitation letters and BID were sent via emails to relevant stakeholders and registered I&APs
- All I&APs that responded and submitted comments were registered in the project database and their comments captured.
- Due to COVID 19 Regulations on public gatherings at the time, no public meeting was held during the Scoping phase.

Figure 8: Public Notification

Copies of these Public participation documents, advertisements, site notices, notification letters, proof of communication with I&APs, Project Database, and Comment and response report are attached as Appendices to this report. This DRP has been circulated to registered I&APs and stakeholders for public review. Comments received during this period were captured and included in the Final Report.

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5. LEGISLATIVE REQUIREMENTS

The Collection, Disposal, Treatment and Management of solid waste is regulated by several local and international legislations.

Table 2: Relevant Legislations

LEGISLATION	PROVISION AND REQUIREMENTS
1. Legislation of national importance	
Local Authorities Act, No. 23 of 1992 as amended	Provide for the determination, for purposes of local government, of local authority councils; the establishment of such local authority councils; and to define the powers, duties, and functions of local authority councils; and to provide for incidental matters. According to Section 94 of the Local Authorities Act, 23 of 1993 *"the collection and disposal of waste is the responsibility of Local and Regional Authorities.* The Act also gives power to the Local Authorities to establish by-laws that are meant to promote proper waste management within their jurisdictions.
Pollution Control and Waste Management Policy, 2003	Aims to promote among others sustainable development; to prevent and regulate the discharge of pollutants to the air, water and land; to furthermore regulate noise, dust and odour pollution; to make provision for the establishment of an appropriate framework for integrated pollution prevention and control; to establish a system of waste planning and management and to enable Namibia to comply with its international law obligations. **The policy provide framework for a multitude administration on pollution control and waste management in the country. Each ministry identified by the bill shall play its respective roles.**
Environmental Management Act, No.07 of 2007	Ensuring that the significant effects of activities on the environment are considered carefully and in time. To promote the sustainable management of the environment and the use of natural resources by establishing principles for decision making on matters affecting the environment. **Further it states that; all activities of waste management, handling storage and disposal require an Environmental Clearance Certificate.**
Public Health and Environmental Act, 2015	The objectives of the PHE Act are to. • Promote public health and wellbeing • Prevent injuries, diseases, and disabilities • Protect individuals and communities from public health risks • Encourage community participation to create a healthy environment • Provide for early detection of diseases and public health risks

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	Section 2 requires that a). "Every local authority must take necessary reasonably and applicably measures to maintain its local authority area at all times in a hygienic and clean condition" b). Prevent occurrence of a health nuisance, unhygienic condition, an offensive condition or any condition which could be harmful or dangerous to the health of a person within its local authority or the local authority area of another local authority"
Atmospheric Pollution Prevention Ordinance, no. 11 of 1976	To provide for the prevention of the pollution of the atmosphere, and for matters incidental thereto. The Ordinance deals with administrative appointments and their functions; the control of noxious or offensive gases; atmospheric pollution by smoke, dust control, motor vehicle emissions; and general provisions. **According to the Ordinance, the Local Authority shall control and prevent atmospheric air pollution or emission of noxious or offensive gases by smoke.**
Hazardous Substances Ordinance 14 of 1974	This Ordinance provides for the control of toxic substance and thus also relevant for pollution control. It covers for the manufacturing, sale, use, disposal, dumping, importing, and exporting of hazardous waste.
The Soil Conservation Act No.76 of 1969	This Act is providing for the prevention and combating soil erosion, the conservation, improvement, and manner of use of the soil and vegetation and the protection of water sources,
Road Traffic & Transport Act, 22 of 1999	The Regulations are very similar to those of South Africa and also incorporate various South African National Standards (SANS6) standards relating to the identification and classification of dangerous goods and substances, as well as the packing and transportation of goods.
Labour Act , Act No 11 of 2007	One of the objectives of the Act is to "ensure the health, safety and welfare of employees. Chapter 4 of the Act deals with health, safety and welfare in detail. Article 39.(1) stipulates that every employer or person in charge of a premises where employees are employed, must without charge to the employees; a) provide for a working environment that; i) is safe, ii) is without risk to health of employees and, iii) has adequate arrangements and facilities for the welfare of employees. Further provisions deal with the use of equipment and machinery that are safe and pose no health risk to employees, the use of protective gear and equipment, awareness and training about safety on the job, etc.
Atomic Energy and Radiation Protection Act, 5 of 2005	License required for the disposal of radiation source or nuclear material Amended under hazardous substances ordinance Radioactive waste is presently transported across the borders as there is no disposal facility in Namibia.
2. Relevant Legislations of international importance (Conventions)	

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Basel Convention, Framework Convention on Climate Change	Agreed to ensure environmentally sound management of hazardous waste and other wastes through the reduction of their movements, for the purpose of reducing their impacts on human health and environment. The Basel Convention makes specific reference to control of special HCW: sharps, pathological infectious waste, hazardous chemical waste, and pharmaceutical waste and includes the following waste categories. • Clinical wastes from hospitals, health centres, and clinics. • Wastes from the production and preparation of pharmaceutical products • Pharmaceutical waste • Waste from the production, formulation and use of biocides and phyto-pharmaceuticals Namibia has accepted the principal that the only legitimate transboundary shipments of hazardous waste are exported, where the country lacks the facilities or expertise to dispose of the waste categories. This is applicable to the transportation of radioactive waste from Namibia to South Africa. Because suitable facilities are not available in Namibia, provided that the radioactive waste is labelled, temporarily stored and transported according to the United Nations (UN) recommended standards.
Rotterdam Convention	Prescribes the Prior Informed Consent procedures for certain hazardous chemicals and pesticides in international trade. Adopted in 1998, entered into force on February 24, 2004.
Stockholm Convention on Persistent Organic Pollutants	Emphasizes the restriction and elimination of on persistent organic pollutants (POPs), especially the disposal of industrial and medical chemicals. It also provides information for future establishments to re-use, reduce and recycle waste with environmentally friendly technologies e.g. autoclaving. It was adopted in 2001 and entered into force on May 17, 2004.
International Atomic Energy Agency (IAEA)	The IAEA is an autonomous intergovernmental organization within the UN system. The organization provides advice to member states on nuclear power development, health and safety, radioactive waste management, legal aspects of atomic energy, and prospecting for and exploiting nuclear raw materials. The agency has developed safety standards in the area of pre-disposal of hazardous waste, which includes collection, handling, treatment, conditioning, and storage of radioactive waste.
3. Others	
Waste Disposal Site Siting Guidelines, 2017	Provide guidelines and specifications for Sanitary Landfills and Criteria for Site Selection**.**
National Solid Waste Management Strategy 2018	Provides coordination for funding, regulations, action plan for proper solid waste management and facilitate stakeholder collaboration.
Namibia Integrated Health Care Waste Management Plan, 2010	Provide the information to allow health care facilities to establish a good healthcare waste management system consistent with the regulatory requirements of Namibia.

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6. SPECIFICATIONS FOR SITE CLOSURE

6.1 International Risk Classification of disposal sites

With the information necessary to evaluate the site, the following classes can be used to determine the minimum closure and reclamation/rehabilitation requirements. If the site meets one the criteria of the risk class, the site is in that class.

Class C (low risk)

- Low potential of groundwater contamination/migration off site.
- No indicators of the site impacting adjacent land.
- Less than 1,000 people served by the waste disposal ground: and
- No hydraulic connection with any area aquifers.

Class B (Moderate Risks)

- The soils in the area indicate a potential for infiltration and leachate migration.
- The water table in the area is shallow.
- Service population of 1,000+ people.
- There has been an indication of a hydraulic connection with the site and aquifers; and
- There is a water well within 500 metres down-gradient of the site.

Class A (high risk)

- The waste disposal ground served a population of 5,000+ people.
- A hydraulic connection with aquifers has been confirmed; and
- Accepted hazardous waste over the life of the waste disposal ground.

In terms of the above international classification, the existing Omaruru dumpsite can be classified under Class A (High Risk), because it serves more than 5000 people and that, connection with the Aquifer and disposal of hazardous waste during the site's lifespan can be ascertained. This document has therefore been prepared to provide set of procedures for the closure of high-risk disposal site (Class A) in an environmentally acceptable manner.

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6.2 Baseline Risk and Hazard Assessment

Before any closure plan can be developed, a site risk assessment is conducted to assess the existing conditions of the site. The site investigation process was necessary step in the development of a more comprehensive closure and post-closure plan based on the actual conditions at the site and other issues related to the site. Below is a baseline risk assessment for the existing waste disposal site at Omaruru as per current status quo. Although most of these issues could be of general perspective, the ratings provided was based on the existing situation at the Omaruru dumpsite as per site inspection and observations. The identified risks and hazards include *biological, ecological, physical and ergonomist hazards*.

Table 3: Baseline Risk and hazard Assessment for the existing Omaruru dumpsite

No	**Hazard/Risk** Something with the potential to harm: hazards listed should be all those present before controls are in place.	**Possible effects/harm** Where a group of people may be affected differently, for example young people or expectant mothers, identify the separate effects/harm and risk rating.	**Hazard/Risk rating H, M, L** Indicate the rating prior to controls being in place.	**Proposed Mitigation Measure/s**
1.	**Human Health implications** ***I. Disease transmission***	-Biodegradable organic material emit obnoxious odors that cause illness to people living in, or around, them. Since they ferment, they could create favorable conditions for survival and growth of microbial pathogen. -Open dump is often a feeding places for dogs and cats. These pets, together with rodents, carry diseases to nearby homesteads. -Unattended wastes lying around attract flies, rats, and other animals that, in turn, spread diseases.	M H M	No infectious waste observed at the site. Any sch waste to be uncovered during rehabilitation should contained and compacted/capped.
	II. Contamination and infection	-The dumpsite area may become children's sources of contamination due to the incubation and proliferation of flies, mosquitoes, and rodents.	H	The waste heap must be fenced of properly

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	III. Smoke	-Health care waste and other medical waste disposed in dumpsites, mixed with domestic waste, increasing the risk of infection with Hepatitis B and HIV, and other related diseases. -Colored plastics are harmful as their pigment contains heavy metals that are highly toxic. -The smoke generated from burning of waste in the dumpsite becomes a nuisance and a health concern for the nearby community -The smoke from the dumpsite is associated with a number of public health risk such as. a). Respiratory abnormalities b) Abdominal problems c) Ear infection d) Central nervous system e) Blood disorder -These can occur because of inhalation of smoke, ingestion of contaminated items or absorption through skin cells. -Smoke can also cause health problems to animals and other living organisms in the area -Smoke in the surrounding may obstruct traffic flow within the surrounding area.	**M** **H** **H** **H** **H** **H**	No medical waste disposed at the site. If any uncovered, it must be handled by the MoHSS Burning of waste should be controlled Animal must be kept off site during rehabilitation The site is far from busy road, however, burning of waste should be done in a controlled manner.

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	IV. Danger of expired food.	-Expired food in the dumpsite attracts residents especially scavengers such as kids.	**H**	All condemned food items should be compacted and capped in a heap
2.	**Pollution of the environment**	Wind-blown waste i.e. plastic bags are clearly seen in the surrounding. This not only a nuisance to people but also poses a serious risk to animals.	**H**	Collect all windblown litters from the surrounding
3.	**Risks of groundwater contamination**	-There is potential risk of groundwater contamination from heavy metals since the site is not sealed	**H**	Install drainage ditches on the up-gradient sides of the site to divert precipitation/drainage waters away from the disposal area
4.	**Injuries and poisoning during handling**	-Direct handling of solid waste can result in various types of infectious and chronic diseases with the waste workers and rag pickers being the most vulnerable. These are including: skin or blood, eye and respiratory and intestinal infections as well as cancer resulting from exposure to dust or hazardous compounds. -Direct exposure to solid waste can lead to diseases through chemical exposure as the release of chemical waste into the environment leads to chemical poisoning and radioactive hazard. Many studies have established that there is a strong connection between exposure to waste and diseases. -Employees/workers can also be at risks of number of injuries from sharp objects at the dumpsite if not properly protected. -Employees are also at risk of accidents during waste handling, i.e. muscle disorders from lifting heavy containers, infectious wounds from contact with sharp objects or poisoning and chemical burns from chemical waste mixed with general waste.	**H** **H** **H** **H**	All employees/contractors must be equipped with Personal Protective Clothing Employees to work on the site must be trained and made aware of danger and personal risks associated with the work

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6.3 Step-by-Step Decommissioning process

STEP 1: Planning and Design

The EAP will prepare the DRP and submit to the competent authority (MEFT)

STEP 2: Recording and Approval of DRP

The authority (MET) will record the submitted DRP and give approval **(WE ARE HERE)**

STEP 3: Notification and Awareness

Before the formal site closure, the proponent will advertise in the local newspaper and by Public Notices indicating the intended closure in advance in terms of the date of closure and alternative arrangements for disposal. A sign should be placed at the site stating; the date of closure and alternate arrangements for the disposal of refuse. The site staff (contractors) should be trained or briefed and provided with well-defined roles and responsibilities.

STEP 4: Site clean-up

Before rehabilitation commence, site must be closed for dumping. All activities should be conducted in a manner which prevents the discharge of material or pollution of surface or groundwater, air or land environment in accordance with the Public and Environmental Health Act, 2015. Operations should be conducted in such a manner to ensure that uncovered hazardous constituents are properly handled and timely disposed.

- ✓ Waste should first be sorted based on physical appearance
- ✓ Remove all infrastructure no longer required, from the site.
- ✓ Remove accessible scrap metal to recycling.
- ✓ Containerized chemical waste.
- ✓ Collect all windblown litter and debris from the site, the access roads, and from adjacent property where necessary and to the extent possible.
- ✓ Implement rodent and nuisance control measures where a problem is identified.
- ✓ Rehabilitation work should start from the most end tip toward the front

Access: Public access to the site should be prohibited, which can be accomplished by breaching the access road. The Municipality shall appoint a representative to supervise the rehabilitation process and ensure compliance with the DRP.

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STEP 5: Shaping, Grading and Capping

The shaping and capping of the site is aimed at preventing storm water from coming into contact with the waste, prevent uncontrolled escape of landfill gas and odours or the entry of air into the wastes, and provide protection for the wastes and any contamination. The existing waste heaps (building rubble and residues) should be covered, compacted and capped. The cover material should be contoured to allow for drainage away from the site, allowed to settle and re-graded if necessary. The final cover or capping material should at least be 500mm thick. The recommended capping material for the final cover is clay material or any material with a low permeability and be compacted according to acceptable engineering practices to ensure the overall structural integrity of the final cover.

Final cover and re-vegetation

Final cover may form part of a special capping design and, as is the case with intermediate cover, must be able to support vegetation.

- ✓ Install final cover system to minimize the infiltration of liquids and soil erosion.
- ✓ Shape and grade to the extent possible to achieve the required finished grades prior to backfilling. The level of difficulty in achieving a stable grade will vary according to the condition and natural slope of the site
- ✓ Grade the final cover to accommodate settling of the waste, prevent surface ponding and seepage, and direct surface drainage away from the waste disposal area
- ✓ Cover all refuse evenly with 60 cm of backfill material.
- ✓ Seed to initiate vegetation cover, reduce erosion potential and improve the appearance of the site.
- ✓ Re-vegetation must match the vegetation type which previously existed

Erosion Control

- ✓ Install drainage ditches on the up-gradient sides of the site to divert precipitation/drainage waters away from the disposal area and to prevent impact from future overland flow.

Location record

- ✓ Delineate waste disposal site boundaries and access route using available existing and historic information, and geographic positioning system coordinates.
- ✓ Install **"No Trespassing"** and **"No Dumping"** signage at the former site entrance stating the applicable fines for offense. All signage must be weather-proof.
- ✓ A 1,8m high wired fence and lockable gate should be constructed for access control purposes.

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STEP 6: End use planning

The end-use plan shall guide what would be the most suitable land use for the area. The choice of type of end use is dependent on the urban or rural spatial planning of the Townlands in which the site is situated. The Municipality of Omaruru should prepare a detailed designs to determine the suitable end use for the site after closure.

STEP 7: Post closure care

It remains a responsibility of the proponent to monitor the site after rehabilitation to prevent any risk of public health and environment. Post-closure care period typically 30 years. These entails the following.

- Must maintain integrity and effectiveness of cover
- Must maintain leachate collection
- Must monitor groundwater
- Must maintain and operate gas monitoring

- Long term uses of the closed site should be such that the security of the wastes deposited in the site is not breached.
- Due to the presence of heavy metals from tins, cans and scrap metals, the soil at the will contaminated and may not be suitable for residential use
- Optional future use may include; public open spaces or light industrial.

6.4 Monitoring and Auditing

Upon closure and rehabilitation, the Municipality of Omaruru or the EAP shall provide a summary report describing the work done to close/decommission the site, including as built drawings pre- and post-closure, the existing condition, and the anticipated future condition relating to environmental concerns.

A post closure monitoring plan shall be developed to ensure that certain critical aspects are monitored continuously (See Appendix 3). In order to monitor the rehabilitation of the Omaruru dumpsite, the Ministry of Environment undertake the audits. This can be achieved by using a checklist relevant to the aspects that will be monitored must be created and used during the audit. Furthermore, photographs must be taken to indicate site conditions.

Alternatively, the Municipality shall undertake the audit internal and submit to MEFT, the findings of the audits including with photographic records together with quarterly reports. The reports must indicate the following minimum information: Date/s of audit, Name of auditor, Areas audited, Areas of concern and suggested corrective measures.

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7. IMPLEMENTATION OF THE DRP

The implementation of the DRP is an ultimately responsibility of the Municipality of Omaruru. However, other key stakeholders and individuals will play various vital roles to ensure sound environmental management during each phase. The roles of the different role-players are outlined in the Table below.

Table 4: Responsibilities for DRP implementation

Role Player	Responsibility
Proponent: Municipality of Omaruru	✓ The Developer should appoint an Employer's Representative (ER) to oversee all aspects of these decommissioning and rehabilitation phases (including all contracts for work outsourced). ✓ Any official communication regarding work agreements is delivered through this person. ✓ Notify the EAP and MET of the progress of the Decommissioning process ✓ Assisting the Contractor in finding environmentally responsible solutions to problems with input from the EAP where necessary; ✓ Ordering the removal of individuals and/or equipment not complying with the EMP;
Environmental Assessment Practitioner (EAP)	✓ Bi-weekly site inspection of all decommissioning and rehabilitation activities with regard to compliance with this DRP; ✓ Monitor and verify adherence to the DRP (audit the implementation of the DRP) and verify that environmental impacts are kept to a minimum; ✓ Taking appropriate action if the specifications of the DRP are not adhered to; ✓ Assisting the Contractor in finding environmentally responsible solutions to problems; ✓ Advising on the removal of person(s) and/or equipment not complying with the specifications of the DRP in consultation with the ER; ✓ Supervise and oversee the decommissioning and rehabilitation of the site and notify the Environmental Commissioner. ✓ Compile final report after closure
Ministry of Health and Social Welfare	✓ Periodically do onsite inspection during the commissioning and rehabilitation process. ✓ Collection and disposal of health care waste ✓ Assist with first aid
Ministry of Environment and Tourism	✓ Record, approve the DRP (with conditions, if need be) ✓ Monitor compliance to the approved DRP ✓ Should conduct site visit before and after site closure
Ministry of Agriculture, Water and Land Reform	✓ Monitoring of Rehabilitation ✓ Give guidance and approval of end-use of the site

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8. CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

In summary, it has been well established that the existing Omaruru dumpsite pose serious environmental risks. Hence, delaying in implementing the Decommissioning of this site will result in further adverse environmental impacts arising.

The decommissioning process entails the preparation and approval of the Decommissioning and Rehabilitation Plan (this document). Thereafter commencement with the actual decommissioning and rehabilitation process as outlined in this document. This DRP presents the likely activities to be undertaken for decommissioning, and the rehabilitation of the site.

Upon approval by the authority (MEFT), this DRP shall be used as a guiding, obligatory and legally bidding document. Transgression from this document is punishable by law as prescribed in the Environmental Management Act (EMA) No. 07 of 2007. Moreover, any deviation from this DRP shall be reported to the EAP in advance and be recorded in the summary or closure report to be submitted to the authority.

It is anticipated that the site can be rehabilitated successfully and used for other numerous land uses. However, the soil of the site is believed to be contaminated and hence not suitable for residential or agricultural production activities. Land use activities that are suitable for the after use of this site are passive or recreation activities and industrial use.

8.2 Recommendations

It is recommended that the Environmental Commissioner approves this DRP to enable the decommissioning of the existing Omaruru dumpsite and to allow for the establishment of a new landfill site in Omaruru.

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9. REFERENCES

- Environmental Management Act Regulations, Ministry of Environment and Tourism, 2007
- Government Gazette. No.5367 Promulgation of Water Resource Management Act, 2013 (Act No. 11 of 2013 of Parliament), 2013, Windhoek, Republic of Namibia.
- Integrated Solid Waste Management Policy. Ministry of Environment and Tourism (MET), 2018
- Mendelsohn, J., Jarvis, A., Roberts, C. & Robertson, T. 2002. Atlas of Namibia. A Portrait of the Land and its People. Cape Town. David Philip Publishers.
- Namibia Integrated Health care Waste Management Plan., Ministry of Health and Social Services, 2010
- Rushborrok, P. 2001. Guidance on minimum approaches for improvements to existing Municipal Waste Dumpsites, *WHO Regional Office for Europe*, Copenhagen, Denmark.

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10. APPENDICES

10.1 Appendix A: List of I&APs

10.2 Appendix B: Post Closure Monitoring Checklist

10.3 Appendix C: Proof of Consultations

10.4 Appendix D: Financial Provision of site closure

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Appendix A: Interested and Affected Parties Register

ORGANISATION	REPRESENTATIVE AND TITLE	CONTACT DETAILS
Municipality of Omaruru	Mr. Josef Haipinge **Manager: Technical Services**	jnhaipinge@gmail.com
	Mr. Jesaya Andreas **Environmental Health and Risk Officer**	jesayandreas@gmail.com
	Mr. Engelhardt Ndjiharine **Environmental health assistant**	motjari@gmail.com
Ministry of Agriculture, Water and Land Reform	Bernhardt Beatty Haraseb **Basin Support Officer**	**+264 81 293 8396** bbharaseb@gmail.com
	Dr. Estelle O State Veterinarian	estelle.oosthuysen@gmail.com
Ministry of Environment, Forestry and Tourism	Likius Iiyambo Directorate of Forestry	iiyambo2883@gmail.com
	Ottilie Nghinyangelwa Directorate of Forestry	onghinyangelwa@gmail.com
	Rose maria Amulungu	rossy.amulungu@gmail.com
Ministry of Health and Social Services	Ms. Ester Nyathie	nononyathie@gmail.com
Erongo Red	Mr. S Araeb	saraeb@erongored.com.na
Erongo Drum	Mr. Leon Rheeder :	**0812420006**
IAPs	MULLER Sandra (ORANO)	sandra.muller@orano.group
	Ignatius Kauvee	ikauvee@gmail.com

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Appendix B: Post Closure Monitoring Checklist

Environmental Aspects	Objective	Description	Frequency and Record keeping
Firebreak	Prevent fire outbreaks	A 5 meter fire break must be maintained around the site	Monthly Record keeping
Soil erosion	Prevent soil erosion especially from slope or capped are	Monitoring of the site to ensure that topsoil is not eroded especially on the slopes of the capped cells and in other vulnerable areas.	Weekly (Regularly during rain seasons) Visual observations
Water quality	Prevent contamination of surface runoff and groundwater aquifers	Surface and groundwater monitoring in accordance with the site permit conditions for closure.	Twice a year Sampling from nearest boreholes
Access Control	Control illegal access or dumping	The fence and gate should remain intact and the site must not be accessed by unauthorized persons.	Monthly inspections

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