ENVIRONMENTAL MANAGEMENT PLAN

AUGUST 2020

NKURENKURU
DESIGNATED DISPOSAL SITE

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Nkurenkuru Town Council

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The Nkurenkuru Town Council Designated Disposal Site Draft Environmental Management Plan

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1. BRIEF INTRODUCTION

1.1. Nkurenkuru

Nkurenkuru was declared as a settlement area in 1999. It was later proclaimed as a town in 2006 and the first ever town council members were officially sworn in on the 27th of March. This beautiful young emerging town is situated approximately **135** kilometers west of Rundu in the Kavango West region and strategically located alongside the Okavango River linking Kavango West region with Kavango East, Ohangwena and Oshikoto regions and via Katwitwi border post to the most densely populated area of Kwando Kubango Province in Angola. Nkurenkuru town is estimated to have a population of around +- 15,000 inhabitants in the Republic of Namibia. The name Nkurenkuru is originated from two words or nouns which are **"Nkure"** which means endpoint whereas **"nkuru"** means old.

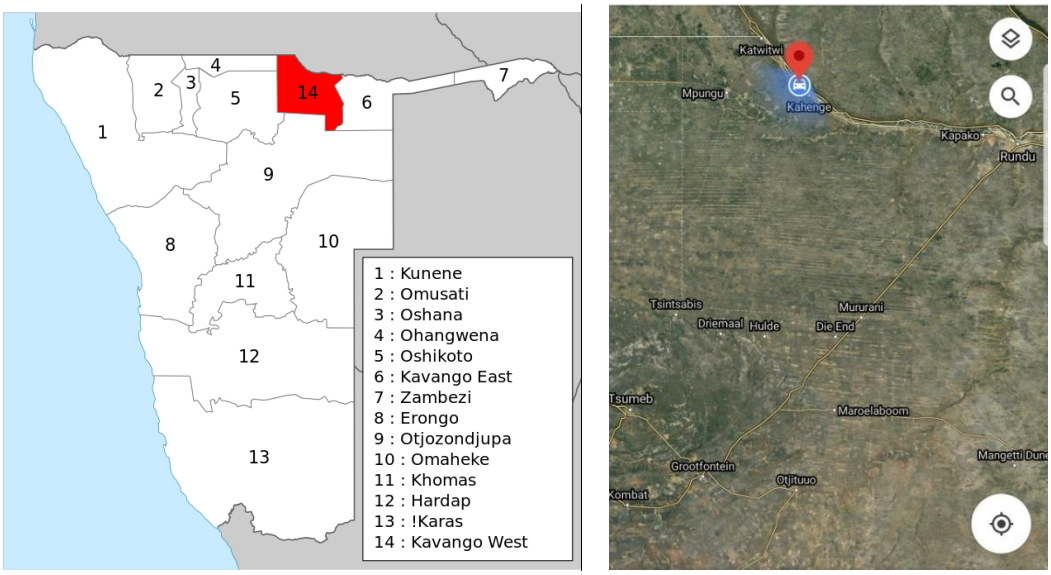


Figure 1: Location of Nkurenkuru in Kavango West Region

Historically, Nkurenkuru is a unique town in itself in terms of historical events that unfolded many years ago. Nkurenkuru was the first colonial administrative seat in the Kavango region before the administrative seat center was relocated in 1936 to Rundu until today. It was also the first entry point of the two major denominations, Roman Catholicism and Lutheran Protestantism into the Kavango region. Nkurenkuru is indeed

the seat of the vaKwangali Traditional Authority and the Permanent Royal Palace of the Kings and Queens. The currently oldest deliverances date around the middle of the 18th century, when Uukwangali queen (*Hompa*) Mate I. and her people left their former area of settlement on the Kwando River of Zambia near Mashi and moved about 500 km to the west into an area near Makuzu 17°29′0″S 18°28′0″E, around 20 km to the northwest of Nkurenkuru. Successor of Queen Mate I. became *Hompa* Nankali (1750-1775).

The town has become the residential, business and administrative capital town of the Kavango West region with an increasing influx of people into the town every day. Nkurenkuru Town Council portrays itself as a business-friendly Council that encourages investors from local, national and international to invest in the town and realize positive profits from the rapid growth of the town. Nkurenkuru are predominately small scale business and various residential. The majority of areas are covered with indigenous and semi-indigenous vegetation. The overall cumulative impact of the proposed Townships and Waste Site on the natural aspects is expected to be of medium to low significance.

1.2. The Draft EMP Rationale

Public Notices were published early in February 2013 (by the Department of Environmental Affairs within the Ministry of Environment and Tourism Environmental - MET, and through the Office of the Environmental Commissioner) requesting members of the public who are operating waste disposal sites to comply with the Environmental Management Act (EMA) No.7 of 2007 by getting their respective waste disposal sites approved. Further correspondences between the permanent secretaries of MET and Urban and Rural Development encouraged all local authorities to embark upon improved waste management practices during February - April 2015. Note Appendix 1. Equally, the National Solid Waste Management Strategy that aims at enforcing improvements in municipal waste disposal standards.

The EMA empowers the MET Minister to declare a site to be a waste disposal site by notice in the *Gazette* or by *Regulation* where a waste disposal site already exists in terms of any law. By *Regulation*, an Environmental Management Plan (Draft EMP) needs to be submitted to the Environmental Commissioner for existing waste disposal sites, whereas an Environmental Impact Assessment (EIA) is required for new waste disposal sites.

Notable is that any person who discard or cause to be discarded waste or dispose of it in any other manner except at a disposal site declared or approved by the Minister, or in a manner or by means of a facility or method and subject to such conditions as the Minister may prescribe commits an offence and is on conviction liable to a fine not exceeding N$500 000 or to imprisonment for a period not exceeding 25 years or to both such fine and such imprisonment. The Nkurenkuru Town Council operates an existing disposal site and have to comply to the EMA by obtaining an Environmental Clearance Certificate (ECC) and approval or declaration of its existing waste disposal site, hence this Draft EMP.

1.3. Legal Requirements

The table below lists some of the various main environmental and developmental policies, plans, programmes and legislations clauses that are relevant to the operation of a waste disposal site.

LEGISLATION/POLICY	APPLICABLE CLAUSE	COMMENTS
The Constitution of the Republic of Namibia	Article 91 calls for all to actively promote and maintain environmental welfare of all Namibians by promoting sustainable development.	The waste disposal site should not pose a threat to the natural and human environment.
Vision 2030	Promotes environmental sustainability as one of the principles that underpin the national development agenda.	The waste disposal site should contribute to Namibia's development plans of industrialization and social welfare by the responsible utilization and disposal of waste.
Environmental Management Act (EMA) No. 7 (Act 7 of 2007)	Section 5 of the EMA Draft empowers the MET Minister to declare a site to be a	The waste disposal site should be approved and declared by notice in the *Gazette* or by

	waste disposal site.	regulation as a waste disposal site.
Environmental Impact Assessment (EIA) Regulations	Provide guidelines for the EIA/Draft EMP process of listed activities that cannot be carried out without an ECC.	An approved Draft EMP should be implemented and progress reported on during the operation of waste disposal site as a listed activity.
Water Act 54 (Act 54 of 1956)	Controls the prevention of surface and groundwater pollution.	The adherence to the Draft EMP operational & maintenance recommendations will minimize the pollution risk of underground as well as surface water.
The Atmospheric Pollution Prevention Ordinance of 1976	This Ordinance generally provides for pollution prevention of the atmosphere.	The covering and burning of waste should be regulated to minimize air pollution.
Hazardous Substance Ordinance (No.14 of 1974)	Addresses the manufacture, sale, use, disposal, dumping, import and export of hazardous substances, and is administered by the Minister of Health and Social Services.	The disposal of hazardous waste at this waste disposal site should be conducted such not to negatively impact on the health and safety of all stakeholders.
The Public and Environmental Health Act 1 (Act 1 of 2015)	Prohibits the generation of a nuisance i.e. noise, fumes and odours.	The waste disposal site should operate during the day. The covering and burning of waste should be regulated to minimize odours, fumes and noise.
The Labour Act of 1992	Promotes the health and safety of employees.	The waste disposal site users' health and safety should be minimized through the provision of personal protective equipment (PPE) and erection of appropriate signboards.
National Solid Waste Management Strategy	Objective 4 of Phase 2 requires the proper management of municipal waste disposal.	Task 2.4.1 addresses the implementation of waste disposal standards at local authorities.

Table 1: Policies, plans, programmes and legal framework relevant to the town council's waste dumpsite.

NOTE: APPENDIX 1 ON MINISTERIAL CORRESPONDANCE CONCERNING WASTE MANAGEMENT IN LOCAL AUTHORITY.

1.4. The Draft EMP Objective

This Draft EMP describes the processes that the Nkurenkuru Town Council and associates are recommended to follow in order to maximize compliance and minimize harm and threat to human health and the environment as a result of the present waste disposal site operations. This plan will also help the Nkurenkuru Town Council to map out progress toward achieving the recommended objective through continual and incremental improvements as illustrated below.

The overall primary objective of this Draft EMP is to incrementally upgrade the present council waste disposal site from a "Designated Dump Site" to a "Designated Disposal Site" during the next five years that is 2020–2026.

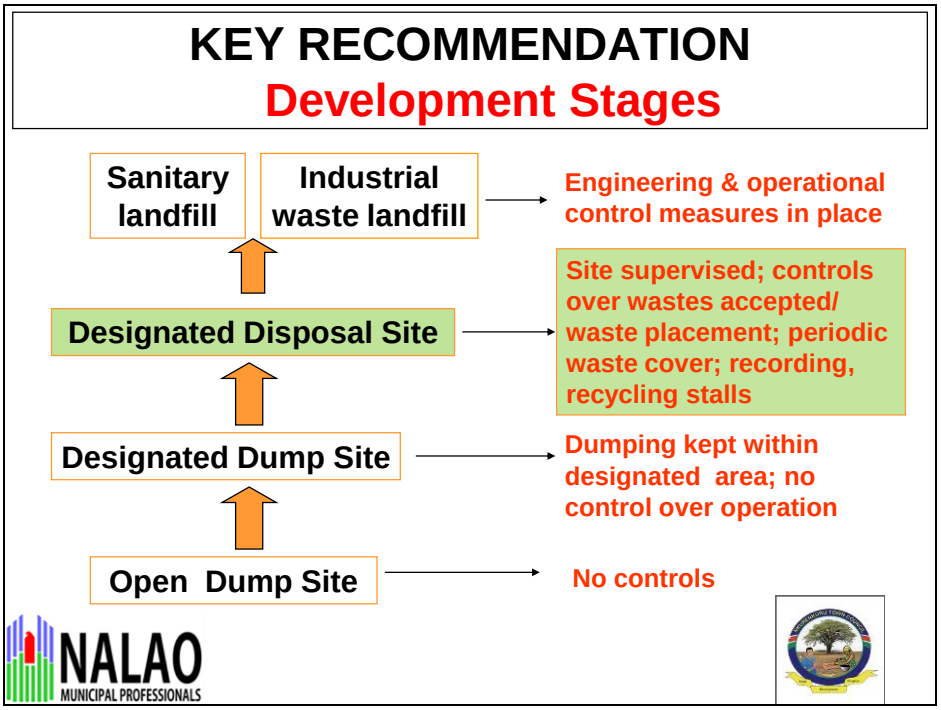


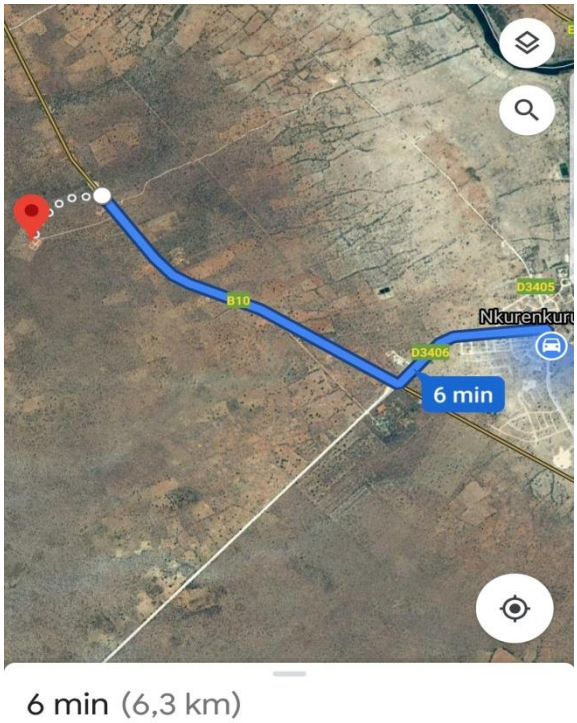
Figure 2: Waste disposal site improvement stages

The Nkurenkuru Town Council can achieve this objective and minimize significant adverse activities that have the potential to impact negatively on the environment and public health. It can also be able to meet the requirements of relevant national and local sustainable development plan, programs and policies by implementing the detailed outlined operational and management guidelines as recommended in this Draft EMP.

2. NKURENKURU TOWN COUNCIL DUMPSITE

2.1. General Background

The present municipal dump site, of approximately 4 hectares in size, is in Kakuro village out of Nkurenkuru township area. The site is operated by the Nkurenkuru Town Council for the past 4 years. The site is located approximately 6.3km west of the town's Central Business District (CBD).



Map 1: *Location of the Nkurenkuru Town Council dumpsite*

This council dumpsite, which accommodates all solid waste types generated within the town of Nkurenkuru, was generally and perhaps chosen on the strategic distance from formal residential areas and the CBD rather than on environmental. From the hydrological assessment perspective, no major geological structures that will enhance groundwater recharge or flow are evident on the site and will not pose any long term negative effects on the hydrological cycle. The site was established in 2016.

***Pictures**: The Nkurenkuru dumpsite (Photos by NHEF-NK3 Team)*

The site is fenced off, with access control, security guard but no lock. No scavengers allowed in the site, also because the site is far from residential area. There is a group of registered and approved recyclers collecting reusable items and recyclable materials respectively, which they sell to Rent-A-Drum. Management and operations are minimal at this existing dumpsite as operating practices do not include coordinated waste placement or compaction or the application of daily cover, but susceptible to daily ad-hoc offloading, daily open illegal burning and exposure to disease vectors and safety risk conditions. The Nkurenkuru Town Council waste disposal site is thus considered a designated dumping site rather than a designated disposal site, hence the objective of "*moving from a dump site to a disposal site*". It is however worthwhile to mention the attempts that were made by the Nkurenkuru Town Council in the stockpiling of waste into heaps as well as promoting recycling activities at this dumpsite, which activities can be improved upon.

2.2. The Receiving Environment

7.1. Climate

According to the Nkurenkuru Environmental Scoping and Assessment, 2013, the Nkurenkuru area is characterized with a semi-arid highland savannah climate typified as very hot in summer and moderate dry in winter. The highest temperatures are measured in December with an average daily temperature of maximum 31ºC and a minimum of 17ºC. The coldest temperatures, conversely, are measured in July with an average daily maximum of 20ºC and minimum 6ºC. The prevailing wind direction is

expected to prevent the spread of any nuisance namely noise and smell. The predominant wind in the region is easterly with westerly winds from September to December. Extreme winds are experienced in the months of August and September and thus significant wind erosion on disturbed areas is visible. The annual average rainfall for the area and surroundings is 500mm to 600mm. The majority of rainfall is experienced in the summer months. Rainfall in the area is typically sporadic and unpredictable however the average highest rainfall months are January to March.

Hydrological Components

The area where the site is located has generally a low groundwater potential from a permeability and yield perspective (Christelis & Struckmeier, 2001). The depth of the aquifer is approximately 70m deep. However, groundwater is one of the important water sources and the protection thereof should be a high priority. Waste Site will not pose any long term negative effects on the hydrological cycle.

Vegetation

Nkurenkuru is a forested area that lies within the Tree Savanna and (Dry) Woodland as defined by Giess (1971), more recently called the North-eastern Kalahari Woodland by Mendelsohn et al (2002). This is largely an area of broadleaved woodlands on Kalahari Sands and comprises some of the densest cover of broadleaved trees in Namibia. Plant species richness in the Okavango region is high due, in part, to a diversity of habitats (e.g. wetlands, riverine forests, specialised habitats on quartzite in the Andara area and dry deciduous woodlands), but also to incursion of tropical species down the Okavango River). Endemism is not very high, with many of the species widely distributed north and east of our borders, but many of the species that occur there, particularly the large trees, are economically important for timber or food security.

Physical geography: Nkurenkuru is located about **135** kilometers west of Rundu in the Kavango West region and strategically located alongside the Kavango River linking Kavango West region with Kavango East, Ohangwena and Oshikoto regions and via Katwitwi border post to the most densely populated area of Kwando Kubango Province in Angola. The Okavango River forms an important source of water and food security for the population of Nkurenkuru.

Plant and animals: much of the wildlife that used to occur along the Okavango river in around Nkurenkuru area has now disappeared due to the cleaning of land and uncontrolled hunting. Most of such animals are now in Mangetti National Park which is situated about 230 kilometers south-west of Nkurenkuru. The wildlife species include wild dogs, African wild cats, African Buffalo and Elephants. Birds species include the Lappel-faced vulture, Bateleur, Tawny Eagle and Striped Kingfisher. In the Okavango river, fish are also very diverse and abundant due to the wide habitant diversity, the river have about 90 species of fish. The river also has a good population of Hippopotamus and Crocodiles. Note should be taken that a significant number of these flora and fauna species are absent at the existing dumpsite as the site is already environmentally disturbed through waste dumping and burning activities.

2.3. Public Health, Safety and Nuisance

As per the description of the current operations of the dumpsite in Section 2.1 above, the key environmental and public health impacts emanating from the dumpsite are summarized below:

- **Public health and safety threats**

Current operations at the site can seriously affect the personnel and recyclers operating on the site, because of the burning of waste. The health of recyclers and personnel on the site are also at risk as they are able to collect and consume food products that could be trapped within general household wastes. The site can also lead to an outbreak of diseases as the current conditions on the site are conducive to the breeding of vectors such as rodents.

- **Air pollution**

Currently waste at the site is burned indiscriminately and illegally by recyclers on the directive of Council staff. This smoke affects the air quality and well-being of the site

users and recyclers. Organic waste usually produces bad rotting smells because waste is not systematically buried and covered.

- **Visual impacts**

The current operations at the dumpsite affect the aesthetic value of the surrounding area. This is mainly due to the unorganized manner in which the waste is dumped.

- **Pollution of underground water resources**

The dumpsite has a slight potential of polluting underground water resources in the same catchment area. The surface run-off water from the landfill site and its drainage path may pollute the area and this may be risks and should be investigated further. Installation of monitoring borehole is therefore recommended.

- **Socio-economic impacts**

It is a common trend nowadays to promote economic activities at a disposal site. Such activities include the recycling of waste and creation of employment opportunities (e.g. security, caretakers, recyclers etc.) as a result. Currently there is a formalized and controlled small scales recycling activities and thus not maximizing recycling economic benefits as detailed under Section 3.2.5 of the Draft EMP. The Nkurenkuru Town Council can also generate income from the site (e.g. establishment of waste disposal tariffs for businesses) which can help to sustain the Council's operational and maintenance measures.

3. RECOMMENDED MANAGEMENT ACTIONS

3.1. Disposal Site Infrastructure Layout Plan

The site infrastructure layout plan below is recommended in order to meet the Nkurenkuru Town Council's organizational effectiveness namely *suitability* of the layout to the current situation; *acceptability* of the layout by the majority of stakeholders and *feasibility* to the council and its community economic-base in constructing and maintaining the infrastructure. This recommended layout plan will serve as a major mitigation measure in addressing the negative environmental and public health impacts emanating from the dumpsite and in upgrading the status of the site to a disposal site.

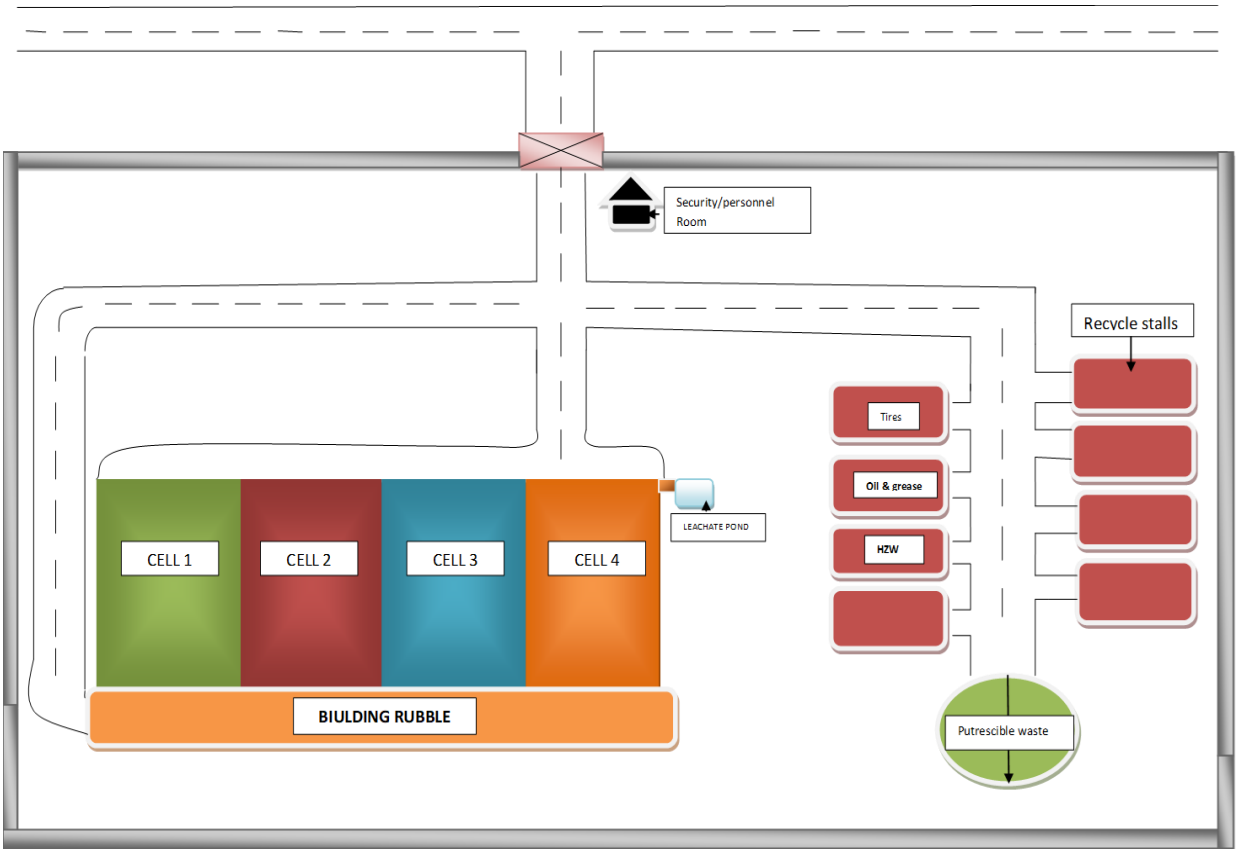


Figure 3: Simplified drawing of the disposal site layout plan

3.1.1. Buffer and Access Road

Signage should be improved to provide direction to customers and the public to the public entrance of the disposal site. A ***two-way access road*** is in place, but need to be maintained, graded and widened to ensure that waste trucks and site vehicles will drive over ***hard-surfaced*** roads to the working face. A ***buffer zone*** is good and away from residential and nearby plots, it is therefore recommended that is should be maintained. The current location of the site has a fairly reasonable buffer that is more than 50m.

3.1.2. Entrance Control Facilities

Controlled access is good with a ***fence, security gate and a "non-authorized entrance" signage***. However, the name and contact ***details of the disposal site operator*** as well as ***operation hours*** should be ***displayed*** at the site entrance. A site office for the site contractor/security is in position ***contorting traffic*** entering the site. It is also

recommended that ***water and electricity*** be availed to the security/contractor's office and all other site's facilities were possible.

3.1.3. Weighbridge

An accurate record of waste inputs is essential for effective waste management and the installation of an on-site weighbridge, as a long-term option, will be the best means of providing such data. However, due to the importance of waste quantification, it is recommended that the "*Typical Daily Waste Composition Recording Sheet*" – note Appendix 2 –be used as a template for completed by site contractor/security at the access control point/site office. Further note Section 3.2.3 below on *Measuring and Recordkeeping*.

3.1.4. Emplacement Cells

Two emplacement cell types are recommended for logistical and practical emplacement, compaction and possible daily covering of waste namely:

- Creating an elevated ***ramp cell*** of all the existing old waste, where this waste is stockpiled and compacted into a one 2-3 meters high cell for and coverage.

THE NKURENKURU TOWN COUNCIL IS RECOMMENDED TO UNDERTAKE ONE MAJOR EARTH MOVING EXERCISE TO AFFECT THE RECOMMENDED DISPOSAL SITE LAYOUT, MORE SPECIFICALLY THE EMPLACEMENT CELLS.

3.1.5. Recycling Stalls

Three to four (3-4)shaded recycling stalls should be constructed to enable litter pickers/recyclers to sort through the waste without interfering with the waste offloading operation in a more safe and hygienic set-up. Income can be generated for the lease of these stalls. ***Signage*** within the facility will provide direction for public to the ***reuse - recycling stalls***. This will increase the lifespan of the disposal site.

3.2. Daily Operations and Maintenance

Again, *suitability*, *acceptability* and *feasibility* were the main guiding principles that were considered in order for the council to meet its organizational effectiveness in implementing this EMP. The recommended human resources organogram depicted below and respective responsibilities; the daily operational and maintenance plan below will serve as mitigation measures in addressing negative environmental and public health impacts emanating from the dumpsite and in upgrading the status of the site.

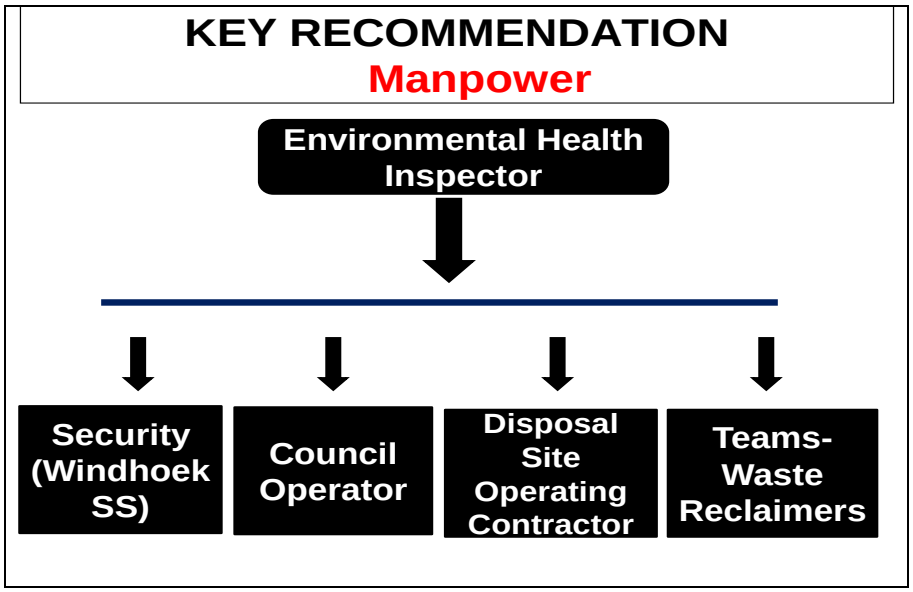


Figure 4: Minimum recommended human resource requirement

3.2.1. Manpower and Key Performance Areas

The minimum manpower recommended for a well-managed site is:

Environmental Health Inspector - The present council employer will have the overall responsibility in ensuring the implementation and adherence to this Draft EMP and in accordance with the required legal requirements and relevant national policies, plans and programmes. The inspector will thus be accountable to the Council for the effective and efficient management and operation of the site in terms of his/her job description.

Disposal Site Operating Contractor (DSOC) - The DSOC will be coordinating and supervising the overall operations at the disposal site. This will include activities such as regulating and controlling gate access into and out of site; recording and keeping

records of waste types and quantities entering and leaving the disposal site; cleaning, inspecting and reporting defects and conditions of the disposal site fence; reporting non-compliances and making improvement suggestions to the Environmental Health Inspector.

Security Guard and Traffic Controller (SGTC) - The SGTC will be controlling legal and illegal access/entries to the disposal site; patrolling the disposal site and fence; directing and guiding vehicles to respective disposal areas and cells; prevention (and were possible regulation) of waste burning, and reporting any non-conformities or defects to the DSOC and the Inspector. *It is recommended that the present council security services arrangements with* ***Windhoek Security Services*** *be utilized and adding the above mentioned SGTC requirements as part of an amended contract agreement with Windhoek Security Services and or any such future contracting agreements.*

Municipal Earth Moving Equipment Operator (MEMEO) - The establishment, maintenance and covering of emplacement cells will be performed by the MEMEO on instructions of the Environmental Health Inspector. The MEMEO will thus directly be accounting and reporting to the DSOC.

Waste Reclaimers (Pandureni Group) – It is recommended that the council assist the present scavengers on site to organize themselves into recognized Waste Reclaimers and to create a conducive environment for them and further straighten their relationship with Rent-A-Drum and other recycling companies. These Waste Reclaimers will aid Council guarding and controlling or reporting irregulars in order to safeguard their socio-economic interests. The Waste Reclaimers will be performing recycling activities on site on instructions of the Inspector and will thus directly be accounting and reporting to the Inspector.

3.2.2. Access Control and Maintenance

Access should be controlled to minimize unauthorized human and animal presence, and vehicular traffic as well as unauthorized and illegal dumping and burning within the disposal site by:

- Preventing unauthorized entrance. The site should have dedicated and trained staff on-site during and after operating hours. The gates are to be locked to prevent unauthorized access during non-operating hours. Properly designed and maintained public waste disposal and/or recyclable material bins situated outside the main gate may be provided for after-hours use.
- Visually inspecting and recording types and quantities of waste loads entering and leaving the site.
- Directing vehicles to respective emplacement and offloading areas.
- Inspecting perimeter fence and gates for damages. Reporting and or making repairs were necessary.
- Inspecting access roads, entrance areas and perimeter fence for loose trash, and weekly clean-ups as necessary.
- Inspecting site access road for damage from vehicle traffic, erosion, or excessive mud accumulation. Maintaining entrance and internal roads as needed by grading at least on a monthly basis.
- Scavenging of food waste is to be prevented. The salvaging/reclaiming of recyclable or re-usable wastes should be encouraged by providing areas and facilities for separation of recyclable or reusable materials.
- Open burning of typical domestic garbage and waste at the disposal site is strictly prohibited. Open burning of other combustibles should generally be discouraged. Controlled burning may be allowed in consultation and approval by the Inspector.

3.2.3. Measuring and Recordkeeping

It is good practice to record both on ***entry and exit*** from the site and accurate record of waste inputs is essential for effective waste management. It should be noted that quantities of waste being generated in any developing town such as Nkurenkuru is

expected to grow. It is thus important to measure daily and seasonal waste streams data variations as well as the generation rate of municipal solid waste at varying points in the chain through representative surveys of households and at any transfer, recycling, treatment and ***disposal sites***. This will enable the council solid waste management services to cope with all situations and to feed data into the current municipal Draft Waste Management Plan.

Records of waste deliveries to the site should be kept, showing who delivered the waste, of ***what type, how much, when and by whom***. These records are particularly important if the council decides to charge waste generators for their waste services and such records will equally be vital to the re-design or upgrading of the existing site or for the design of a new landfill site when required. Manuel waste estimations and recording is recommended (note Appendix 2 for a typical daily waste recording sheet for appropriate editing and usage) while a decision on the construction of the weighbridge is been considered and planned for accordingly at a long-term option.

3.2.4. Emplacement and Co-Disposal

It is recommended that operations at the working phase be conducted in a manner that allows the prompt and efficient emplacement and or offloading of waste through measures such as:

- Vehicles transporting solid waste arriving at the waste disposal working face will be directed to an offloading area by on-site personnel and or signage.
- Two emplacements cells will be utilized daily – one for offloading and collection of recyclables while the second cell is being maintained for proper placement, thickness compaction and coverage.
- Waste should be disposed off and covered in thin bands up to 3.0m which should be build up into a layer about 2m deep. This reduces the likelihood of instability and settlement problems in the future.
- Compacted waste should be covered with excavated soil or similar inert material (alternatives such as construction and demolition material and ash) to deter flies and other insects from breeding in waste; to reduce the

attraction of birds to wastes; to suppress odors and dust as well as reducing wind-blown waste.

- Inspecting for proper placement, thickness, slope, settlement, erosion and compaction. Emplacement cell's maintenance will be ongoing throughout post closure care period.
- Deliberate and controlled co-disposal of a range of industrial/hazardous waste and municipal/household waste is recommended where the State Hospital incineration cannot be utilized.

3.2.5. Reuse and Recycling

Waste burning should not be permitted. Fires can cause hollows in the waste, encouraging instability, and could ignite pockets of landfill gas, causing explosions. If not quickly extinguished, fires can become deep seated and smolder for many years. It is thus recommended to reuse or recycle waste instead of burning.

Special waste: such as ***tyres*** should be recycled as retreads, for use on carts, to make shoes, flower pots, gardening, road demarcation, playground equipment, animal feeding troughs and for a number of other domestic, farming, agricultural and industrial articles. ***Construction and Demolition Debris (CDD)*** should be reused as covering material during waste emplacement, and for the filling of low-lying areas subject to regular flooding. ***Wood, nails, bricks, and other materials of direct use*** should also be reclaimed from CDD for use in a number of minor DIY construction projects. The rate of recycling of CDD, especially bricks and wood (for the manufacturing of furniture and as firewood), has already been established country-wide. Similarly, to the marketable recyclables, unemployed community members should be organized into tyres and CDD specialized groups with a permit to operate at the disposal site as job creation ventures.

Used oil and grease should be recycled as an industrial lubricant or fuel through the establishment of a deposit system to increase the rate of oil recycling. It is suggested to identify companies, within the Kavango Region (Wesco Group, a factory for the regeneration of used oil operating in Walvis Bay too) that are collecting used oil for

refining and reuse purposes. Again the establishment of agreements with such companies will promote the recycling of used oil across and within the entire Nkurenkuru district. Worthwhile for consideration is to provide waste reclaimers with rag-pulling equipment to shred, clean, and reknit ***fabrics and textiles*** as all-purpose utility cloths for resale. This is equally applicable to ***repairable waste items*** such as electrical equipment, utensils, bicycles, radios and many other items at designated recycling centers/stations.

Composting: Urban demand for compost has not been established. Additionally, the technology works better with a well-segregated MSW stream, which may be the case with garden refuse in Nkurenkuru.

Incineration: The construction of an incinerator by Council should remain a non-option for the short to medium term taking into consideration the availability of the State Hospital incinerators, which Council should be able to utilize once the need arises. In addition, high costs relative to other municipal solid waste management options, a limited infrastructure, human, mechanical and institutional resources, and the composition of the waste stream itself, suggest that incineration is an inappropriate technology for Council for the short to medium term future.

3.2.6. Continuous Site Rehabilitation

Weekly cover application is essential and required in every disposal site operation. The weekly cover application will minimize negative effects of the site operation such as odours nuisance, wind-blown waste and vector populations. It might also avoid landfill fires, minimize contamination of surface runoff, and improve aesthetics of the site operation. The availability of soil or other inert matter material as cover material is of importance for the weekly coverage of the waste. Instead of transporting soil or other inert material to the disposal site over longer distances (which is expensive), unutilized compost or demolition waste should be used as alternative daily cover material. This can be considered as "*best available practice*" to operate the site, especially when insufficient soil cover material or lack of financial resources is experienced.

Final cover application: The council is recommended that after a single emplacement cell has reached its final capacity the waste needs to be covered first by an intermediate cover layer, which is sensitive to settlements of the disposal site surface. The functions of this intermediate cover layer (e.g. 50 cm of soil or compost) are the prevention of erosion by wind and water; the reduction of water infiltration, and gas emissions to promote vegetation, and for aesthetic issues.

Post-closure care: The site needs to be managed and controlled in order to avoid adverse effects on humans and the environment after the closure of this disposal site. This post-closure care (or site aftercare) has to be prolonged as long as landfill emissions represent a hazard to human health and the environment, which post-closure care is estimated to be in the range of several decades to centuries. In addition, the status of different elements should also be observed, such as final cover integrity, natural drainage system - monitoring boreholes, vegetation growth, slope, etc.

3.2.7. Draft EMP Database System and Review Process

The database system is a critical component of this Draft EMP, as the management plan refers to any operational records and reports, design information and monitoring reports, which are the site records for the disposal site. The site records should be referenced on a regular basis. The format of the database system should facilitate ease of reference to the site records and incorporate a process for identifying documents, and should include the provision for document identification numbers and provision for issue dates and authors as a minimum. Daily recording sheets and monthly site inspection reporting and reports will be included in the database system to identify the process to be used in reviewing the Draft EMP. The system should be used to clearly demonstrate that the site development stage, identified actions required and outcomes are met or not met.

The review period for the Draft EMP for this disposal site shall be each year or as otherwise specified in the Environmental Clearance Certificate (ECC). Given the

ongoing records keeping, monitoring and reporting associated with the disposal site, the review of the Draft EMP should demonstrate that the sufficiency of the operational, layout design and daily monitoring and reporting systems for the current development stage of the site has been addressed. The review process should be established to ensure continual improvement in the management and operation of the disposal site.

The Draft EMP review process (for example, a checklist system) will assist in identifying the outcomes from site investigations, operational reporting and/or monitoring programs and so on, for incorporation in upcoming management plan as appropriate. As a result, the outcome of the Draft EMP review process is that only specific sections of the management plan (here mainly Chapter 3 of this Plan) may be subject to revision and submission to the Environmental Commissioner for approval in terms of ***Part VI of the Environmental Management Act***, No 7 of 2007.

4. CONCLUSION

The Nkurenkuru Town Council should *take the overall responsibility* to ensure that all recommended actions within this Draft EMP are properly implemented, monitored, evaluated, recorded and accordingly reported. All key role players such as the Council staff involved in the day to day operations of the waste disposal site; all waste contractors and service providers, and recyclers on site should be informed about the content of this Draft EMP and activities to be undertaken.

The council should ensure *compliance to Section 5 and Part VI of the EMA* that deals with Waste and Environmental Plans respectively. Apart from legal compliance, *adherence to this Draft EMP* will result in a well-managed designated disposal site, which in turn will minimize operational costs and future potential negative impacts and threats to the environment and public.

5. REFERENCES

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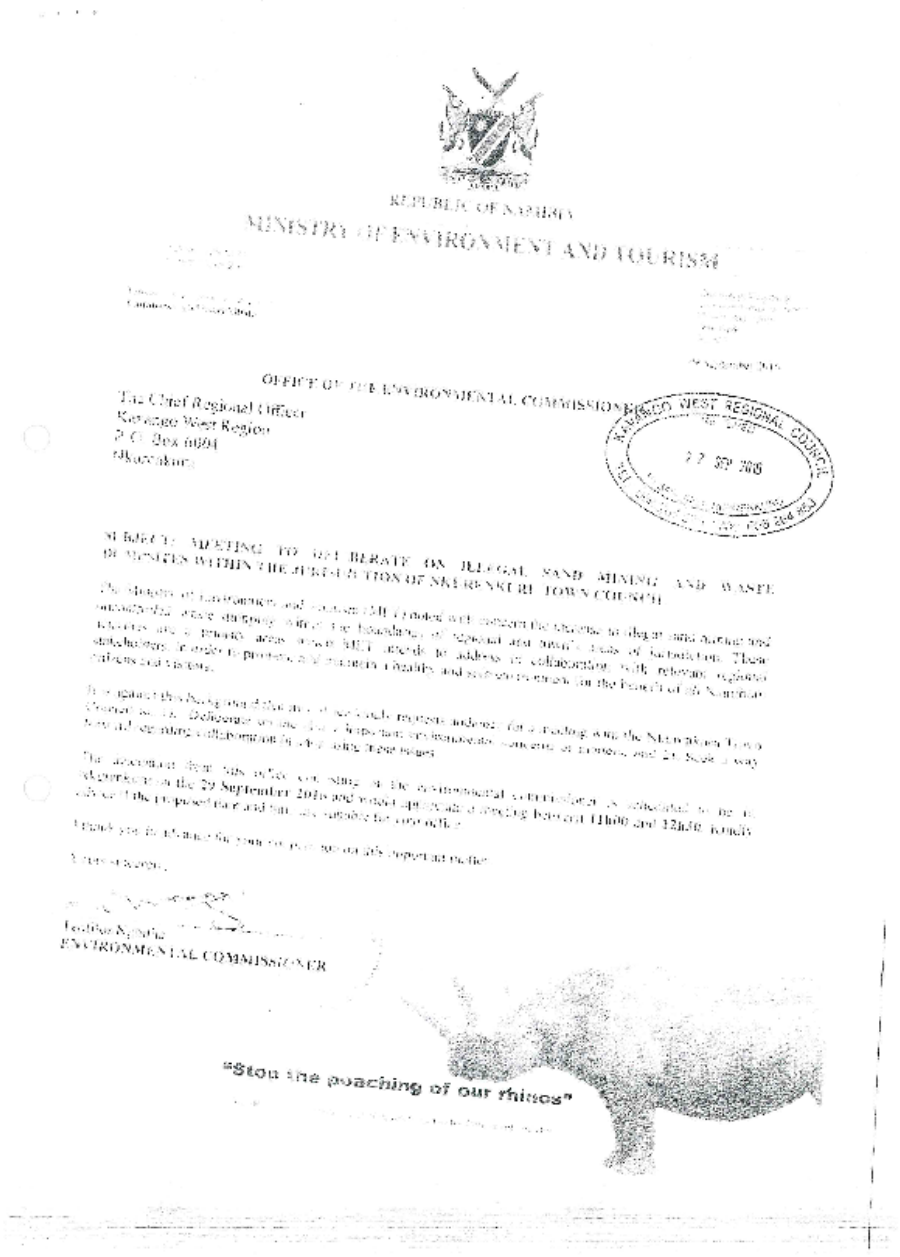

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

The Chief Regional Officer
Kunene West Region
P O Box 6004
Khorixas

KUNENO WEST REGIONAL COUNCIL
22 SEP 2016

SUBJECT: MEETING TO DELIBERATE ON ILLEGAL SAND MINING AND WASTE DISPOSITIONS WITHIN THE JURISDICTION OF SWAKOPMUND TOWN COUNCIL

"Stop the poaching of our rhinos"

Appendix 1: Ministerial Correspondence Re-Waste Management Concerns

Appendix 2:**A Typical Daily Waste Composition Recording Sheet**

WASTE COMPOSITION	DATE	LOAD 1	LOAD 2	LOAD 3	LOAD 4	LOAD 5	TOTAL
GENERAL HOUSEHOLD WASTE in m^3							
GLASS BOTTLES in m^3							
PLASTIC BOTTLES in m^3							
PLASTICS in m^3							
WHITEPAPER in m^3							
NEWS PAPER in m^3							
BOXES/CARTONS in m^3							
CANS in m^3							
STEEL/METALS in m^3							
GARDEN/PUTRESCIBLE in m^3							
TYRES in numbers or m^3							
OILS/SLUDGES in m^3							
BUILDING RUBBLE in m^3							
INDUSTRIAL/HAZARDOUS in m^3							
OTHER WASTE in m^3							

Computation:
* Estimated Load in m^3
* Depending on the open pick-up truck load-box capacity: L X B X H = m^3

In RED – Not compulsory- ONLY IF IN SIGNIFICANT QUANTITIES

Electronic version of this recording and inspection sheets will be made available to the Gobabis Municipality for appropriate amendments and usage purposes accordingly.

Appendix 3: A Typical Site Inspection Report Structure for Ensuring Best Practice

SITE INSPECTION REPORT

Site Name ……

Ref No …….

Date of Inspection …… Time in ……..

Inspector's Name …….

Reason for Inspection …… Time out ……

Weather ……

Site: Open/Closed

Status at Time of Inspection	Satisfactory = S Partial Satisfactory = PS Unsatisfactory = US		S	PS	US	Not Checked Inapplicable	Comments
Environ. Man. Plan Compliance							
Types of Waste							
Layering/Compaction of Waste							
Covering of Waste							
Litter Screens & Litter Control							
Liner/Protective Layer							
Condition of Site Roads							
Condition of Site Entrance							
Access Road Cleaning							
Site Tidiness							
Fires and smoke							
Insects/Vermin/Birds							
Surface Water							
Leachate (on-site)							
Landfill Gas							
Odours							
Noise							
Dust							
Gate/Fencing/Security							
Office/Site Notice Board							
Manning & Supervision							
Site Record Keeping							
Cover Stockpile							
Site Environs	Litter						
	Leachate						
Other Observations/Actions Required:							
IMMEDIATE ACTION IS REQUIRED ON:							
Site Operator's Comments:							

Samples Taken: Yes/No Photographs Taken: Yes/No	Inspector's Signature:	Received by& When: