

**DRAFT ENVIRONMENTAL IMPACT REPORT
IN SUPPORT OF A
WASTE MANAGEMENT LICENSE APPLICATION FOR THE PROPOSED
HAZARDOUS WASTE (E-WASTE) RECYCLING, RECOVERY AND
TREATMENT FACILITY AT
CF AFRICA TRADING (PTY) LTD, T/A REVIVE AFRICA
GAUTENG PROVINCE**



Report Nr: 4342-ZANREV-2026

Report Date: 17 August 2026

General Information	
Report Name:	Draft Environmental Impact Report in Support of a Waste Management License for the Proposed Hazardous Waste (E-Waste) Recycling, Recovery and Treatment Facility at CF Africa t/a Revive Africa Located in New Centre, Johannesburg, Gauteng Province
Report Date:	17 August 2026
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Report Nr:	4342-ZANREV-2026
WML Application Ref Nr:	12/9/11/L260623131323/3/N

TERMS AND ACRONYMS

NEMA	National Environmental Management Act (No. 107 of 1998)
NEM: AQA	National Environmental Management: Air Quality Act (No. 39 of 2004)
NEM: WA	National Environmental Management Waste Act (No. 59 of 2008)
NWA	National Water Act (No.36 of 1998)
EMPr	Environmental Management Program
GNR	Government Notice Regulation
GA	General Authorisation
GWIS	Gauteng Waste Information System
BA	Basic Assessment
EIA	Environmental Impact Assessment
EIR	Environmental Impact Assessment Report
EA	Environmental Authorisation
IAP's	Interested and affected Party
RoD	Record of Decision
WML	Waste Management License
WUL	Water Use License
GDARD	Gauteng Department of Agriculture and Rural Development
DEFF	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
ECO	Environmental Control Officer
WMCO	Waste Management Control Officer
°C	Degrees Celsius
cm	Centimetres
I&AP	Interested and Affected Parties
kg	Kilograms
m	Metres
m ²	Square metres
m ³	Cubic metres
mm	Millimetres
PPE	Personal Protective Equipment
GWIS	Gauteng Waste Information System
SAWIC	South African Waste Information System
ECA	Environment Conservation Act, 1989
APPA	Atmospheric Pollution Prevention Act
SANS	South African National Standards
SAWIS	South African Waste Information System

DEFINITIONS

Disposal	Means the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.
General waste	Means waste that does not pose an immediate hazard or threat to health or to the environment, and includes- a) domestic waste; b) building and demolition waste; c) business waste; d) inert waste; or e) any waste classified as non-hazardous waste in terms of the regulations made under section 69, and includes non-hazardous substances, materials or objects within business, domestic, inert, building and demolition wastes.
Hazardous waste	Means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles.
Recycling	Means a process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material
Reuse	Means the action or practice of using something again, whether for its original purpose (conventional reuse) or to fulfil a different function (creative reuse or repurposing)
Recovery	Means the controlled extraction or retrieval of any substance, material or object from waste
Storage	The accumulation of waste in a manner that does not constitute treatment or disposal of that waste.
Treatment	Means the biological, chemical, or mechanical method(s) employed to remove pollutants from industrial or municipal wastes, change the character and composition of medical waste, or reduce or eliminate its potential for harm to living beings and the environment.
Construction	The building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint;
Waste	a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste- i. once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered; ii. where approval is not required, once a waste is, or has been re-used, recycled or recovered; iii. where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or iv. where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste.

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1. INTRODUCTION AND PROJECT BACKGROUND

1.1. Process Description

CF Africa Trading Pty (Ltd), trading as Revive Africa, currently operates a small-scale e-waste trading, storage and dismantling facility located at 24-26 Laub Street, New Centre Johannesburg. The company began operations in 2014 as a trader of empty printer cartridges that are collected through a corporate collections program. Revive Africa stores and prepare the cartridges prior to exporting them to upstream vendors for recycling. Since its inception, Revive Africa has expanded its operations into broader e-waste recycling. Since 2020, the company has collected over 434 593 laser cartridges and 982 404 ink units, keeping them out of landfill.

In April 2022, Revive Africa began trading printed circuit boards (PCBs) and collected a total of 96 306 kilograms to date. These PCBs are part of e-waste materials such as cell phones, computers, copiers, laptops, printers, servers, and telecommunications equipment. This initiative also led to the establishment of dedicated dismantling stations for the manual decontamination of the PCBs. Manual decontamination of e-waste also known as manual dismantling or depollution, involves the careful, non-destructive disassembly of electronic equipment by hand using tools such as screw drivers, hammers etc. to remove hazardous substances and separate materials for recycling. This process is crucial to isolate toxic components (like mercury, lead, and cadmium) from high-value materials (gold, copper, plastics), enhancing safety and recovery rates.

The facility soon realized that many of the devices they dismantle contained lithium-ion batteries (LIBs) and began a pilot project for discharging and recycling LIBs into black mass that is traded to upstream vendors for further metal extraction. The e-waste, consisting mainly of printer cartridges, printed circuit boards (PCBs) and Lithium-Ion batteries are collected through a corporate collections program before being transported to the Revive Africa facility. Majority of the material received is only subjected to re-packaging before being traded to upstream vendors for further processing.

With the proven success of the trials, Revive Africa now plans to establish a full-scale e-waste recycling facility comprising a PCB Recycling Plant and a Lithium-Ion Battery Recycling Plant. This project aims to process materials locally, create employment, and contribute to sustainable resource recovery in South Africa. The proposed facility entails increasing the volumes of e-waste accepted, as well as expanding their footprint to the adjacent buildings in 28-32 Laub Street, New Centre Johannesburg. The proposed services for the e-waste management processes include recycling, treatment and recovery of e-waste and LIBs.

- a) The planned PCB recycling facility will cover 1 800 m², dedicated to e-waste storage, dismantling, and processing. The plant will be capable of processing 40-50 tons of PCBs per month and is expected to create at least 15 new jobs, depending on volume. PCBs will be collected, graded, shredded and sold to upstream vendors for further processes.
- b) The battery recycling facility will occupy approximately 900 m², for battery storage, discharging, shredding, and screening. It will have the capacity to process up to four (4) tons of lithium-ion batteries per day. The process will entail discharging batteries, shredding them into granulate, and screening the granulate to separate the black mass from plastic and copper residues. Comprehensive environmental and safety controls will be implemented to manage VOCs, fluorinated gases, and particulate emissions to ensure safe operations.

In addition to the recycling, recovery and treatment activities Revive Africa will utilise the space available within the facility for storage as well as the continuation of the printer cartridges trade. The facility is registered in terms of the Norms and Standards for the Storage of Hazardous Waste (Reg Nr: 12/9/11/ST574/3) (**Annexure L**).

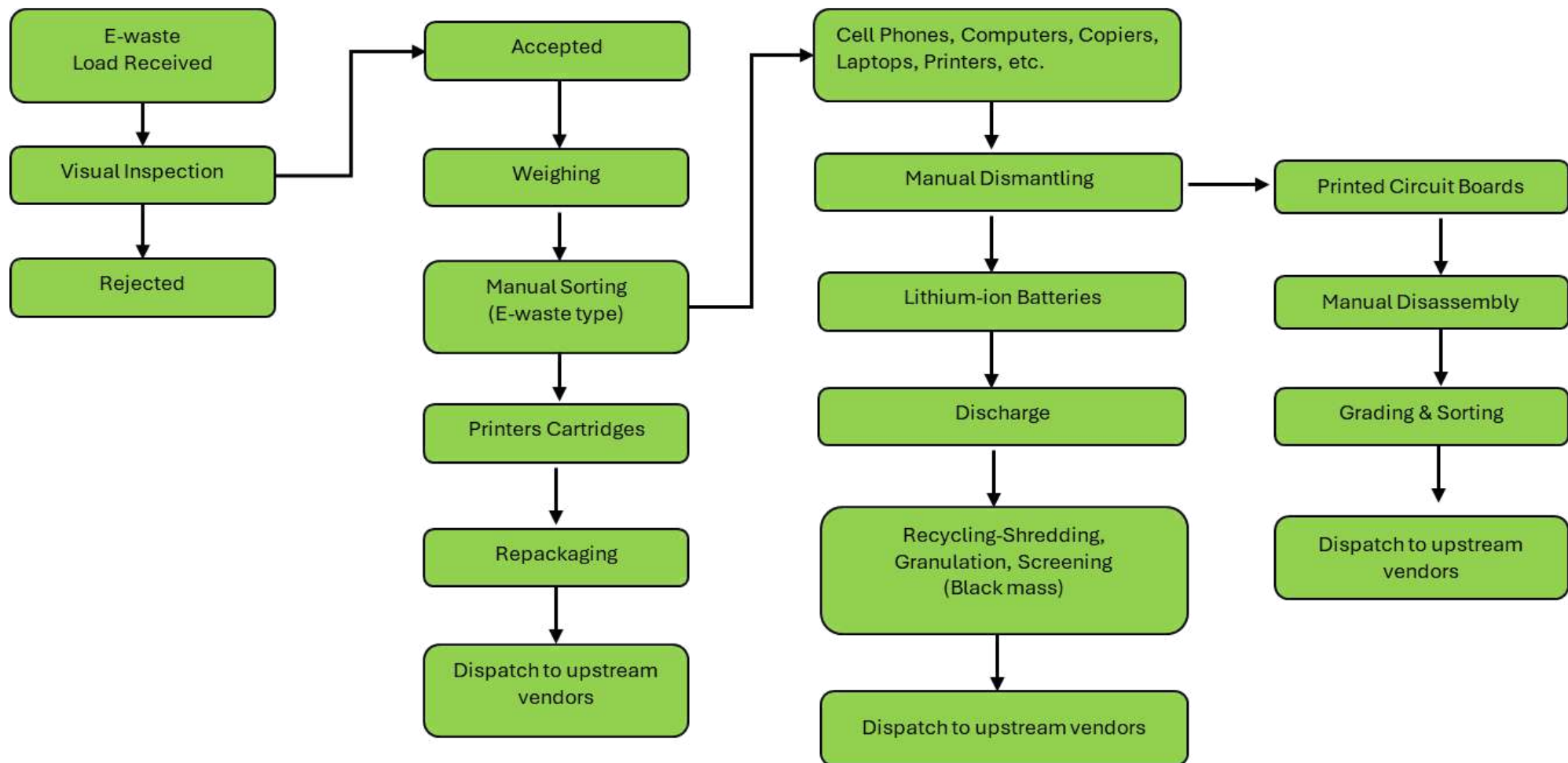


Figure 1: Revive Africa Current Process Flow

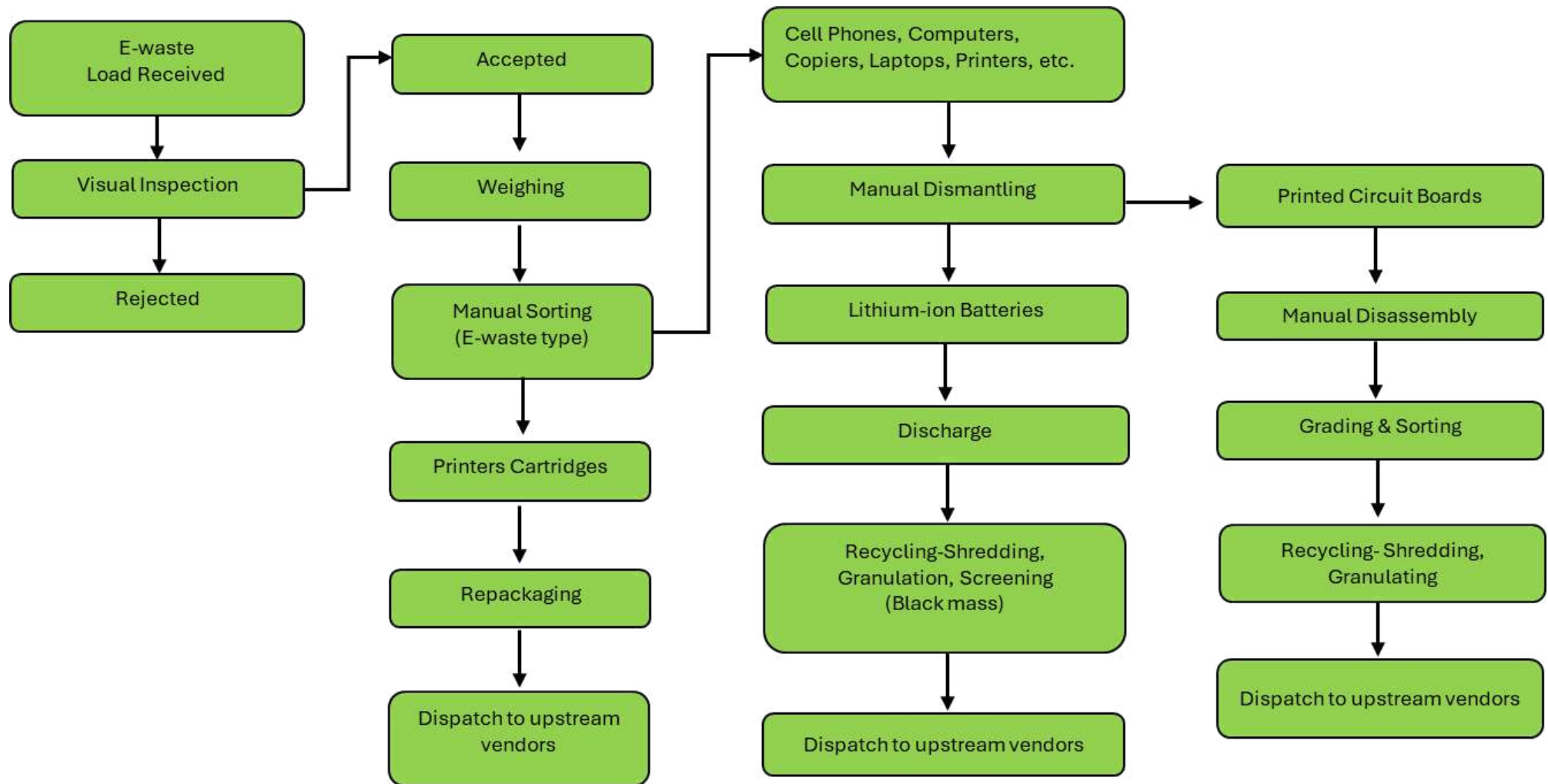


Figure 2: Revive Africa Proposed Process Flow

1.2. Legal Requirements

In terms of the National Environmental Management: Waste Act (No. 59 of 2008) (NEM: WA), waste management activities that are listed in regulations published under NEM: WA may not be undertaken without a Waste Management License (WML). The listed activities for which a WML is required are contained in Government Notice (GN) 921. Category A activities require a WML, and a Basic Impact Assessment (BA) process must be conducted, and Category B activities require a WML, and a full Scoping and Environmental Impact Assessment (EIA) process must be conducted.

The proposed waste management activities at Revive Africa will therefore trigger the following activities published under Category B of GN 921:

GNR 921 - Listed activity	Description of listed activity
B (2)	<i>The reuse or recycling of hazardous waste in excess of 1 ton per day, excluding reuse or recycling that takes place as an integral part of an internal manufacturing process within the same premises.</i>
B (3)	<i>The recovery of waste including the refining, utilisation, or co-processing of the waste at a facility that processes in excess of 100 tons of general waste per day or in excess of 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises.</i>
B (4)	<i>The treatment of hazardous waste using any form of treatment at a facility that processes in excess of 1 ton per day calculated as a monthly average, excluding the treatment of effluent, wastewater, sewage or organic waste using composting or any other organic waste treatment.</i>
B (10)	<i>The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).</i>

Revive Africa is therefore applying for a WML in terms of NEMWA, for which a Full Scoping EIA process will be followed. The waste streams that are processed at the facility have been classified as hazardous waste. The Competent Authority (CA) for the WML application has therefore been identified as the Department of Forestry, Fisheries and the Environment (DFFE).

1.3. Purpose of this Document

The Full Scoping and EIA process must be followed as part of the application for the required WML which will be facilitated by the Department of Forestry, Fisheries and the Environment (DFFE).

The waste-related activities proposed by Revive Africa require a Waste Management License (WML). This Environmental Impact Report, representing the second phase of the required Environmental Impact Assessment (EIA), has been prepared to support the WML application.

An application form was therefore submitted to the DFFE and application reference number 12/9/11/L260413152509/3/N/ issued.

In support of the application, a Scoping Report was submitted and approved by the Department on the 07th of August 2026, authorising the next phase of the application process (**Annexure M**).

This Environmental Impact Report (EIR) was therefore drafted in line with the requirements as set out under Appendix 3 of the EIA Regulations. The aim of the EIR is to identify issues and concerns raised by Interested and Affected Parties (I&AP's) as well as identifying impacts associated with the proposed operations. Finally, the EIR must include an Environmental Management Program which must address the identified issues and or impacts and provide appropriate mitigation measures in order to reduce the risk of the identified impacts.

A copy of the Draft EIR will be made available for public review and comment, during which all I&APs as well as relevant Departments and the Competent Authority will be given the opportunity to comment on the Draft EIR.

2. APPLICANT AND PRACTITIONER DETAILS

2.1. Details of the Applicant

Applicant	CF Africa Trading Pty Ltd
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Business registration nr	2013 236150/07
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Postal address	24 Laub Street New Centre Johannesburg 2001
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2.2. Details of the Environmental Assessment Practitioner

Independent consultant	Zantow Environment Consulting Services CC
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Postal address	PO Box 3858, Vanderbijlpark, 1910
Physical address	Corner of Delius and Chopin Streets Coliseum Building 1 st Floor, Unit 2 Vanderbijlpark, 1910

2.3. Declaration of Environmental Assessment Practitioner independence

Zantow Environmental is not in any manner affiliated to the applicant, CF Africa Trading (Pty) Ltd, t/a Revive Africa. Zantow Environmental also does not have any interest in secondary developments that may arise out of the authorisation of the proposed activities. Furthermore, the Zantow Environmental (appointed EAP) meets the requirements for independence as none of the project team members has and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the EIA Regulations, 2014; has and will not have vested interest in the proposed project proceeding; and also, has no and will not engage in conflicting interests in the undertaking of the activity.

2.4. Expertise of the Environmental Assessment Practitioner

Refer to **Annexure A** for a copy of the EAP's curriculum vitae and EAPASA Registration.

- **Karien Zantow**

Karien Zantow obtained her degree from the University of Pretoria in BSc (Agric) Animal Science. The main subjects were Physiology, Nutrition, Ecology, Biochemistry, Toxicology, Plant production, Soil Science and Pasture Science. This degree provided her with a sound base and understanding of the environment.

Karien extended her knowledge in the environmental sciences by completing the BSc (Hons) Environmental Technology at the University of Pretoria. The honours degree presented by the Chemical engineering department addressed Environmental management that included South African environmental legislation, ISO 14001, Environmental impact assessments, Life cycle assessment, auditing and public participation. As well as the three specialized fields of study: Water (wastewater treatment and design), air (abatement equipment) and solid/hazardous waste management. She also completed a Post Graduate diploma in Environmental Sciences at the University of Witwatersrand which focussed on Environmental Law, Environmental Chemistry, Air quality and Energy, Waste and Wastewater management and Environmental Impact Assessments.

Karien Zantow has more than 15 years of environmental experience in the construction, mining and industrial sectors working within the legislative environment.

- Teaching Business, subcontracted to Barlow World (1 year)
- Sappi Kraft Ngodwana (2 years) – As environmental engineer
- ArcelorMittal South Africa Germiston Works (7 years)
- Zantow Environmental Consulting Services (2012 – current)

During her career she has been involved with many large-scale site characterisation and remediation projects from the conceptual phase to implementation. Other projects include a variety of Waste Management Licenses, Atmospheric Emissions Licenses, other EIA's and Environmental Audits. Moreover, emission sampling and reporting forms a core component of Karien's scope of work.

Karien is also a registered Natural Science Professional with the South African Council for Natural Scientific Professions (Reg Nr 400114/14).

3. LOCATION OF THE PROPOSED WASTE MANAGEMENT ACTIVITIES

This section contains details of the property on which the proposed waste management activities will be undertaken as well as a description of the project and scope.

3.1. Location of the proposed facility and Property details

The site is located at 24 Laub Street, New Centre, which is in the jurisdiction of the City of Johannesburg Metropolitan Municipality in the Gauteng Province (See Figures 3, 4 and 5). The proposed waste management activities will be undertaken in an industrial zoned area and is considered to be completely transformed by the existing industrial activities.

Property Description:

- Erf 137 in New Centre, Johannesburg
- Erf 45, 47, 49 in New Centre, Johannesburg

Physical address: 24 Laub Street, New Centre, Johannesburg

Table 1: Coordinates of the site for the proposed facility

Corner	Latitude	Longitude
A	26° 12' 57.69" S	28° 02' 47.75" E
B	26° 12' 58.83" S	28° 02' 47.68" E
C	26° 12' 58.94" S	28° 02' 49.39" E
D	26° 12' 58.98" S	28° 02' 49.39" E
E	26° 12' 59.02" S	28° 02' 50.23" E
F	26° 12' 59.03" S	28° 02' 50.24" E
G	26° 12' 59.09" S	28° 02' 51.07" E
H	26° 12' 58.39" S	28° 02' 51.10" E
I	26° 12' 57.88" S	28° 02' 51.14" E
J	26° 12' 57.78" S	28° 02' 49.46" E
K	26° 12' 58.15" S	28° 02' 49.45" E
L	26° 12' 58.09" S	28° 02' 48.58" E
M	26° 12' 57.73" S	28° 02' 48.60" E

Refer to Figure 3 for the corner references.

3.2. Surveyor general codes

PROPOSAL	T	O	I	R	0	4	6	0	0	0	0	0	0	1	3	7	0	0	0	0	0
	T	O	I	R	0	4	0	0	0	0	0	0	0	0	4	5	0	0	0	0	0
	T	O	I	R	0	4	6	0	0	0	0	0	0	0	4	7	0	0	0	0	0
	T	O	I	R	0	4	6	0	0	0	0	0	0	0	4	9	0	0	0	0	0

3.3. Zoning of the property

The site is zoned as Industrial, and has been utilised for such purposes, therefore the proposed waste management activities are in line with the zoning of the property.

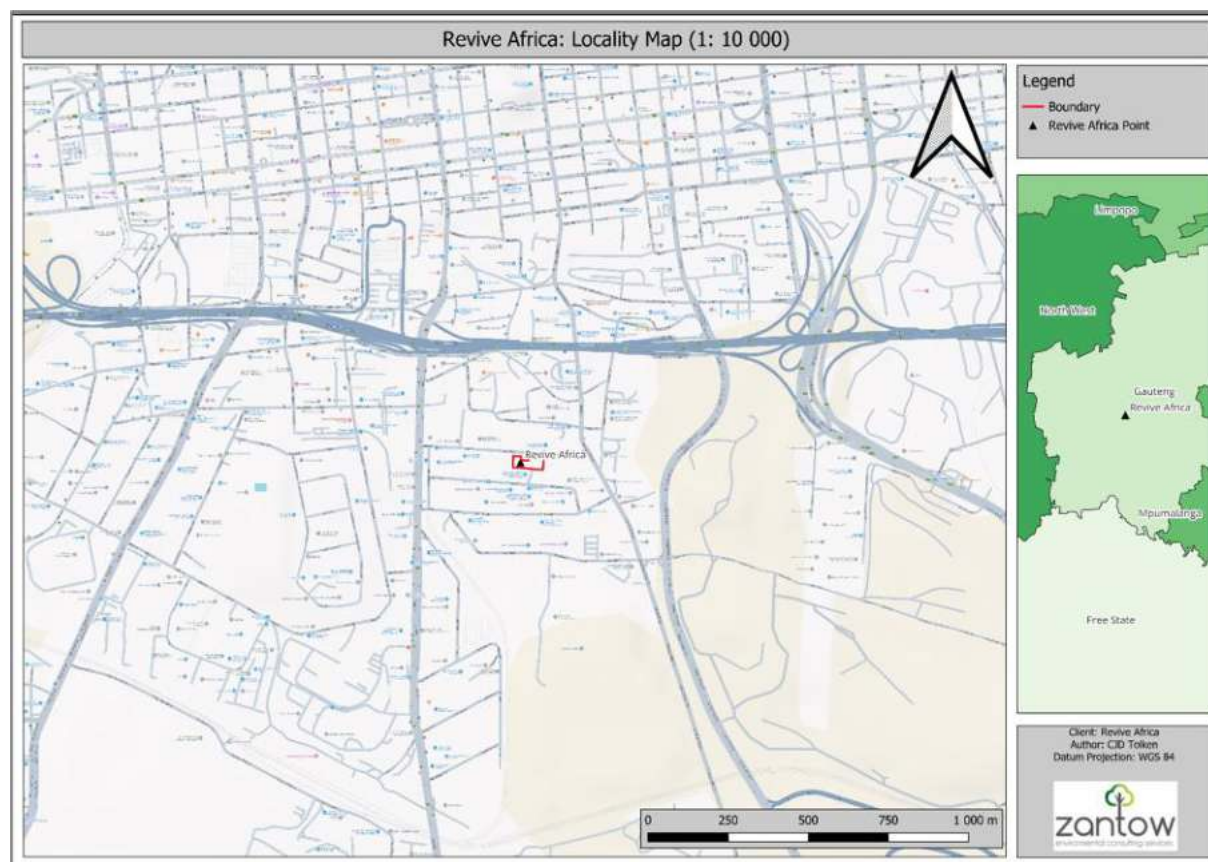


Figure 3: Revive Locality Map

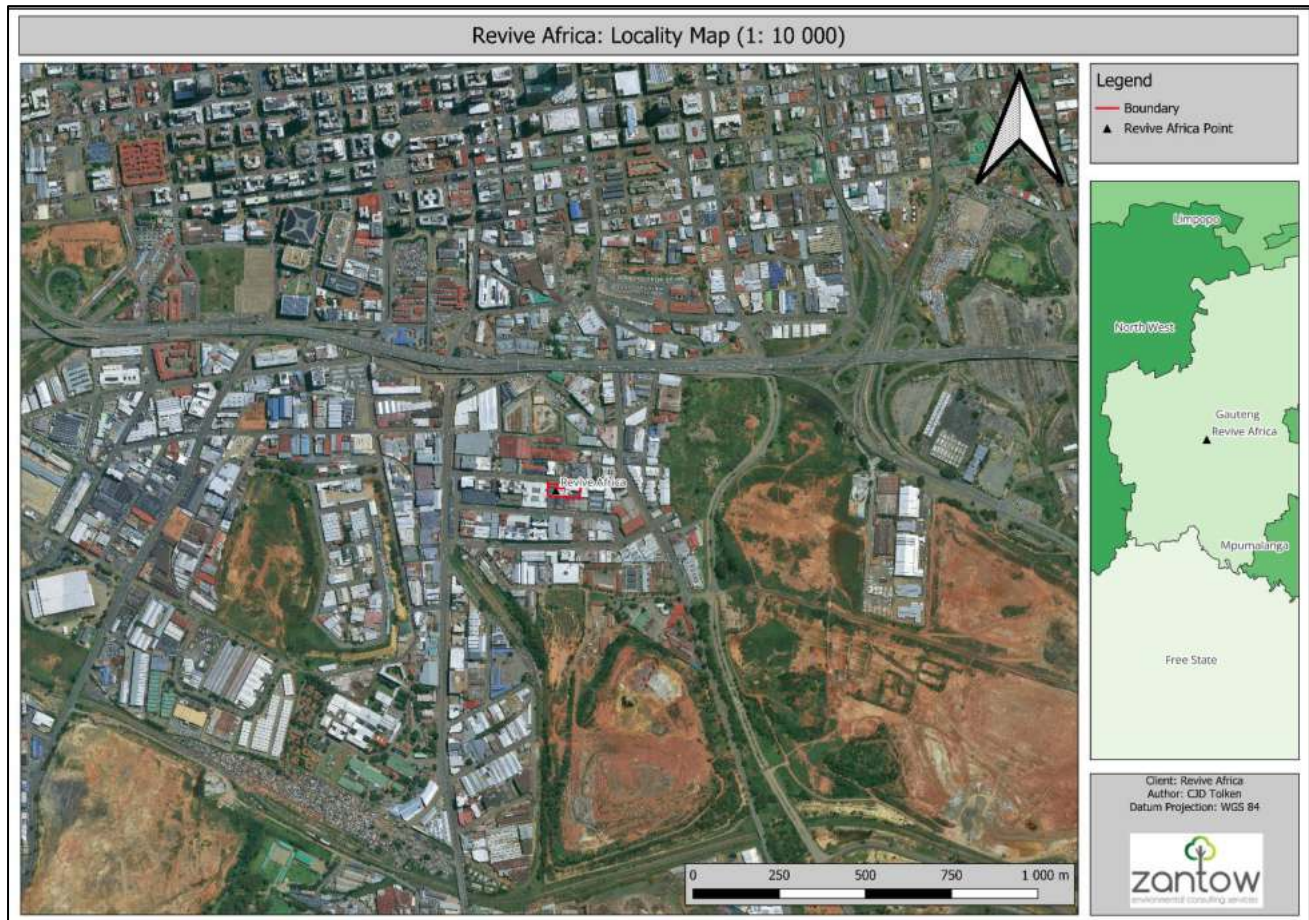


Figure 4: Aerial Map

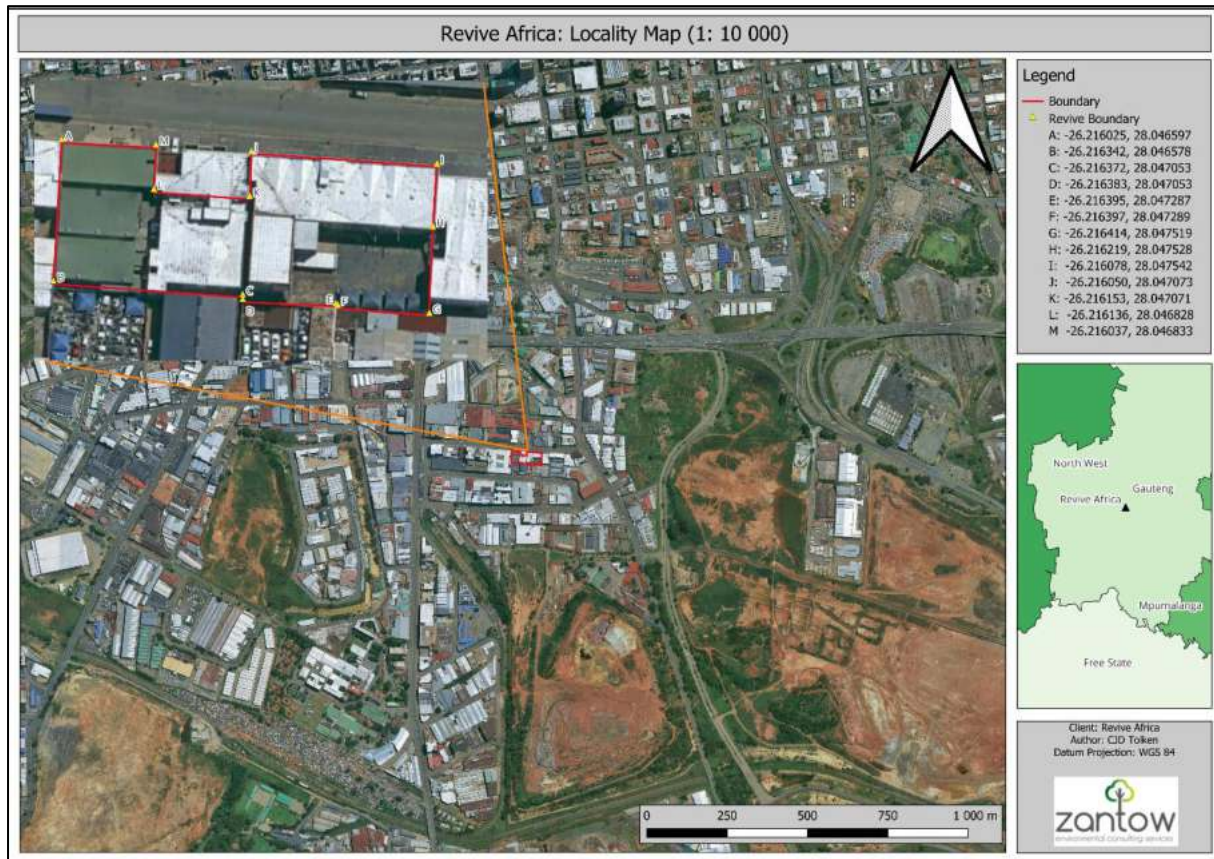


Figure 5: Boundary Co-ordinates

4. Supporting Infrastructure Associated with the Facility.

4.1. Site Description and Surrounding Infrastructure

4.1.1. Roads

The proposed site is located in New Centre, an established commercial and industrial area within the Johannesburg Metropolitan Municipality, in Gauteng Province. The area benefits from well-developed road infrastructure, allowing convenient access to and from the site.

The site is situated on Laub Street, which connects to the M9 (Eloff Street). This route provides direct linkage to the M2 (François Oberholzer Freeway), a major east–west arterial highway within Johannesburg. The M2 runs along the southern edge of the Johannesburg Central Business District (CBD), originating near the R41 and extending eastward, where it connects with the N3 highway near Germiston. The M2 and M9 metro roads are within a 1km radius to the site, providing easy access to the proposed area.

Refer to Figures 3 and 5 under Section 3 for maps depicting the site's locations and associated access roads.

4.1.2. Security and Access Control

The proposed site for the waste management activities is fenced and equipped with a gate for controlled access and to restrict unauthorised entry. The entrance to the existing operations is manned by security personnel and no one can access the site without prior arrangement with management. The current process flow depicted in Figure 4 where waste material that is received on site is inspected to determine whether it is acceptable material for the site, if the material contained is not acceptable it is rejected and sent back to the supplier. If accepted the material is directed to internal documentation and processing.

4.1.3. Electricity and Energy Supply

The site is connected to the municipal electricity grid, which will remain the primary source of electricity for the proposed waste management activities. The existing municipal electricity supply has sufficient capacity to accommodate the proposed activities, and no upgrades to the existing municipal electricity infrastructure are anticipated. Although the proposed machinery and equipment will result in an increase in electricity consumption, the additional demand is not expected to be significant enough to place strain on the existing municipal infrastructure or necessitate upgrades.

The proposed waste management activities will therefore require additional electricity, resulting in an increase in the facility's overall electricity consumption. While the anticipated increase has not been specifically quantified, the facility will implement energy-efficient equipment and operational practices to promote the responsible use of electricity and minimise unnecessary consumption.

4.1.4. Water Supply

The site is connected to the existing municipal water infrastructure within the City of Johannesburg, which will provide for the facility's water requirements. The proposed waste management activities are not expected to require significant quantities of water. The primary water uses will be for domestic and sanitation purposes within the administrative offices, as well as for the controlled discharge of spent lithium-ion batteries (LIBs) using a sodium chloride solution.

As part of the LIB pre-treatment process, spent batteries will be immersed in a sodium chloride solution to discharge residual electrical energy and render the batteries safe for subsequent recycling activities. The discharge solution is anticipated to comprise approximately 10-20% sodium chloride by weight, with the remaining 80-90% comprising water. For preliminary planning purposes, a battery-to-solution ratio of approximately 1:2 to 1:5 by weight is assumed, meaning that the processing of 1 tonne of LIBs would require approximately 2 000-5 000 litres of saline solution to ensure adequate immersion.

Based on the proposed processing capacity of approximately 4 tonnes of LIBs per day, the process will require a gross working volume of approximately 8 000-20 000 litres (8-20 m³) of sodium chloride discharge solution for processing the daily throughput. This volume represents the working solution required within the process and does not represent the quantity of fresh municipal water that will be consumed each day.

The discharge solution will be retained within a closed-loop, contained system and will be recovered and recirculated for subsequent battery-discharge batches where practicable. Therefore, the same solution will be used repeatedly to process multiple batches of LIBs and will not be replaced with an equivalent volume of fresh water each day. Consequently, the monthly fresh-water requirement associated with the LIB discharge process is expected to be substantially lower than the gross working-solution volume calculated from the monthly processing capacity.

For example, although processing 4 tonnes of LIBs per day equates to approximately 8-20 m³ of gross working solution, this does not mean that 8-20 m³ of fresh water will be consumed daily, nor that 240-600 m³ of fresh water will be consumed monthly. The 240-600 m³/month figure represents the cumulative gross solution volume corresponding to the processing throughput and is provided for process-design purposes only. The actual fresh-water requirement will primarily comprise the initial filling of the system, make-up water required to compensate for unavoidable operational losses and evaporation, and periodic replacement of solution when it is no longer suitable for reuse.

To minimise fresh-water consumption, operational costs and potential environmental impacts, the facility will implement a closed-loop recovery and recirculation system for the sodium chloride discharge solution. The solution will be retained within a suitably designed and contained system and, where practicable, recovered and reused for subsequent battery-discharge batches. Appropriate monitoring and management of the solution will be undertaken to maintain the required operating conditions and to determine when treatment, replenishment or replacement is necessary.

Fresh municipal water will therefore primarily be required for:

- the initial preparation of the sodium chloride discharge solution;
- make-up water required to compensate for operational losses and evaporation;
- periodic replacement or replenishment of the discharge solution where the solution can no longer be effectively reused; and
- domestic and sanitation purposes within the administrative and associated facility areas.

The actual fresh municipal water requirement for the LIB pre-treatment process is expected to be considerably lower than the gross working-solution volume, due to the planned recovery and reuse of the discharge solution. The final fresh-water consumption will depend on the efficiency of the recovery and recirculation system, evaporation rates, operational losses, solution quality requirements and the frequency of solution replacement. A definitive fresh-water consumption rate will be confirmed during detailed process design and once the final operating parameters have been established.

The spent sodium chloride discharge solution will be managed within a contained process system and, where practicable, recirculated and reused. Where the solution requires replacement and is no longer suitable for further use, it will be removed from the process and stored in suitable, secure and appropriately labelled containers or tanks pending collection by an appropriately authorised waste management service provider. The spent solution will be sampled and characterised, where required, to determine the appropriate treatment and disposal route. Where necessary, the spent solution will be transported to an appropriately authorised off-site treatment facility for treatment and/or disposal. No untreated spent discharge solution will be discharged to the municipal sewer, stormwater system or surrounding environment.

4.1.5. Waste Management

The proposed site is a waste management facility that will be recycling, treating and recovering valuable materials contained in e-waste and consequently diverting them from unsustainable disposal practices. Therefore, waste generated from the site is expected to be minimal and consisting mainly of general domestic waste from the day-to-day administrative operations.

A waste management plan (WMP) will be developed for the facility to ensure that most of the waste is diverted from landfill and that any hazardous waste arising from the operations that cannot be handled internally is managed in a sustainable manner. The WMP will be included in the EIR phase of the application and will be updated once the facility has commenced with the activities. The table below gives a summary of the waste expected to be generated:

Waste	Activity	On Site Waste Handling	Final Destination
General Waste: Paper, Domestic Waste	Administrative, Domestic waste	Waste is separated into recyclable vs non-recyclable waste and stored in designated waste containers prior removal from site.	- Recyclable waste- Recycling companies - Non-recyclable waste- Local Municipal Landfill
General Hazardous Waste	Spill clean-ups, Used PPE	Hazardous waste skip / drum	Hazardous Waste disposal facility/landfill
Waste Oil and used hydrocarbons	Equipment and machinery maintenance	External service provider to collect used oils and or hydraulic fluids in a sealable container.	Removed by external service provider for safe disposal or recycling.
All types of accepted e-waste goods	Onsite e-waste recycling, recovery and treatment activities (sorting, dismantling, granulation, shredding etc.)	Recyclable fractions to be Collected and stored in bulk bags and or dedicated skips, bins or bunkers.	Sold to upstream vendors
		Non-recyclable fractions to be disposed of.	Landfill or waste disposal facility
Lithium-ion batteries	Onsite LIB recycling, recovery and treatment activities (sorting, dismantling, granulation, shredding etc.)	Recyclable fraction (black mass) to be stored in bulk bags and or dedicated skips, bins or bunkers. Non-recyclable fractions (spent saline solution, fine mixed materials, contaminated plastics, separator material, dust and other non-recoverable residues) to be disposed of.	Sold to upstream vendors (In and out of the country) Waste disposal facility or secondary recovery

4.1.6. Administrative Buildings

The proposed site contains existing buildings that will be utilised for administrative and waste management activities. No additional structures are required, as the current infrastructure is sufficient to accommodate the proposed operations. The site is also adequately paved, making it suitable for the intended waste management activities.

4.2. Site Photographs



Photo 1: External view of existing site



Photo 2: Weighing area



Photo 3: E-waste and Printer cartridges storage bunkers



Photo 4: E-waste Sorting area



Photo 5: E-waste Dismantling stations



Photo 6: PCB grading designated storage containers



Photo 7: LIB Discharge Area



Photo 8: LIB Shredder Station



Photo 9: Shredded Material Storage



Photo 10: LIB Granulation Area



Photo 11: LIB Screening Area



Photo 12: Black mass



Photo 13: Proposed extension site



Photo 14: Extension site View of yard

5. LEGAL FRAMEWORK

5.1. Constitution of the Republic of South Africa (No. 108 of 1996)

Section 24 Environment.

“Everyone has the right -

- a) to an environment that is not harmful to their health or well-being; and*
- b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-*
 - i. prevent pollution and ecological degradation;*
 - ii. promote conservation; and*
 - iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”*

The facility must be managed to prevent adverse environmental consequences and to meet the constitutional requirements.

5.2. National Laws and Regulations

5.3. National Environmental Management Act (No. 107 of 1998) as amended in 2017

The NEMA is framework legislation in South Africa that governs environmental management.

Section 2: Environmental Management Principles

“Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.”

Section 28: Duty of care and remediation of environmental damage

“Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.”

Section 30: Control of incidents

Deals with the identification, reporting and remediation of environmental incidents.

- *NEMA EIA Regulations (GNR 982 as amended in 2017)*

These regulations prescribe the process that needs to be followed in the EIA process, including the relevant timeframes and requirements for the public participation as part of the process. It also stipulates specific requirement for the reports that must be generated as part of the EIA process, including the Environmental Impact Report.

- *Listed activities considered*

The proposed waste management activities entail extending operations to the adjacent building at 28-32 Laub Street. By completing the proposed activities, Revive Africa will have an increased capacity to store hazardous substances and increase their operational capacity.

5.4. National Environmental Management Waste Act (No. 59 of 2008) as Amended

Provides the legal framework for the management of general and hazardous waste in South Africa to protect health, wellbeing and the environment by providing reasonable measures for waste management. The measures contained in the NEM:WA provides a sound framework for waste management that must be implemented.

- **Waste Classification and Management Regulations (23 August 2013)**

The purpose of these Regulations is to regulate the classification and management of waste, to prescribe requirements for the disposal of waste to landfill and prescribe general duties of waste generators, transporters and managers. The facility needs to comply with the requirements of the regulations.

- **National Waste Information Regulations (13 August 2012)**

The purpose of these Regulations is to regulate the collection of data and information to fulfil the objectives of the national waste information system. The facility needs to report the details of the waste recovered at the facility. Records of waste managed at the facility must also be kept.

Revive Africa is a registered facility and reports data on the GWIS system

- **Gauteng Waste Information Regulations (15 September 2004)**

The objective of the regulations is to create a waste information system for Gauteng (GWIS). The facility must keep records of the quantities of waste received for recovery and recycling report the quantities of waste managed at the facility on GWIS on a quarterly basis.

- **Listed activities triggered**

In terms of the NEMWA, waste management activities that are listed in regulations published under NEMWA may not be undertaken without a WML. The listed activities for which a WML is required are contained in Government Notice (GN) 921. Category A activities require a WML and a BA must be conducted, and Category B activities require a WML and a full Scoping and EIA must be conducted. The proposed waste management activities at Revive Africa therefore triggers the following activity under Category B of GN 921.

Table 2: Listed activity triggered in terms of GNR 921

GNR 921 - Listed activity	Description of listed activity
B (2)	The reuse or recycling of hazardous waste in excess of 1 ton per day, excluding reuse or recycling that takes place as an integral part of an internal manufacturing process within the same premises.
B (3)	The recovery of waste including the refining, utilisation, or co-processing of the waste at a facility that processes in excess of 100 tons of general waste per day or in excess of 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises.
B (4)	The treatment of hazardous waste using any form of treatment at a facility that processes in excess of 1 ton per day calculated as a monthly average, excluding the treatment of effluent, wastewater, sewage or organic waste using composting or any other organic waste treatment.
B (10)	The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).

The planned changes will result in Revive Africa to increase their waste processing capacity by 600 tonnes per annum for PCBs and 1 440 tonnes per annum of LIBs based on the 4 tonnes a day processing capacity.

Revive Africa therefore must undertake a Scoping and Environmental Impact Reporting process and apply for a WML for the proposed activities to be legally undertaken in terms of the NEMWA.

- ***Norms and Standards for the Storage of Waste***

The facility is registered in terms of the Norms and Standards for Storage of Waste in terms of GN 926 of November 2013 (Reg Nr: 12/9/11/ST574/3).

- ***Waste Classification and Management Regulations***

The purpose of these Regulations is to regulate the classification and management of waste, to prescribe requirements for the disposal of waste to landfill and prescribe general duties of waste generators, transporters and managers. The facility needs to comply with the requirements of the regulations.

Any and all waste streams which may be generated during the operation of the Revive Africa's Waste Management Facility which are not previously classified will be classified and managed in terms of these regulations.

5.5. National Waste Management Strategy (NWMS) 2020

The National Waste Management Strategy (NWMS) 2020, published under the National Environmental Management: Waste Act, 2008 (Act 59 of 2008), provides the national policy framework for integrated waste management in South Africa. The Strategy promotes the implementation of the waste management hierarchy and supports the transition to a circular economy by prioritising waste avoidance, reduction, reuse, recycling and recovery, while ensuring the environmentally sound management of residual wastes.

The proposed recycling facility aligns with the objectives of the NWMS by facilitating the recovery of valuable materials from lithium-ion batteries (LIBs) and printed circuit boards (PCBs), thereby reducing the quantity of waste disposed of to landfill, promoting resource efficiency, and contributing to the sustainable management of electronic waste. The facility also incorporates measures to protect human health and the environment through the implementation of appropriate waste handling, storage, treatment and disposal practices.

Figure 6 illustrates the waste management hierarchy, which underpins the waste management approach adopted for the proposed facility. Consistent with the principles of the NWMS, Revive Africa is committed to implementing a zero-waste-to-landfill philosophy by maximising the recovery, reuse and recycling of materials generated through its operations, while supporting its clients in diverting waste from landfill wherever practicable. Residual wastes that cannot be recovered or recycled will be managed and disposed of in accordance with applicable legislative requirements and recognised best practice.

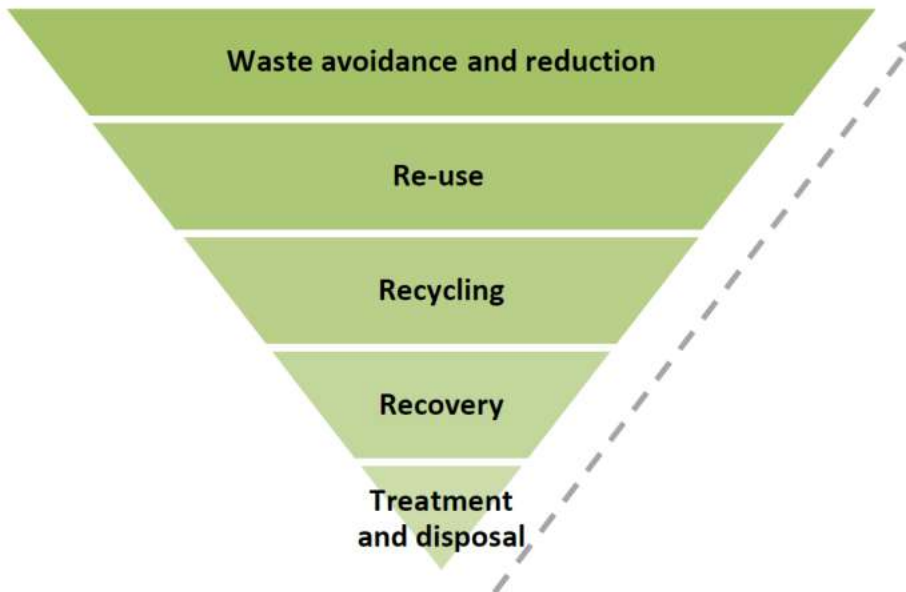


Figure 6: Waste Management Hierarchy (NWMS, 2011)

- **National Waste Information Regulations (13 August 2012)**

The purpose of these Regulations is to regulate the collection of data and information to fulfil the objectives of the national waste information system.

The facility is already registered, with the Gauteng Waste Information System and thus no additional registrations is anticipated.

- **Gauteng Waste Information Regulations (15th September 2004)**

The objective of the regulations is to create a waste information system for Gauteng (GWIS). The facility must register with the Department and report the quantities of waste managed at the facility.

List of persons conducting the following activities within Gauteng Province must register on the Gauteng Waste Information System (Gauteng Waste Information System) in terms of Regulation 3(2) of National Waste Information Regulations, 2012:

Generators of waste

- Generators of hazardous waste in excess of 20kg per day,
- Recovery or recycling of waste (Waste Re-processor),
- Recovery of energy from general waste (more than 3 tons per day),
- Recovery of waste at facility that has a capacity to process more than 5 tons of general waste per day,
- Recovery of hazardous waste regardless of size or capacity of the facility,
- The scrapping or recovery of motor vehicles at a facility that has an operational area of more than 500m²,
- Recycling of waste that has the capacity to process more than of 5 tons of general waste per day, and

- Recycling of hazardous waste regardless of size or capacity of the facility.

Treatment of waste

- Treatment of general waste at a facility that has the capacity to process more than 10 tons of general waste per day excluding the treatment of effluent, wastewater or sewage, and
- Treatment of hazardous waste regardless of size or capacity of the facility.

Disposal of waste

- Disposal of general waste to land at a facility covering an area in excess of 200m², and
- Disposal of any quantity of hazardous waste to land.

Transportation of hazardous waste

- A person who transports more than 10 kg/d of hazardous waste.

Transfer station of waste

- A person who operates a waste transfer facility that has capacity to store in excess of 100 m³ of general waste, and
- A person who operates a waste transfer facility that has capacity to store in excess of 35 m³ of hazardous waste.

The following activities are required to submit monthly data to the GWIS.

- A transporter removing hazardous waste from Gauteng Province for treatment or disposal to another province or country,
- A person who operates a general waste landfill site facility covering an area in excess of 200m²
- A person who operates a hazardous waste landfill site facility,
- A person who operates a general waste treatment facility that has the capacity to process more than 10 tons of general waste per day,
- A person who operates a hazardous waste treatment facility,
- A person who operates a recycling facility that has the capacity to process more than of 5 tons of general waste per day,
- A person who operates a hazardous waste recycling facility,
- A person who operates a facility for scrapping or recovery of motor vehicles that has an operational area of more than 500m²,
- A person who operates a facility that recover energy from general waste (more than 3 tons per day), and
- A person who operates a facility that recover waste at the facility that has a capacity to process more than 5 tons of general waste per day.

5.6. International protocols and conventions

a. Basel Convention on the Control of Trans-boundary Movements of Hazardous Waste (22 March 1989)

The overarching objective of the Basel Convention is to protect human health and the environment against the adverse effects of hazardous waste with a specific scope that covers the trans-boundary movement thereof. Applicable to the control of trans-boundary movements of hazardous waste from one country to another.

The operation of Revive Africa aligns with the vision of the waste hierarchy as the operations specialise in the recovery and recycling of hazardous waste, thus reducing the need for disposal. The impacts derived from the operation of the Revive Africa facility on the overall waste footprint of South Africa are considered positive.

5.7. National Water Act (No. 36 of 1998)

The purpose of this Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors -

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use;
- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety;
- Managing floods and droughts, and for achieving this purpose, to establish suitable institutions and to ensure that they have appropriate community, racial and gender representation.

5.8. Gauteng Province Environmental Management Framework (GPEMF) and City of Johannesburg Spatial Development Framework (SDF)

The Gauteng Province Environmental Management Framework ("GPEMF") provides for the exclusion of certain listed activities as specified in GNR 164 of March 2018, if the proposed facility falls within Zone 1 or Zone 5 of the GPEMF. The facility is within Zone 5-Industrial and Large Commercial Focus Zone (Figure 7), which streamlines non-polluting industrial and large-scale commercial developments in existing industrial areas and severely degraded areas close to infrastructure. The proposed waste management facility is thus, aligned with the GPEMF.

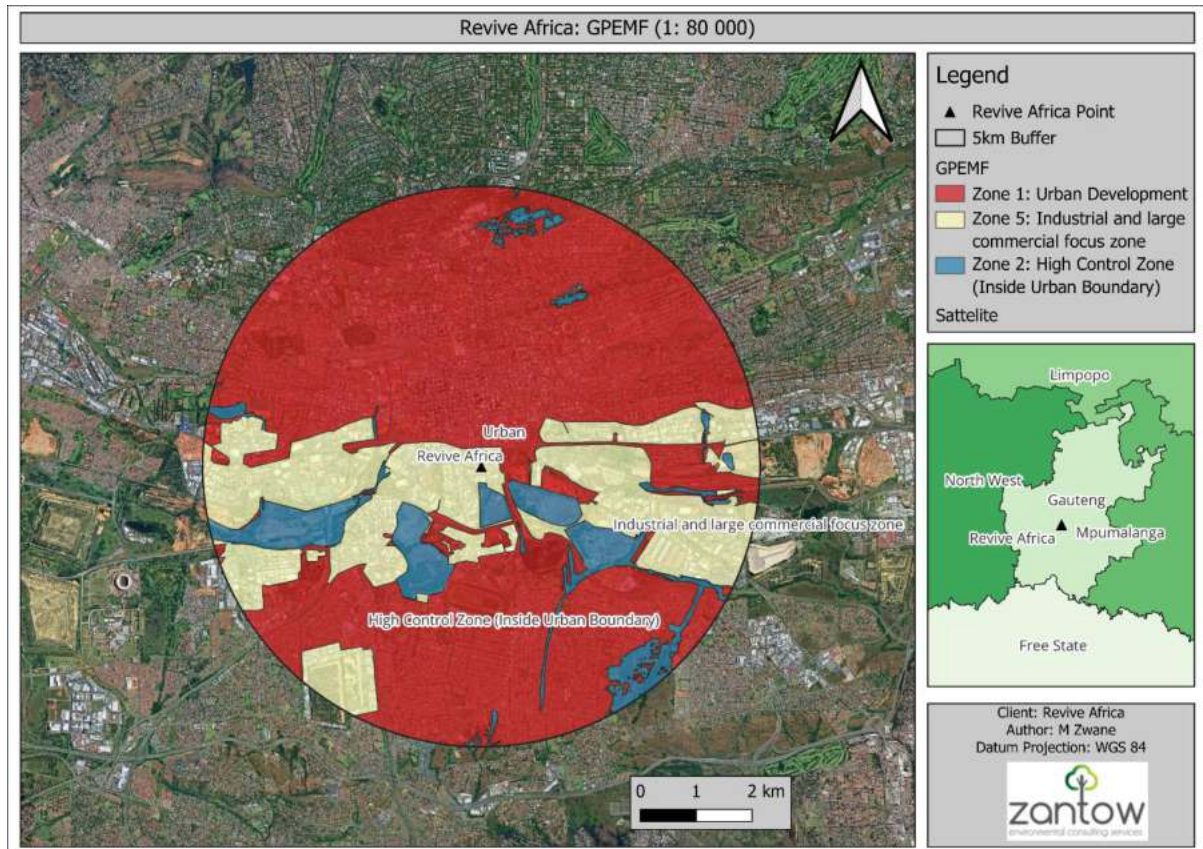


Figure 7: Gauteng Province Environmental Management Framework Zones

- **Specifications for Pollution Buffers**

The GPEMF standard outlines the following:

- “1) *Buffer zones for pollution sources from various industrial facilities, as Indicated in point 2 and as per the Gauteng Pollution Buffer Zones Guidelines, March 2017, below must be adhered to.*
- 2) *The specific sizes for the preferred pollution buffer or minimum pollution buffer must be complied with as follows:*
 - *Best case buffer of 1 500m and worst-case buffer of 750m must be maintained in category 1 industries, such as Sasol, Arcelor Mittal, Scaw Metal, Eskom power stations etc. as per paragraph 6.2.1 of the Gaute111 Pollution Buffer Zones Guidelines, March 2017.*
 - *Best case buffer of 500m and worst-case buffer of 250m must be maintained in category 2 industries, such as container depot In City Deep, panel beater workshops, tanneries etc. as per paragraphs 6.2.2 and 7.1 of the Gauteng Pollution Buffer Zones Guidelines, March 2017.*
 - *Best case buffer of loom and worst-case buffer of 50m must be maintained in category 3 industries, such as warehousing and distribution operations as per paragraphs 6.2.3 and 7.1 of the Gauteng Pollution Buffer Zones Guideline, March 2017.*
 - *Best case buffer of 800m and worst-case buffer of 500m must be maintained for Sewage treatment works as per paragraphs 6.2A and 7.1 of the Gauteng Pollution Buffer Zones Guideline, March 2017.*
 - *Best case buffer of 400m and worst-case buffer of 200m must be maintained for general landfill sites (Communal, small, medium, and large) as per paragraphs 6.2.5 and 7.1 of the Gauteng Pollution Buffer Zones Guideline, March 2017.*
 - *Best case buffer of 2000m and worst-case buffer of 1000m must be maintained for Hazardous Landfill sites as per paragraphs 6.2.5 and 7.1 of the Gauteng Pollution Buffer Zones Guidelines, March 2017.*

- *Best case buffer of 100m and worst-case buffer of 0m must be maintained for mine dumps (rock dumps or stockpiles) as per paragraphs 2.6 and 7.1 of the Gauteng Pollution Buffer Zones Guideline, March 2017.*
- *Best case buffer of 1000m and worst-case buffer of 500m must be maintained for mine sump's dams and ash dumps as per paragraphs 6.Z.7 and 7.1 of the Gauteng Pollution Buffer Zones Guideline, March 2017.*
- *Best case buffer of 5000m and worst-case buffer of 2000m must be maintained for the Pelindaba nuclear facility complex as per paragraphs 6.Z.8 and 7.1 of the Gauteng Pollution Buffer Zones Guideline, March 2017."*

The proposed site is located within Zone 5 of the GPEMF. In accordance with the applicable standards, Category 2 industries are required to maintain a best-case pollution buffer of 500 m and a worst-case pollution buffer of 250 m. The land uses surrounding the proposed site, within both buffer zones, are predominantly industrial in nature. The applicable buffer zones for the proposed facility are illustrated in the figure below.

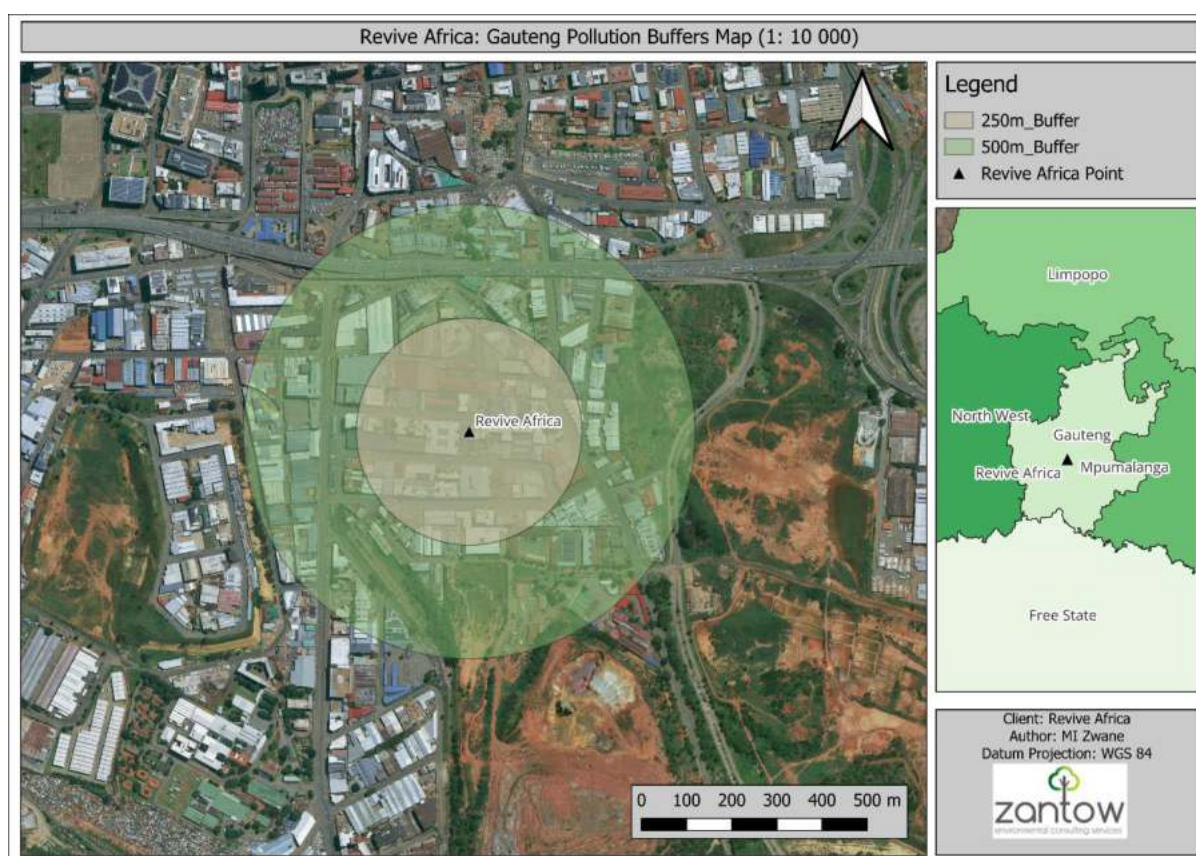


Figure 8: Gauteng Pollution Buffers

The City of Johannesburg Spatial Development Framework (SDF) provides the municipality's long-term spatial vision and serves as the primary policy document guiding land use and development. The SDF aims to promote sustainable, efficient and equitable spatial development by directing growth towards strategic nodes and corridors, encouraging compact mixed-use development, coordinating infrastructure investment, protecting environmental resources, and supporting economic development. The proposed development has been assessed for consistency with the objectives and spatial directives of the SDF. The site is within an industrial node in terms of the SDF and thus aligns with CoJ's developmental objectives.

5.9. City of Johannesburg Municipal Bylaws and Plans

The proposed development will comply with the applicable municipal by-laws, policies and planning instruments administered by the City of Johannesburg Metropolitan Municipality. Particular consideration has been given to the City of Johannesburg Waste Management By-law, 2021, which establishes the municipal requirements for waste minimisation, separation at source, storage, collection, transportation, recycling, treatment and environmentally sound disposal of waste. The by-law further places a duty on waste generators to implement measures that prevent pollution, protect public health and minimise nuisance, while promoting waste reduction, reuse, recycling and recovery in accordance with the waste management hierarchy. In addition, the proposed development has been considered within the context of the City of Johannesburg Spatial Development Framework (SDF), which guides sustainable land use, spatial transformation, infrastructure investment and environmental protection across the municipality. The proposed recycling facility supports the objectives of these municipal planning instruments by promoting resource recovery, diverting electronic waste from landfill, contributing to the circular economy, and implementing appropriate waste management and pollution prevention measures throughout the operational life of the facility.

5.10. National Environmental Management: Air quality Act (No. 39 of 2004)

The object of this Act is-

- (a) to protect the environment by providing reasonable measures for-
 - (i) the protection and enhancement of the quality of air in the Republic;
 - (ii) the prevention of air pollution and ecological degradation

The act contains general measures for the control of facilities that may cause air pollution. The act places a duty to prevent air pollution and mandates the licencing of facilities such as the proposed metal recovery facility.

Section 46 of the NEM: AQA states that a licensing authority may, by written notice to the holder of a provisional atmospheric emission License or an atmospheric emission License, vary the License -

- (a) if it is necessary or desirable to prevent deterioration of ambient air quality;
- (b) if it is necessary or desirable for the purposes of achieving ambient air quality standards;
- (c) if it is necessary or desirable to accommodate demands brought about by impacts on socio-economic circumstances and it is in the public interest to meet those demands;
- (d) at the written request of the holder of the License.

The proposed waste management activities entail increasing the footprint of the facility, increasing storage and recycling capacity. Category 8 listed in GNR 893 promulgated in terms of the National Environmental Management Air Quality Act (No 39 of 2004) (NEM: AQA), speaks to the treatment of Hazardous and General Waste by applying heat.

Revive Africa will not apply heat during their treatment process and therefore does not trigger Category 8 and will not require an Atmospheric Emissions License (AEL).

6. NEED AND DESIRABILITY OF THE PROPOSED WASTE MANAGEMENT ACTIVITIES

The below need and desirability assessment was developed according to the Integrated Environmental Management Guideline Series 9: Guideline on Need and Desirability and in terms of the EIA Regulations.

6.1. Need and Desirability in terms of Type of Waste Received and Processed by Revive Africa

Revive Africa undertakes the recycling of electronic and electrical waste equipment (e-waste), mainly the printed circuit boards (PCBs) and lithium-ion batteries (LIBs) contained within consumer electronics as well as IT and telecommunication devices. E-waste is classified as a hazardous waste and is strictly governed by environmental laws and more specifically the requirements of the NEMWA.

E-waste is recognised as the fastest growing waste stream in the country, and due to the containment of hazardous components requires specialised handling procedures. The sustainable management of the e-waste is of concern due to the adverse environmental and health impacts when handled unsustainably. PCBs contain several harmful elements such as lead, cadmium, and brominated flame retardants (BRFs) amongst others, whilst LIBs contain flammable electrolytes, toxic material (Lithium salts and Hydrogen Fluoride (HF) gas, and cathode metals) and have high energy density which cause rapid and uncontrollable heat release that can cause explosions. In South Africa the e-waste recycling sector is still in its infancy, with limited formal e-waste recyclers and thus most of the generated e-waste is handled by the informal sector using harmful methods.

Therefore, the sustainable management of PCBs and LIBs is essential, to ensure that e-waste is managed in a sustainable manner that is not detrimental to the environment and human health. The management of e-waste through formal sector is also essential in keeping data on the e-waste generated and managed within the country to assist authorities in planning for sustainable waste management.

Currently, Revive has dismantling stations for the manual disassembly of PCBs and a pilot project for the recycling of LIBs. The facility recycles less than 500 kilograms of e-waste at their facility, operating below the threshold for a waste management License (WML). Revive now proposes to establish a full-scale e-waste recycling plant for both PCBs and LIBs. The waste management activities entail increasing the volumes of e-waste accepted, increasing their footprint to the adjacent building in 28-32 Laub Street, New Centre Johannesburg and e-waste management processes to include recycling, treatment and recovery of e-waste and LIBs.

The proposed additional waste management activities and upgrades would allow Revive Africa to further streamline their process. With the modifications made, the facility will be able to accept and process larger volumes of waste at any given time.

6.2. Need and Desirability in terms of South African Legislation

E-waste and its components in South Africa are governed by the NEM: WA as well as Norms and Standards and Regulations promulgated in terms of the Act, as well as the waste management hierarchy as noted in the National Waste Management Strategy (NWMS). In terms of e-waste, the Extended Producer Responsibility Regulations (EPR) (GNR 1184), 5 November 2020 and the Norms and Standards for Disposal of Waste to Landfill (GNR 636), effective 23 August 2021 are particularly applicable. The EPR regulations set forth targets for producers of electronic and electrical to collect the end-of-life products and manage them in a sustainable manner through EPR schemes, in the case of Revive Africa the EPR Scheme for Electrical & Electronic Equipment as well as the EPR Scheme for the Portable Battery Sector are applicable.

Revive Africa is registered as a recycler with an EPR scheme in South Africa, assisting producers with meeting their EPR scheme targets by through recycling and recovery. The operation of Revive Africa

also ensures the sustainable management of e-waste and associated components diverting them from landfill in fulfilment of the banning of the waste stream from landfill sites. The proposed waste management activities at Revive Africa will result in increased storage and processing capacity for e-waste, which will result in increased targets for the facility to assist producers in meeting their EPR scheme targets and the sustainable management of e-waste in line with the waste management hierarchy ensuring that waste is not landfilled in fulfilment of the e-waste ban.

By providing a licensed operation, Revive Africa is able to not only accept a hazardous waste stream for processing, limiting the need for disposal, but also able to generate viable and valuable products for other industries.

6.3. Need and desirability in terms of waste regional management

The latest official statistics released by the DFFE on waste management in South Africa was conducted in 2018, captured in the State of Waste Report. According to the report, 52 million tonnes of hazardous waste was generated in 2017, with 92.7% of the total volume of waste disposed to landfill and only 6.6% was recycled and recovered. Although e-waste accounted for only 0.7% of the total volume of hazardous waste generated in 2017, it has been recognised as the fastest growing waste stream with majority of it stockpiled (86.4%) and only 9.7% recycled or recovered. The stockpiling of e-waste has been recognised as the most used method for the waste stream as many waste generators believe the waste has an inherent value and thus, is not sent for recycling or even disposal. Furthermore, in developing countries the lack of adequate infrastructure for the sustainable management of e-waste contributes to the stockpiling of e-waste.

The Gauteng province is the hub of e-waste management, with more than 100 formally registered companies that handle e-waste, however, many are involved in the collection, consolidation and dismantling activities. Thus, a significant need still exists to increase the sustainable management of e-waste through recycling and recovery of materials. Particularly for information and communication technology (ICT) and consumer electronics made up the bulk of the waste stream (79%). The proposed waste management activities for Revive Africa demonstrates itself as one that is required within the region, first on the basis of the need for more formal and duly authorized waste recycling and recovery facilities in the country and secondly, based on the type of waste managed at the facility which accounts for the majority of e-waste that is currently generated in the region. The proposed activities will increase Revive Africa's capacity to recycle and recover waste.

6.4. Need and Desirability in terms of Socio-Economic Benefits

The proposed waste management activities will provide employment opportunities for additional persons during the operational phase. Revive Africa is committed to employing and training local personnel as far as reasonably possible in the recycling and recovery of materials from e-waste. The use of local labours and skilled workers would have a positive impact on the surrounding community. The proposed activities will contribute to local economic development and uplift the livelihoods of the persons that will be employed.

The facility currently employs approximately 20 persons. The proposed waste management activities and upgrades to the facility will also contribute to additional job security, as it is estimated that a total of 18 permanent jobs will be created from the project.

Furthermore, Revive Africa is committed to giving back to the community, particularly the disabled community. This is demonstrated through their support to the Mandeville Para Swimming Club, which is South Africa's only club dedicated to teaching disadvantaged children with a disability to swim. Through the waste management activities Revive Africa can continue to support additional initiatives in the country that benefit society beyond the provision of employment opportunities.

6.5. Need and Desirability in terms of the Location and Accessibility

The proposed waste management activities will be conducted within the footprint of an existing industrial site that has been completely transformed and identified as an industrial zone in terms of the 2022 Gauteng Provincial Environmental Management Framework (GPEMF) and the City of Johannesburg's 2024 Spatial Development Framework (SDF). The proposed site is in line with the compatible land uses for Zone 5: Industrial and large commercial focus zone in terms of the GPEMF. Therefore, no virgin land will have to be transformed, which is aligned with CoJ's SDF's objective to opt for brownfield development over greenfield development allows us to preserve the limited natural land available, which is a crucial provider of valuable ecosystem services.

The site is situated in New Centre, an industrial area in Johannesburg, with existing access that is conveniently close to major roads to and from the site. The property is zoned for industrial purposes which is in line with the proposed waste management activities. Moreover, the site is well serviced by public transport allowing easy access for personnel working at the site.

6.6. Conclusion Regarding the Need and Desirability of the Proposed Activities

A clear need exists to decrease waste disposal and transition towards more sustainable waste management practices that prioritise keeping products circulating in the economy for longer to not lose the valuable materials contained in them and to allow for their reuse to reduce dependency on virgin materials where possible. By implementing methods such as the recycling or recovery of waste, disposal of waste is avoided all together, which is aligned with policies and regulations and South Africa's transition towards a more circular economy. The proposed waste management activities will increase Revive Africa's capacity to recycle and recover materials contained in e-waste and keep the hazardous components from the environment through safe disposal methods.

Existing access to the site has already been established. The proposed waste management activities will provide employment opportunities for additional persons over the operational phase of the facility. The facility currently employs approximately 20 persons and the proposed waste management activities will contribute to job security. The proposed project will therefore contribute to local economic development and uplift the livelihoods of the persons that will be employed. The proposed waste management facility at Revive Africa is in line with the waste hierarchy in terms of the National Waste Management Strategy (NWMS) and the NEMWA and will ensure the sustainable management of e-waste and uphold the regulations that ban the disposal of waste to landfill.

The proposed project will contribute to local economic development by supporting the growth of the circular economy, creating employment, and enhancing the sustainable management of electronic waste. The proposed waste management activities are aligned with the principles of the waste management hierarchy as set out in the National Waste Management Strategy (NWMS) 2020 and the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEM). Through the recovery, reuse and recycling of valuable materials from electronic waste, the facility will promote resource efficiency, reduce reliance on landfill disposal, and support South Africa's transition towards a more sustainable and circular economy.

7. DESCRIPTION OF REASONABLE AND FEASIBLE ALTERNATIVES

This section evaluates the alternatives that have been identified and will be included in the environmental impacts associated with the alternatives, compared to the proposed alternative. The pros and cons of the different alternatives will be highlighted to ensure that a transparent decision will be reached on the best alternative.

7.1. Site selection process

The site selection was guided by the existing operations of Revive Africa and the availability of suitable properties capable of accommodating the proposed activities. The selected site is a brownfield that has already been fully developed for commercial and light- to medium-industrial use. Consequently, no virgin land will be disturbed for the facility. Additionally, the site is not located near any sensitive environmental features that could be impacted by the proposed activities.

Other factors influencing the site selection include available infrastructure and space. The site currently supports Revive Africa's e-waste management activities, which are below the threshold requiring a waste management license. The additional space required to accommodate increased material intake, and processing capacity is adjacent to the existing operations. Both sites are under the ownership of the same entity that operates Revive Africa, simplifying management and operational continuity.

Given these considerations, alternative sites were not pursued. Relocating the existing operations or acquiring a separate facility would be less feasible and would disrupt ongoing operations while attempting to accommodate the growing demand for e-waste management services.

The table below presents a detailed evaluation of the proposed site.

Table 3: Site selection matrix

Environmental consideration	Site evaluation	
	New Centre	
	Yes	No
Within a 3000m radius of the end of an airport landing strip.		x
Within an unstable area (fault zone, seismic zone, dolomite, sinkholes).		x
Within 500m of water resource.		x
Nodality with respect to raw materials.		x
The distance to the boundary of the nearest residential area.	0.5 km	
Availability of land for production volumes.	x	
Accessibility in terms of road networks.	x	
Suitability of zoning	x	

The site location alternatives will not further be addressed in this study as the site is preferred from a logistical, financial and strategic perspective.

7.2. Technology Alternatives

According to the European Integrated Pollution Prevention and Control (IPPC) for Best Available Techniques (BAT), the technique for choosing the best available technology should consider potential environmental impacts associated with the chosen technology, the ease of implementing an environmental management system to manage and mitigate impacts, the economic efficiency, size and the raw material that is intended to be used.

7.2.1. Printed Circuit Board (PCB) Recycling

PCBs contain both valuable (Au, Ag, Cu, Pd, plastics, etc.) and hazardous substances, making their disassembly a crucial process in the recycling of PCBs. The disassembly phase involves the removal of electrical components (capacitors, resistors, inductors, integrated circuit, cooling fin, etc.) from the

PCB substrate. This process can be conducted using either thermal, mechanical, chemical, or automated methods.

Thermal disassembly uses elevated temperatures to separate electronic components (EC) from printed circuit boards (PCBs), achieving high recovery rates but with high energy consumption, significant environmental impacts, and hazardous emissions. Chemical disassembly uses solvents to dissolve or separate PCB materials and is effective in material recovery, although it poses challenges related to the use of hazardous chemicals, waste management, and operational costs. Consequently, thermal and chemical methods were not considered further due to their high energy requirements, environmental impacts, safety risks, and limited suitability for large-scale implementation.

a. Preferred Technology: Mechanical Disassembly

Mechanical disassembly methods rely on physical processes to separate the electrical components EC fractions from the basal plate and to break down PCBs into smaller fractions. This often involves manual separation of EC from the basal plate using hand tools (hammers, screw drivers, etc.) and shredders and crushers to breakdown the PCBs into smaller fractions. Followed by methods such as magnetic separation, eddy current separation, electrostatic separation, and density-based methods to separate metals from other constituents. Mechanical disassembly is often used as a pre-treatment step to concentrate the metal-rich fractions. Mechanical methods offer low energy requirements and low to moderate environmental impact based on the accuracy of hazardous material removal from the PCBs. The disadvantages of mechanical disassembly methods are that they are labour-intensive and often results in incomplete recovery of EC, and due to the use of labour there lies a risk of exposing workers to hazardous.

b. Alternative 1: Automatic disassembly methods

Automated PCB disassembly processes involve the use of advanced technologies, specifically edge computing and the Internet of Things (IoT), to streamline the recycling process and efficiently dismantle electronic components from boards with minimal human intervention. The automated disassembly methods use sensors, cameras, and smart devices to identify and track boards as they move through the process. Data collected is analysed by computers and machine learning algorithms, which guide robotic arms to carefully dismantle components like resistors, capacitors, and chips. After disassembly, parts are sorted by material and usability, and EC's as well as other recyclable materials such as metals, plastics, and silicon are recovered. Automation enables high throughput and consistent recovery efficiency, while reducing safety risks to operators and minimizing exposure to hazardous substances such as solder fumes, resins, or heavy metals. Advanced sensors and vision systems allow for precise identification and segregation of components, enhancing material purity for downstream recycling. The main limitations are the high initial capital cost, complex maintenance requirements, and the need for skilled operators to program and monitor the system.

7.2.2. Lithium-ion Battery Recycling

Lithium-ion batteries (LIBs) are key components for many electrical and electronic equipment (EEE) being adopted as the main energy source for various EEE devices. A lithium-ion battery (LIB) cell consists of six main components: anode, cathode, electrolyte, separator, current collectors, and housing. The anode typically has a copper collector coated with graphite, binder, and additives, while the cathode uses an aluminium collector coated with active materials, additives, and ligands. The type of active cathode material (lithium cobalt oxide (LCO), lithium nickel-manganese-cobalt oxide (NMC), lithium iron phosphate (LFP), lithium nickel-cobalt-aluminium oxide (NCA), or lithium manganese oxide (LMO)) determines the specific chemistry of the battery. The electrolyte is a mix of lithium salts, organic solvents, and additives, and the separator, usually polypropylene or microporous polyethylene, prevents short circuits. Finally, the housing, made from metals or plastics, protects the battery from external damage.

The LIB recycling process generally consists of three main stages following collection and sorting, namely pretreatment, separation, and material recovery. The recycling stage enables the recovery of valuable materials, including lithium, cobalt, nickel, manganese, copper, aluminium, and graphite, for reuse in new batteries or other applications. Revive Africa's proposed operations will focus primarily on the pretreatment phase, which involves safely processing spent LIBs to recover battery fractions suitable for downstream recycling.

The pretreatment phase focuses on the removal of non-target components and liberation of the cathode and anode active materials, commonly referred to as black mass. The main pretreatment steps include:

- **Discharge:** Removal of residual electrical energy to minimise the risk of short circuits, thermal events, or fires during processing.
- **Dismantling or disassembly:** Separation of battery components, including cells, casings, electronic modules, and structural materials.
- **Separation:** Physical separation of recovered fractions, including black mass, metals, plastics, and other components.

Various lithium-ion battery (LIB) recycling technologies are available, including thermal, mechanical, hydrometallurgical, and direct recycling approaches. Mechanical pretreatment has been identified as the preferred technology for Revive Africa's operations due to its lower environmental impact, reduced energy requirements, improved safety profile, and suitability for scalable recycling operations. However, not all available technologies are considered suitable for the proposed Revive Africa operations. Thermal-based recycling technologies, including pyrolysis and roasting processes, were reviewed as part of the technology assessment but were not considered further in this EIR due to their high energy requirements, potential for atmospheric emissions, increased fire and safety risks, and the requirement for additional emission control infrastructure.

The proposed operations will therefore focus on mechanical processing technologies, which are considered more suitable due to their lower energy consumption, reduced environmental impacts, operational flexibility, and suitability for scalable recycling operations. Within the mechanical processing pathway, the key technology considerations include battery discharging, dismantling/disassembly, and separation processes. The preferred technologies selected for each stage were evaluated against alternative methods based on environmental performance, safety considerations, operational feasibility, scalability, and resource requirements.

a. Preferred LIB Recycling Technologies

The proposed lithium-ion battery (LIB) recycling facility will utilise mechanical treatment processes to safely discharge, dismantle and separate battery components while minimising environmental impacts. Mechanical pretreatment relies on physical processes rather than high-temperature or chemical treatment, resulting in lower energy requirements, reduced emissions, and improved recovery of valuable materials. The preferred technologies for each stage of the process are described below.

Discharging: Salt Solution Discharge

Prior to dismantling and further processing, lithium-ion batteries (LIBs) must undergo a discharging process to remove residual electrical energy and reduce the risk of short circuits, thermal runaway, fires, or other safety incidents during handling.

Salt solution discharge has been identified as the preferred discharging technology for the proposed operations. This method involves immersing LIBs in a saturated salt solution, which provides a conductive medium that allows residual electrical energy to dissipate safely while reducing the risk of uncontrolled reactions during subsequent processing.

The main advantages of salt solution discharge include its operational simplicity, relatively low capital requirements, ease of implementation, and suitability for processing different LIB types and formats. The method does not require complex electrical infrastructure or specialised equipment, making it suitable for small- to medium-scale recycling operations. In addition, it provides a controlled approach to reducing battery reactivity prior to dismantling, thereby improving operational safety.

Appropriate management measures, including controlled handling of discharged batteries, management of spent salt solution, and prevention of contamination, will be implemented to minimise potential environmental impacts associated with the process.

Dismantling and Disassembly: Manual Dismantling

Following the safe discharge of lithium-ion batteries (LIBs), the batteries undergo dismantling to separate individual components, including casings, electronic modules, metals, plastics, and cell materials containing valuable recoverable fractions.

Manual dismantling has been identified as the preferred dismantling method for the proposed LIB recycling operations. This approach involves the use of hand tools and controlled manual processes to disassemble battery components and separate material fractions prior to further processing.

Manual dismantling provides several advantages, including flexibility in handling different LIB designs, chemistries, and battery formats, which can vary significantly across manufacturers and applications. The process also enables selective removal of components, reducing the risk of damaging valuable materials and allowing improved separation of recyclable fractions. In addition, manual dismantling requires lower capital investment, reduced operational complexity, and does not require advanced programming, specialised maintenance, or highly skilled technical operators associated with automated systems.

Separation: Physical and mechanical

Following the dismantling of lithium-ion batteries (LIBs), the separated battery fractions require further processing to recover valuable materials, including black mass, aluminium, copper, and other recyclable components. The separation process aims to remove impurities and improve the quality of recovered materials prior to downstream recycling processes.

Physical and mechanical separation has been identified as the preferred separation technology for the proposed LIB recycling operations. This approach relies on differences in the physical properties of battery components, such as particle size, density, magnetic properties, and electrical conductivity, to separate and recover valuable material fractions.

The process typically includes size reduction through crushing, followed by screening and sorting processes to separate black mass from larger metallic and plastic fractions. Magnetic separation is used to recover ferrous materials, while eddy current separation can be applied to recover non-ferrous metals, such as aluminium and copper. These methods can be conducted under controlled conditions, including wet or inert processing environments, to reduce the risk of hazardous emissions and improve operational safety.

Physical and mechanical separation is considered advantageous due to its relatively low energy requirements, limited use of hazardous chemicals, scalability, and compatibility with automated processing systems. These characteristics make it a suitable option for efficient material recovery while minimising environmental and occupational health risks.

b. Alternative LIB Recycling Technologies

Several alternative technologies were evaluated during the technology selection process. These alternatives were assessed against environmental performance, operational requirements, safety, flexibility and economic feasibility.

Discharging: Resistor-based discharge

Resistor-based discharge involves connecting LIBs to an external resistor system, allowing the remaining electrical energy to be gradually released through a controlled electrical circuit. This approach provides the potential benefit of recovering residual energy for reuse and may reduce energy losses associated with battery disposal.

However, resistor-based discharge requires specialised equipment, increased capital investment, and additional electrical infrastructure. The process can also be time-consuming when applied to large quantities of batteries and may not be economically viable for small- to medium-scale LIB recycling facilities. Furthermore, the complexity of managing multiple battery types and chemistries may limit operational flexibility.

Although resistor-based discharge provides an opportunity for energy recovery, the infrastructure requirements and associated costs make it less suitable for small- to medium-scale LIB recycling operations. Revive Africa will therefore utilise salt solution discharge as the preferred method.

Dismantling and Disassembly: Automated dismantling

Automated dismantling systems utilise robotic equipment, sensors, machine vision, and automated sorting technologies to disassemble LIBs with minimal human intervention. These systems can improve processing speed, throughput, and consistency while reducing direct worker interaction with potentially hazardous materials.

However, automated dismantling systems require significant initial capital investment, specialised technical expertise, and complex maintenance requirements. In addition, the variability in LIB designs and chemistries can present challenges for fully automated systems, requiring ongoing optimisation and programming adjustments to maintain efficiency.

Due to the current operational requirements, flexibility needed to process various LIB types, and the lower environmental and financial burden associated with implementation, manual dismantling has been selected as the preferred technology for the proposed operations. Automated dismantling is therefore considered the least preferred alternative technology.

Separation: Mechano-Chemical Separation

Mechano-chemical separation combines mechanical size reduction with chemical treatment to enhance the liberation of active materials and improve downstream recovery efficiency. The mechanical process increases the surface area of battery materials, while chemical reagents assist in separating and recovering targeted components.

Although mechano-chemical separation can improve material liberation and recovery performance, the requirement for chemical reagents increases operational complexity and introduces additional environmental considerations, including chemical management, waste handling, and potential impacts associated with reagent use.

7.3. No-go option

The no-go alternatives Revive Africa continuing with processing e-waste at current scale that is below the threshold for a waste management license. The increase in processing capacity would not only

benefit current operations but have positive impacts for e-waste management, which are currently still below 10% for the country. Should the application for the waste management license be rejected the operations would be forced to continue as is and operate within the facility's current operational capacity. If the application is rejected the operations will not have the opportunity to further evolve in order to remain competitive in the current market.

7.4. Conclusion Regarding the Considered Alternatives

The proposed activities will be undertaken within an existing industrially transformed site, and no additional virgin land will be disturbed. The site is suitably located, secured, and supported by existing infrastructure and access routes, making it suitable for the proposed waste management activities. No alternative sites were considered due to the suitability of the existing facility and the associated practical and financial implications of relocating the proposed operations.

The proposed recycling facility will contribute towards the sustainable management of e-waste in South Africa by enabling the recovery of valuable materials from end-of-life electrical and electronic equipment while reducing the potential environmental and human health risks associated with inappropriate disposal of hazardous components.

The technology alternatives assessment concluded that the preferred PCB and LIB recycling technologies provide the most appropriate balance between resource recovery efficiency, environmental performance, occupational health and safety, and operational feasibility. Energy-intensive thermal processes and chemically intensive processes were screened out due to their associated environmental impacts and management requirements. The selected mechanical-based recycling technologies are considered suitable for the proposed operations due to their scalability, reduced environmental impacts, and ability to recover valuable secondary raw materials.

Should the Waste Management License application be rejected, Revive Africa would be required to continue operating under its current conditions, limiting the company's ability to expand its recycling capacity and respond to market demand. This may result in longer-term economic implications, including reduced competitiveness and potential impacts on employment opportunities.

8. DESCRIPTION OF THE BASELINE ENVIRONMENTAL CONDITIONS

The site has been completely transformed by the existing industrial and associated activities. The following provides a description of the environmental features of the area.

8.1. Climate

The temperature of the region is mild with the highest temperatures recorded in December to February and the coldest in July and August. The winters can produce frosty mornings with strong cold fronts. The subject area falls within a zone of summer rainfall which is prevalent over most of the Gauteng Province with the majority of rain falling during afternoon thunderstorms in December and January of each year.

The climate of Johannesburg is mild, generally warm, and temperate, with dry winters and warm summers. The average annual temperature in Johannesburg is approximately 15.9 °C, while the mean annual rainfall is around 784 mm. Rainfall is highly seasonal, with the majority occurring during the summer months from December to March.

8.2. Hydrology

The project area is located in the Vaal-Orange Water Management Area (WMA) and the C22B Quaternary Catchment. The mean annual precipitation is moderate and approximately 690 mm/a, but significantly exceeded by potential evaporation estimated at approximately 1 600 and 1 700mm/a. Consequently, the majority of rainfall is lost through evapotranspiration, with only a small proportion contributing to surface runoff and groundwater recharge.

The presence of shallow, sandy soils derived from quartzitic bedrock, combined with extensive urban development in the project area, further reduces infiltration and enhances rapid runoff generation. The facility is in the process of developing a stormwater management plan to manage runoff from the waste management activities.

8.3. Topography

The natural slope of the site is generally gentle and typically less than 5%, however, localised steeper gradients may occur along engineered embankments, road cuttings, and drainage corridors. The topography is generally gently undulating, with localised low relief typical of the Highveld region.

8.4. Geology and soils

The Revive Africa site falls within the Siliciclastic lithological class, underlain specifically by the Central Rand Group of the Witwatersrand Supergroup. Siliciclastic rocks, which include siltstone, sandstone, and conglomerate, are the second most abundant type of sedimentary rock after mud rocks. These rocks form primarily through the accumulation and consolidation of mineral grains, mainly silicates, and serve as important reservoirs for water, oil, and natural gas. They also host economically significant minerals, including diamonds and gold.

Siliciclastic rocks are composed of three primary materials: framework grains, matrix, and cement. Framework grains - typically mineral particles or fragments of other rocks - make up the bulk of the rock. The matrix is a fine-grained material, such as clay, deposited along with the grains, while cement precipitates in the voids between grains after deposition. Framework grains and matrix are considered primary deposits, whereas cement is a secondary deposit formed post-deposition.

The Central Rand Group is dominated by quartzites, sandstones, and conglomerates, with quartzite being more than twelve times more abundant than shale. The majority of Witwatersrand gold occurs within this group, particularly in the Johannesburg and Turffontein Subgroups. The lithologies of the

Witwatersrand Supergroup are highly resistant to weathering, giving rise to shallow, sandy to sandy clay loam soils with generally low natural fertility and moderate permeability. The combination of shallow soils and fractured bedrock limits groundwater storage capacity, while exposed soils are potentially vulnerable to erosion if disturbed.

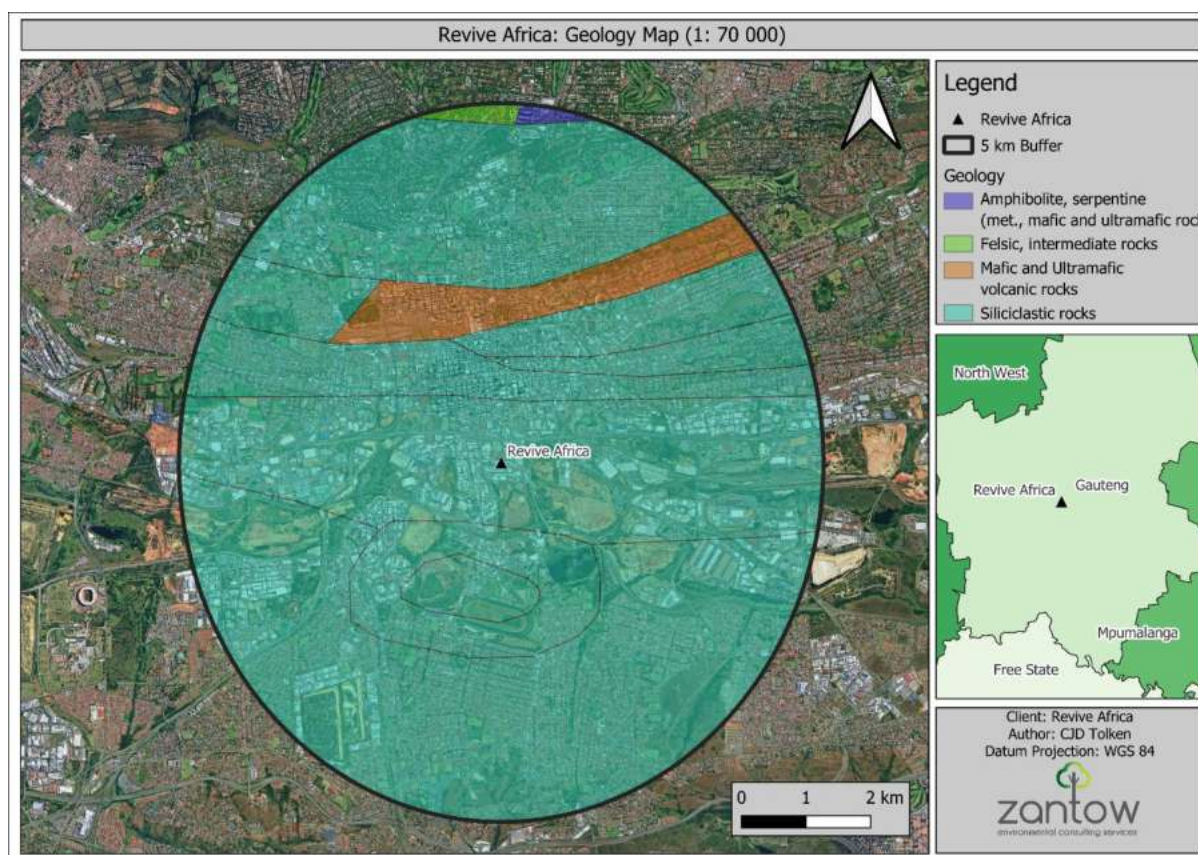


Figure 9. Geology of the area surrounding Revive Africa

8.5. Vegetation

The site has completely been disturbed by the existing industrial activities. No vegetation will be removed on the area in which the activity will be conducted.

The project area is situated in the Grassland biome (Mucina & Rutherford, 2006), which is characterised by herbaceous vegetation of relatively short and simple structure that is dominated by graminoids, usually of the family Poaceae. Woody plants are rare (usually low to medium-sized shrubs) or absent or are confined to specific habitats, such as smaller escarpments or koppies. Core grassland areas usually have deep, fertile soils although a wide spectrum of soil types occurs. Precipitation is strongly seasonal, and the growing season lasts approximately half the year (Mucina & Rutherford, 2006).

The project area overlaps the Soweto Highveld Grassland vegetation unit (Mucina et al., 2018). The Soweto Highveld Grassland vegetation unit is characterised as gently to moderately undulating landscape on the Highveld plateau, supporting short to medium-high, dense, tufted grassland dominated almost entirely by *Themeda triandra* and accompanied by a variety of other grasses such as *Elionurus muticus*, *Eragrostis racemosa*, *Heteropogon contortus* and *Tristachya leucothrix*. In places not disturbed, only scattered small wetlands, narrow stream alluvia, pans and occasional ridges or rocky outcrops interrupt the continuous grassland cover.

8.6. Heritage Resources

According to the National Screening Tool (**Annexure D**), the site selected for the proposed waste management facility has a very high sensitivity for the Archaeological and Cultural Heritage Theme.

The area is given a high sensitivity because of the Grade I Heritage site which is said to be within a 5km buffer and the Grade II Heritage sites which are within a 2km buffer from the proposed site.

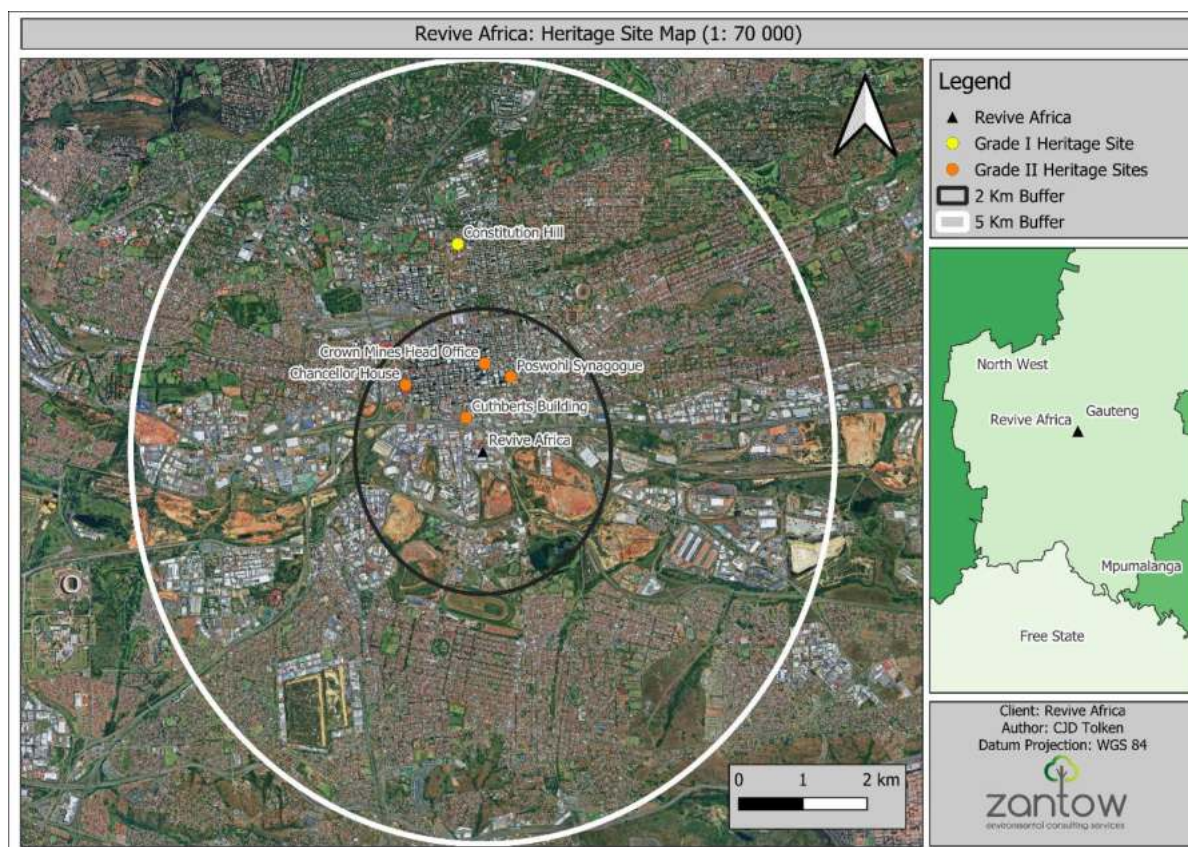


Figure 10. Heritage Site Location Map

The area has been previously developed, and no archaeological or cultural heritage resources were identified during construction or are currently present. In addition, the proposed area selected for the activities will be located within the bounds of the existing Revive Africa facility. Therefore, the proposed activities will have no impact on the Grade I Heritage site which is said to be approximately 3 km away from the proposed waste management facility. A compliance statement for the archaeological and cultural theme will be included in the EIR.

8.7. Socio-economic

The site is in the jurisdiction of the City of Johannesburg, South Africa's largest metropolitan municipality in terms of population, size and economy. According to 2018 statistics the City of Johannesburg is home to approximately 5.5 million people, with an average household size of 3.1. The project area is situated in Region F of the city, with land use in the region varies from residential in the northwest, the west and the south, to industrial and manufacturing areas in the northeast. There are no residential units directly adjacent to the proposed site as the area is zoned for industrial activities, the nearest residential area is 0.5 km away in the inner city, characterised by low- to middle-income groups.

The abundant economic activity in the project area is related to low and middle industrial activities such as paper manufacturing, chemical manufacturing and waste management. Some retail activities are also situated in the area, such as autobody and repair shops, furniture warehouses, printing and embroidery services.

The unemployment in the city is currently at 26,5% and youth unemployment is estimated to be over 46,6%. Although over 65,5% of young people have completed matric only 9% have post matric.

qualifications consequently, the majority of youth due to their low skills are employed in the wholesale, retail & trade and private households.

8.8. Water Management

The facility will obtain its water supply from the existing municipal water infrastructure. The proposed recycling processes are primarily mechanical and are not expected to require significant quantities of fresh water. Water consumption will therefore be predominantly associated with domestic and sanitation requirements, including staff facilities.

A limited process-related water requirement will be associated with the pre-treatment of spent lithium-ion batteries (LIBs). The batteries will be immersed in a sodium chloride solution to discharge residual electrical energy prior to internal recycling processes.

The sodium chloride discharge solution will be managed through a contained closed-loop recovery and recirculation system and will be reused for subsequent battery-discharge batches where practicable. Consequently, the solution will not be replaced with an equivalent volume of fresh municipal water after each batch or on a daily basis. Fresh water will primarily be required for the initial preparation of the solution, make-up water to compensate for operational losses and evaporation, and periodic replacement or replenishment where the solution is no longer suitable for reuse. The actual fresh-water requirement will therefore be substantially lower than the gross working-solution volume and will be confirmed during detailed process design.

The spent sodium chloride discharge solution will be retained within the contained process system and, where replacement is required, will be appropriately stored pending collection and management by an authorised management service provider. No process wastewater or untreated spent discharge solution will be discharged to the municipal sewer, stormwater system or surrounding environment.

Domestic wastewater generated on site will be discharged to the municipal sewage system via the existing infrastructure.

8.9. Waste Management

The facility is a waste recycling facility and thus accepts hazardous e-waste for recycling and recovery of valuable materials. Therefore, only two types of waste streams are generated by the operations:

- Hazardous waste

During the manual dismantling of PCBs from the e-waste feedstock, non-valuable materials such as, low-metal substrates, plastics, ceramics, adhesives, and dust, will be segregated from recoverable materials. Although these materials have limited economic value, they may contain hazardous substances such as lead, cadmium, and brominated flame retardants. All non-recoverable waste will be segregated from valuable fractions, stored in closed and clearly labelled containers and sent to licensed hazardous waste facilities. While non-hazardous materials will be directed to approved recycling or disposal sites in accordance with local regulations. Appropriate personal protective equipment (PPE) will be used during handling to ensure worker safety.

Residual waste from grinding lithium-ion batteries to black mass and extracting metals will include unrecoverable black mass, separator and binder residues, graphite, and spent chemical solutions. Hazardous fractions containing heavy metals and residual electrolytes will be stored in closed, labelled containers and sent to licensed hazardous waste facilities, while non-hazardous materials will be directed to approved recycling or disposal sites. Appropriate PPE, dust control, and fume extraction will be used to ensure worker safety and environmental protection

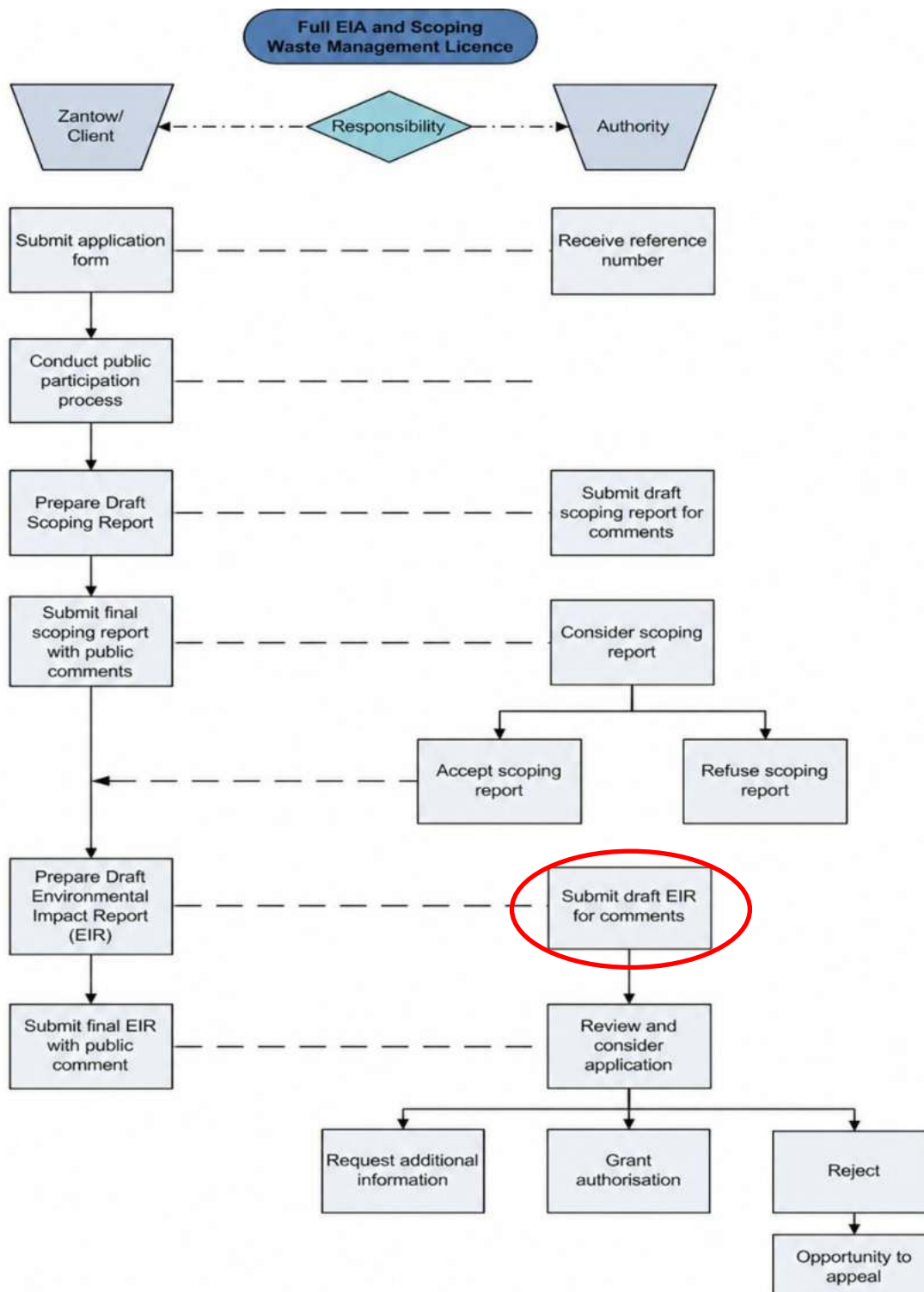
- General and domestic waste

General and domestic waste generated by the office and administrative sections of the facility is disposed of in allocated general waste bins and removed by a waste service provider at set frequencies.

8.10. Air quality management

Emissions from the site are not expected to be significant, as all processes will be undertaken within enclosed systems equipped with appropriate dust and fume extraction measures. The facility will install abatement equipment in the form of a dust and fume extraction system, fitted with a suction fan and a bottom hopper to enable efficient dust collection. The filtration system will be customised according to the types of fumes expected within the facility to ensure optimal extraction and effective emission control.

9. ACTIVITIES UNDERTAKEN AS PART OF THE EIA PROCESS



10. SPECIALIST STUDIES

This section summarises the specialist studies undertaken in support of the Environmental Impact Assessment process. The findings informed the impact assessment and Environmental Management Programme (EMPr).

10.1. Terrestrial and Aquatic Biodiversity, Plant and Animal Species Compliance Statement

Specialist: Excellence Ecology

The screening tool report indicated a high level of sensitivity for the Terrestrial Biodiversity Theme. As such, a Terrestrial and Aquatic Biodiversity, as well as Plant and Animal Species impact assessment has been undertaken in support of the EIA process.

The study assesses the potential sensitivities on the proposed site within the Terrestrial and Aquatic Biodiversity and Plant and Animal Species Themes.

Scope of work:

The scope of work for the Terrestrial and Aquatic Biodiversity, Plant and Animal Species Compliance Statement included a comprehensive assessment of the project area to identify and evaluate terrestrial and aquatic ecosystems, as well as associated flora and fauna. The Terrestrial and Aquatic Biodiversity, Plant and Animal Species Compliance Statement was informed by a combination of site-based observations and a review of relevant environmental legislation and biodiversity datasets. A site visit was conducted during the wet season in November 2025 (summer). The timing of the survey is not considered to have influenced the findings, as the project area is transformed and lacks natural vegetation. Information sources consulted included:

- Relevant spatial data and environmental information obtained through GIS mapping of the study area
- Applicable environmental legislation, including the National Environmental Management Act (NEMA) and the National Environmental Management: Biodiversity Act (NEMBA)
- The Vegetation of South Africa, Lesotho and Swaziland (2006) by Mucina and Rutherford
- Red Data species lists obtained from the South African National Biodiversity Institute
- Gauteng Conservation Plan V4 (C-Plan 4)
- Wetland-related datasets, including the National Freshwater Priority Areas and the National Wetland Map Version 6

Refer to **Annexure G-1** for a copy of the Terrestrial and Aquatic Biodiversity, Plant and Animal Species Compliance Statement.

10.2. Archaeological and Cultural Heritage Theme Compliance Statement

Specialist: Zantow Environmental Consultants

The screening tool report indicated a high level of sensitivity for the Archaeological and Cultural Heritage Theme. As such, an Archaeological and Cultural Heritage, compliance statement has been undertaken in support of the EIA process.

The study assesses the potential sensitivities on the proposed site within the Archaeological and Cultural Heritage theme.

Scope of work:

The Archaeological and Cultural Heritage assessment comprised a desktop study and site visit to determine the presence and sensitivity of heritage resources within the proposed development area. The desktop review included consultation of the South African Heritage Resources Information System, as well as relevant literature, historical maps, and aerial imagery.

A site visit conducted on 5 November 2025 included a visual inspection of the project footprint and surrounding area for any archaeological or cultural heritage features. The site is located within a previously disturbed industrial and commercially zoned area, and no heritage resources were identified.

The assessment, undertaken in accordance with the National Heritage Resources Act (NHRA), indicates that the site has low to negligible heritage sensitivity, and the proposed development is not expected to impact on archaeological or cultural heritage resources.

Refer to **Annexure G-2** for a copy of the Archaeological and Cultural Heritage assessment Compliance Statement.

10.3. Civil Aviation

Specialist: Zantow Environmental Consultants

The screening tool report indicated a high level of sensitivity for the Civil Aviation Theme. As such, a Civil Aviation, compliance statement has been undertaken in support of the EIA process.

The study assesses the potential sensitivities on the proposed site within the Civil Aviation theme.

Scope of work:

The Civil Aviation assessment comprised a desktop study and site visit to determine the presence and sensitivity of civil aviation resources within the proposed development area. The desktop review included consulting the RSA Airspaces in a 3D data KMZ file. The RSA Airspaces data is an initiative undertaken by the ATNS to illustrate the definitions and complexities of airspace, routes, aerodromes and navigational facilities within South Africa to the public in the interest of safety. By making use of this 3D modelled KMZ files, possible flight routes and aerodrome localities could be plotted.

A site visit conducted in November 2025 and again in March 2026, included a visual inspection of the project footprint and surrounding area for any civil aviation features. The existing site has been previously developed, and the current infrastructure has no impact on civil aviation activities. The proposed waste management activities will be conducted within the existing infrastructure, within an already disturbed industrial and commercially zoned area.

Based on the available aviation spatial information, site observations and proposed project design, no direct interference with an aerodrome, navigational facility, protected airspace or normal aircraft operation was identified. The project-specific civil aviation sensitivity is therefore considered low, notwithstanding the high relative sensitivity assigned by the Screening Tool.

Refer to **Annexure G-3** for a copy of the Civil Aviation assessment Compliance Statement.

11. PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT

A comprehensive impact assessment was conducted to assess the significance of the potential environmental impacts associated with the proposed e-waste management activities by Revive Africa. This methodology was also used to evaluate the alternatives to compare the proposed activities to those of the alternatives.

11.1. Assessment methodology

The assessment methodology that was utilised in determining the significance of the potential impacts of the planned activities, on the biophysical and socio-economic environment is explained in the following sections. The methodology is broadly consistent to that described in Integrated Environmental Management Series.

In order to assess the significance as objectively as possible, the criteria as per the 1998 Department of Environmental affairs and Tourism (DEAT) guidelines and the 2002 DEAT Information Series document was used as the basis for the assessment methodology adopted by Zantow Environmental Consulting Services.

The methodology applied to the assessment of the significance of potential impacts is based on the assessment criteria provided within the 1998 DEAT guidelines and the 2002 DEAT Information Series document (Impact significance, Integrated Environmental Management, Information Series 5). The methodology has been adapted to be more user friendly and applicable to the industrial processes and a description of the nature, extent, duration, intensity, probability of the impact.

The significance of the impacts is determined through a synthesis of these criteria, ranking them as follows;

Table 4: Risk classification

Significance Rating (SR)	Significance
350 - 600	Severe
200 - 349	High
131- 199	Medium
0 - 130	Low

For each impact identified, the Significance Rating (SR) is determined by various factors. Significance is described prior to mitigation as well as with the most effective mitigation measure(s) in place where so required.

The significant Rating is calculated as follows;

Risk (SR) = (Duration + Probability + Extent + Degree to which the impact may cause irreplaceable loss of resources) x Severity – (Mitigation + Degree to which the impact can be reversed)

The criteria are defined as follows;

- **Duration** – Refers to timeframe of the impact (how long will it last)
- **Probability** – Refers to the likeliness (chance) of the event occurring
- **Extent** – Refers to the scale of the impact in case the aspect results into impact (how far will the impact reach)
- **Severity** – Refers to the degree to which the impacts can change the environment
- **Degree** – Refers to which the impact may cause irreplaceable loss of resources
- **Indirect impacts** – Refers to impacts that do not result directly from the activity or operation but are influenced by the activity or operation
- **Mitigation** – Refers to a control that can be implemented to reduce the significance of an environmental impact

- **Degree to which the impact can be reversed** – Refers to the chance that the impact can be reversed by applying mitigation measures

A risk rating value is assigned accordingly as follows;

Table 5: Marks awarded for duration:

Duration	Guidelines	Value
Permanent	Permanent	8-10
Long term	As long as the facility is in operation	6-7
Medium term	5-10 years	4-5
Short term	0-4 years	1-3

Table 6: Marks awarded for probability

Probability	Guidelines	Value
Definite	where the impact will occur regardless of any prevention measures	9-10
Highly probable	impact is likely to occur 11 – 15 times per year where it is most likely that the impact will occur (>70% and <90% sure)	7-8
Probable	it is probable that the impact will occur 5 to 10 times per year where there is a distinct possibility that the impact will occur (>40% and < 70% sure);	4-6
Improbable	impact occurs very rarely (less than 5 times) throughout the year where the possibility of the impact to materialise is very low, either because of design or historic experience (<40% sure)	1-3
Imposable	No risk	0

Table 7: Marks awarded for degree to which the impact may cause irreplaceable loss of resources

Degree to which the impact may cause irreplaceable loss of resources	Guidelines	Value
International	Causes international impacts	10
National	Where the impact would have an impact on a national scale	8-9
Regional	Where the impact would extend to the region (municipal boundaries);	6-7
Local	Where the impact would be limited to the site and its immediate surroundings;	4-5
Immediate	extending only as far as the activity	1-3

Table 8: Marks awarded for awarded for extent

Extent	Guidelines	Value
Severe	Large scale loss of resources	5-7
Major	Loss of resources	3-4
Minor	No to minimal impact on resources	0-2

Table 9: Marks awarded for severity

Severity	Guidelines	Value
Highly significant	Causes irreparable damage	16-20
Severe	where natural or social functions or processes are altered to the extent that they will temporarily or permanently cease.	11-15
Major	where the affected environment is altered but natural and social functions and processes continue albeit in a modified way;	6-10
Minor	where the impact affects the environment in such a way that the natural and social functions and processes are affected in an insignificant manner. The impact is of low order and therefore likely to have little real effect	1-5

Table 10: Deductions awarded for each mitigation measure implemented

Mitigation	Guidelines	Value
Engineering controls	Engineering controls such as bund walls or lock out valves to control the activity	-10%
Administrative	Procedure or work instruction that guides or manage the activity	- 5%

Table 11: Calculated value to which an impact can be reversed

Degree to which the impact can be reversed	Guidelines	Value
High	The impact can be reversed easily by applying little effort	- 8%

Medium	The impact can be reversed by applying effective mitigation measures	- 6%
Low	The chance of revering the impact is low and is not likely. However, by applying extensive measures the impact can be reversed	- 4%
None	Cannot be reversed	- 0%

Any potential impact with a Risk Rating (SR) above “**medium risk**” must be assigned a mitigation measure to mitigate impact. In this case, most of the impacts have been determined as a low or medium impact, mitigation measures were however still assigned from a responsible corporate citizen and precautionary approach principal.

11.2. Potential environmental aspects and impacts associated with the proposed activities

The following environmental impacts associated with the proposed activities have been identified and will be further assessed during the impact assessment phase and mitigation measures will be developed to manage the impacts.

Table 12: Environmental Aspects

Environmental aspects associated with the proposed activities	Potential Environmental Impacts
Air quality and emissions	- Emissions from waste management processes - Indirect emissions from usage of electricity generation
Handling and storage of hazardous waste	- Environmental pollution (storm water pollution) - Potential risks to human health - Fire and thermal events from LIB processing
General waste management	- Environmental pollution and nuisance conditions - Loss of recyclable material
Resource consumption	Water and electricity usage
Occupational health and exposure	- Exposure to hazardous materials - Thermal events from LIB processing and handling
Socio economic benefits	- Creation of employment opportunities - Support local economic development

11.3. Proposed Mitigation measures to be applied

The following mitigation measures are proposed to manage the proposed e-waste management activities, to prevent and mitigate potential environmental impacts. The environmental aspects (activities) and potential impacts associated with the proposed activities are summarised in the Table below:

Table 13: Environmental Aspects and Proposed Mitigation Measures

Aspect	Proposed mitigation measures
Air quality	
Emissions from waste management procedures	- All operations are to be conducted in enclosed shredder systems - The operational area must be well ventilated and equipped with fume and dust extractors - Conduct regular inspections and maintenance of fume and dust extractors to ensure all systems are operating efficiently - All employees must be equipped with adequate PPE - Provide adequate training for personnel on e-waste management procedures

Aspect	Proposed mitigation measures
Storm water quality	
Storage and handling of hazardous substances	- All hazardous materials are to be stored in an area with impermeable surfaces - All hazardous materials are to be stored in clearly labelled containers that are of good integrity - Access to the hazardous materials must be restricted to trained personnel - A spill kit must be available to clean up spillages. The spill kit must be specific to the substances stored. - Employees must be trained on the appropriate use of spill kits and spill response procedures - Large spillages must be reported to management and handled according to the facility's incident management procedure
Waste management	
Storage of waste (input material)-LIBs	- LIBs must be stored in a dry and well-ventilated area, with no exposure to heat - Implement good housekeeping practices at the storage area
Storage of waste (input material)-PCBs	- PCBs must be stored at their designated storage area in accordance with their grading as per Revive Africa's grading processes - All components removed from the PCBs must be stored in designated storage containers that are correctly labelled - Implement good housekeeping practices at the storage area
Waste generated- non-recyclable material	- Waste must be stored in dedicated skips/bins and disposed at an appropriately Licensed landfill site or sent to duly authorised upstream/downstream service providers - General and hazardous waste must be managed separately - Use only credible and authorised waste contractors to transport and manage waste - Obtain safety disposal certificates for hazardous waste disposed - Burning of waste must be prohibited on site
Handling of General Waste	- The site must be kept clear of litter - Where possible general waste such as paper, cans and plastic must be separated and recycled - General waste must be kept in clearly labelled containers - General waste must not be mixed with hazardous waste - Employees must be trained on the handling of waste - General waste must be disposed at an appropriately Licensed disposal site - Records must be kept of the volumes of waste disposed
Handling of Hazardous Waste	- Hazardous waste generated on-site must be stored in an appropriately labelled container - Containers containing hazardous waste must be stored on an impermeable surface - Hazardous and general waste must not be mixed - Employees must be appropriately trained on the handling of hazardous waste - Hazardous waste must be removed from site and disposed by an appropriately Licensed contractor at an appropriately Licensed landfill site - Records must be kept of the volumes of waste disposed

Aspect	Proposed mitigation measures
Use of natural resource	
Wasteful use of resources like water and electricity leads to unnecessary impacts on national resources.	- No running taps to be left unattended - Switch off lights and air conditioners when not in use - Maintenance of water infrastructure to be conducted regularly
Occupational, Health and Safety	
Occupational exposure and safety risks	- Keep noise levels as low as possible - Provide Health and Safety Toolbox Talks - Maintain effective ventilation in the operational area - Appropriate PPE must be provided to all employees
Fire and thermal events-LIB handling and processing	- All LIB processing should be conducted in fully enclosed and inert systems to prevent thermal runaway - Adequate fire extinguishing equipment for LIB thermal events must be made available and maintained accordingly - All personnel must be trained on emergency response procedure and measures to take during thermal events
Socio-economic benefits	
Creation of employment opportunities	Employ local labourers as far as reasonably possible

The abovementioned mitigation measures are preliminary, and a comprehensive Environmental Management Programme (EMPr) is attached to **Annexure I**. The draft EMPr contains details of the aspects, impacts and proposed mitigation measures to manage the proposed activities. A copy of the EMPr will be included in the draft EIR for approval by the competent authority.

11.4. Residual impact ratings after mitigation measures have been applied

The proposed mitigation measures will reduce the significance of the potential environmental impacts associated with the activities. Therefore, the residual risk will be lower after mitigation measures have been applied.

11.5. Environmental Aspects and Impacts – Proposed Alternative

The EIA indicates that the environmental impacts associated with the construction phase of the proposed project are generally of low significance, with the socio-economic impacts assessed as having a low positive significance due to the temporary employment opportunities that will be created during construction.

The operational phase is associated with impacts ranging from low to high significance prior to the implementation of mitigation measures. Following the implementation of the proposed mitigation measures, the significance of the adverse impacts is reduced, with the residual impacts ranging from low to medium significance. The operational phase is also expected to result in medium positive socio-economic impacts, primarily due to the creation of permanent employment opportunities. In addition, the recycling activities associated with the project are expected to have a high positive impact, as the recycling of e-waste and lithium-ion batteries (LIBs) will facilitate the recovery of valuable materials, divert waste from disposal and contribute to the principles of resource recovery and the circular economy.

The decommissioning phase is characterised by impacts ranging from low to high significance, both before and after the implementation of mitigation measures. While the proposed closure and decommissioning measures will reduce and manage several potential impacts, certain impacts associated with the closure of the facility remain of high significance due to the potential environmental implications associated with site closure and the cessation of operations. The environmental aspects

(activities) and potential impacts associated with the construction, operational, and decommissioning phases of the proposed project are summarised in the Tables 14-16 below:

Table 14: Environmental aspects and impacts – construction phase

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
Air quality	Vehicle exhaust emissions - air pollution	Low	Vehicles must not idle while not in use.	Low
Stormwater and soil contamination	Impacts on storm water due to hydrocarbon spills from parked vehicles	Low	Undertake vehicle inspections to check for potential leakages Vehicles owned and managed by Revive Africa must be maintained to prevent hydrocarbon leaks. Spillages must be cleaned appropriately using available spill response equipment. Employees must be trained on the appropriate use of spill kits and spill response procedures.	Low
	Storage and use of hazardous substances including paint, grease, cleaning agents	Low	All hazardous substances must be stored in dedicated areas equipped with impermeable flooring and covered. Good housekeeping must be applied. Spillages must be cleaned appropriately using available spill response equipment	Low
Waste management	Poor waste management - windblown litter leading to nuisance conditions.	Low	Store construction waste in a designated area where applicable. Appropriate skips must be provided to store waste. Ensure that waste is removed and disposed at a licensed waste disposal site or suitable licensed recyclers. Hazardous and general waste must be managed separately. Use only duly authorised waste contractors to transport and manage waste. Obtain safe disposal certificates for hazardous waste removed from site for disposal	Low

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
			The burning of waste must be prohibited	
	Stockpiling of waste streams on site leading to nuisance conditions and potential impacts on storm water and ground water resources		All waste streams must be stored within designated areas. Ensure waste is removed from site at regular intervals as to limit the stockpiling of waste on site.	
Natural resource management	Wasteful use of resources like water and electricity leads to unnecessary impacts on the national resources.	Low	No running taps to be left unattended. Switch off lights and air conditioners when not in use.	Low
Noise generation	Noise impact on adjacent businesses, landowners and employees	Low	Ensure noise levels are compliant to the limits specified in the Occupational Health and Safety Act. Ensure noise generating activities are limited to operational hours between 6 am and 6 pm.	Low
Socio-economic	Temporary employment opportunities	Low positive		

Table 15: Environmental aspects and impacts - operational phase

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
Air Quality Impacts	Fugitive dust emissions- handling, dismantling, grinding, shredding, and milling of PCBs	Medium	All operations are to be conducted in enclosed shredder systems The operational area must be well ventilated and equipped with fume and dust extractors Ensure regular maintenance of fume and dust extractors is conducted regularly to ensure all systems are operating efficiently Undertake monthly cleaning and maintenance of equipment to ensure efficient operation including replacement, as necessary Ensure all personnel is equipped with adequate personal protective equipment (PPE) that is worn at all times The facility must have signages indicating the required PPE for the specific working area	Low
	Vehicle exhaust emissions - Loading and off-loading of material	Low	Vehicles must not idle while not in use.	Low
	Volatile emissions-Gases from LIB shredding processes	Medium	All LIB processing should be conducted in fully enclosed and inert systems to prevent thermal runaway The operational area shall be well ventilated for personnel safety and equipped with explosion-rated fume and dust extraction systems designed for use with inert process equipment. Ensure maintenance of fume and dust extracting systems is conducted regularly	Low

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
			Ensure all personnel is equipped with the correct PPE that is worn at all times Have signages indicating correct PPE for working area Provide adequate training for personnel on LIB recycling to reduce the release of volatile emissions	
Stormwater and soil contamination	Leachate of hazardous substances- During handling, dismantling and milling of PCBs	Medium	Ensure all PCB waste management procedures are done in the building with impermeable surfaces to prevent leachate of material to environment. All hazardous components removed from e-waste to be stored in containers and clearly labelled to indicate the contents. All waste storage containers must be in good integrity. Good housekeeping must be implemented to prevent the release of shredded or milled PCBs.	Low
	Leachate of hazardous substances- During handling and shredding of LIBs	High	Ensure all waste management processes are done in the building with impermeable surfaces to prevent leachate of material to environment. Regular inspections of LIBs for leakages must be conducted to prevent exposure to the environment The black mass and other by-products from the shredding process must be stored in containers and clearly labelled to indicate the contents. All waste storage containers must be in good integrity to prevent leakage of hazardous materials to the environment. In the event of any spillage of black mass or other by-products they must be swept up immediately using the appropriate spill kit to prevent leachate to the environment.	Medium

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
			A spill kit must be readily available, and employees must be appropriately trained on how it is to be used. The stormwater management plan must be implemented accordingly.	
	Generation of spent sodium solution- LIB Discharge	Medium	Reuse the salt solution where practicable and replace only when operational limits are reached. Store fresh and spent solution in bunded, impermeable containment areas and prevent contact with stormwater. Implement spill prevention measures, maintain spill response equipment and train personnel in emergency procedures. Ensure spent solution is collected by duly authorized waste management service providers for disposal, maintain disposal certificates. Classify and characterize spend sodium solution to ensure environmentally sound management.	Low
	Oil leaks/Spillages of hazardous materials	Low	All spills must be captured and reported as incidents using Revive Africa's internal incident reporting procedure. Employees must be appropriately trained to handle spills. A spill kit must be readily available. Absorbent material used to clean spills must be treated as hazardous waste and stored appropriately.	Low
Waste management	Feedstock storage and handling- LIBs	Low	LIBs to be stored at their designated storage area that is dry and well-ventilated area with no exposure to heat. Implement good housekeeping practices at the storage area.	Low

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
	Feedstock storage and handling- PCBs	Low	PCBs must be stored at their designated storage area in accordance with their grading as per Revive Africa's grading processes. All components removed from the PCBs must be stored in designated storage containers that are correctly labelled.	Low
	Incorrect handling of waste leading to the mixing of hazardous and general waste streams	Medium	Waste must be stored in terms of the National Norms and Standards for the Storage of Waste. Waste bins or storage areas must be clearly labelled to indicate the waste stream to be stored or disposed of in the container or area. Personnel must be trained on the appropriate disposal and handling of all waste streams generated and stored on site.	Low
	Waste generated from internal recycling processes- non-recyclable material	Medium	All components that will not be further processed internally must be stored in dedicated skips/bins and disposed at an appropriately Licensed landfill site or sent to duly authorised upstream/downstream service providers for further processing. Obtain safety disposal certificates for all hazardous waste leaving the facility for further processing. Burning of waste must be prohibited on site.	Low

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
	Handling of general waste	Low	The site must be kept clear of litter to prevent nuisance conditions. Where possible general waste such as paper, cans and plastic must be separated and recycled. General waste must be kept in clearly labelled containers. General Waste must not be mixed with Hazardous waste. Employees must be trained on the handling of waste, including its separation at source. General waste must be disposed at an appropriately Licensed disposal site. Records must be kept of the volumes of waste disposed.	Low
	Handling of hazardous waste	Medium	Hazardous waste generated on-site must be stored in an appropriately labelled container. Containers containing hazardous waste must be stored on an impermeable surface. Hazardous and general waste must not be mixed. Employees must be appropriately trained on the handling of Hazardous waste. Hazardous waste must be removed from site and disposed by an appropriately Licensed contractor at an appropriately Licensed landfill site. Records must be kept of the volumes of waste disposed.	Medium

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
Natural resource management	Wasteful use of resources like water and electricity leads to unnecessary impacts on the national resources.	Low	No running taps to be left unattended. Repair water leaks immediately. Switch off lights and air conditioners when not in use.	Low
Health and Safety of Personnel	Occupational exposure to noise and residue in the operational areas	Medium	Keep noise levels as low as possible. Provide Health and Safety Toolbox Talks as a basis for training to employees. Maintain effective ventilation in the operational area. Appropriate PPE must be provided to all employees and worn at all times. Signages of the required PPE for all operational areas must be inserted.	Low
	Fire and thermal events-LIB handling and processing	High	Ensure LIB recycling processes are conducted in a controlled environment. Ensure fire response equipment is provided and all employees duly trained on how to handle thermal runaway from LIB processing. Appropriate PPE must be provided to all employees.	Medium
Socio-economic	Permanent employment opportunities	Medium Positive Impact		
Waste Recycling	Recycling of e-waste and recovery of valuable material	High Positive Impact		

Table 16: Environmental aspects and impacts - decommissioning phase

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
Emissions to the atmosphere	Vehicle exhaust emissions - air pollution	Low	All vehicles to be maintained in good working order to keep their atmospheric emissions under control Prohibit idling of vehicles when not in use	Low
Storm water discharge	Hydrocarbon spillages from decommissioning vehicles and equipment - storm water and soil pollution	Low	Spill kits must be available Employees must be trained on the correct use of spill kits	Low
Waste management	Storage and handling of general waste and building rubble - windblown litter leading to nuisance conditions	Low	Store general waste in a designated area, designed to prevent windblown litter. Appropriate skips must be provided to store waste All skips or containers must be labelled Maintain an inventory of waste generated and keep records of how it was managed during the construction phase. Prevent nuisance conditions and overfilling of skips and include the inspections thereof in the ECO inspections Ensure that waste is removed and disposed at a licensed general waste disposal site or suitable licensed recyclers. Use only credible and authorised waste contractors to transport and manage waste. Ensure that uncontaminated builder's rubble that is classified as inert is managed correctly. Building rubble contaminated with oil, fuel or lubricants or any other contaminating material or liquid must be disposed at a licensed landfill site. Burning of waste must be prohibited.	Low
Socio-economic	Loss of employment opportunities due to closure of the site	High	Engagement with employees in advance Redirect employees to other operational units where possible	High

11.6. Environmental Aspects and Impacts – Alternative 1

The EIA indicates that the environmental impacts associated with the construction phase of Alternative 1 are generally of low significance, both before and after the implementation of mitigation measures. Certain socio-economic impacts are assessed as having a low positive significance, primarily due to the temporary employment opportunities that will be created during the construction phase.

The assessment further identified high-significance negative socio-economic impacts associated with the alternative technologies. These impacts are primarily related to the substantial financial investment required to implement the technologies, including the procurement, installation and commissioning of specialised equipment and infrastructure, as well as the level of technology readiness required to support their implementation. These impacts are considered largely unavoidable and cannot be effectively mitigated, as the capital expenditure and associated investment required to procure and establish the necessary technology and infrastructure are inherent to the implementation of the alternative technologies.

The environmental impacts associated with the operational phase range from low to high significance prior to the implementation of mitigation measures. Following the implementation of the proposed mitigation measures, the significance of the adverse environmental impacts is reduced, with the residual impacts ranging from low to medium significance. The operational phase is also expected to result in both positive and negative socio-economic impacts. The positive socio-economic impacts are primarily associated with the creation of permanent employment opportunities; however, these are expected to be of low positive significance due to the highly automated nature of the proposed systems and the consequently limited requirement for manual labour.

The assessment also identified high-significance negative socio-economic impacts associated with the long-term operational costs of the alternative automated systems. These systems would require ongoing optimisation and potentially specialised modifications to accommodate different battery chemistries and evolving LIB technologies. As battery chemistries continue to be developed and optimised to improve efficiency, performance and energy density, the technologies and associated automated systems may require periodic upgrades or adaptation to remain compatible with changing battery types. This may result in increased operational expenditure and technological obsolescence risks over the long term.

In addition, the recycling activities associated with the project are expected to have a high positive impact, as the recycling of e-waste and lithium-ion batteries (LIBs) will facilitate the recovery of valuable materials, divert waste from disposal and contribute to resource recovery and the principles of the circular economy.

The decommissioning phase is characterised by impacts ranging from low to high significance, both before and after the implementation of mitigation measures. While the proposed closure and decommissioning measures will reduce and manage several potential impacts, certain impacts associated with the closure of the facility remain of high significance, primarily due to the potential environmental implications associated with the cessation of operations, removal of infrastructure and equipment, and management of residual materials and wastes.

The environmental aspects (activities) and potential impacts associated with the construction, operational and decommissioning phases of the proposed project are summarised in Tables 17-19, respectively:

Table 17: Environmental Aspects and Impacts Construction Phase– Alternative 1

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
Air quality	Vehicle exhaust emissions - air pollution	Low	Vehicles must not idle while not in use.	Low
Stormwater and soil contamination	Impacts on storm water due to hydrocarbon spills from parked vehicles	Low	Undertake vehicle inspections to check for potential leakages Vehicles owned and managed by Revive Africa must be maintained to prevent hydrocarbon leaks. Spillages must be cleaned appropriately using available spill response equipment. Employees must be trained on the appropriate use of spill kits and spill response procedures.	Low
	Storage and use of hazardous substances including paint, grease, cleaning agents	Low	All hazardous substances must be stored in dedicated areas equipped with impermeable flooring and covered. Good housekeeping must be applied. Spillages must be cleaned appropriately using available spill response equipment	Low
Inefficient use of resources	Infrastructure Installation- use of steel, copper cables and control systems for automated equipment	Low	Optimise the design to minimise the quantities of steel, copper, concrete, and cabling required. Ensure systems are installed by duly qualified personnel.	Low
Waste management	Poor waste management - windblown litter leading to nuisance conditions and burning of waste.	Low	Store construction waste in a designated area where applicable. Appropriate skips must be provided to store waste. Ensure that waste is removed and disposed at a licensed waste disposal site or suitable licensed recyclers.	Low

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
			Hazardous and general waste must be managed separately. Use only duly authorised waste contractors to transport and manage waste. Obtain safe disposal certificates for hazardous waste removed from site for disposal The burning of waste must be prohibited	
	Stockpiling of waste streams on site leading to nuisance conditions and potential impacts on storm water and ground water resources		All waste streams must be stored within designated areas. Ensure waste is removed from site at regular intervals as to limit the stockpiling of waste on site.	
Natural resource management	Wasteful use of resources like water and electricity leads to unnecessary impacts on the national resources.	Low	No running taps to be left unattended. Switch off lights and air conditioners when not in use.	Low
Noise generation	Noise impact on adjacent businesses, landowners and employees	Low	Ensure noise levels are compliant to the limits specified in the Occupational Health and Safety Act. Ensure noise generating activities are limited to operational hours between 6 am and 6 pm.	Low
Socio-economic	Technology adoption- Financial Investment and technology readiness	High-Negative		
	Temporary employment opportunities	Low positive		

Table 18: Environmental Aspects and Impacts Operational Phase– Alternative 1

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
Air quality impacts	Fugitive dust emissions- handling, dismantling, grinding, shredding of PCBs	Medium	All operations are to be conducted in enclosed shredder systems. The operational area must be well ventilated and equipped with fume and dust extractors. Ensure regular maintenance of fume and dust extractors is conducted regularly to ensure all systems are operating efficiently. Undertake monthly cleaning and maintenance of equipment to ensure efficient operation including replacement, as necessary. Ensure all personnel is equipped with adequate personal protective equipment (PPE) that is worn at all times. The facility must have signages indicating the required PPE for the specific working area.	Low
	Vehicle exhaust emissions - Loading and off-loading of material	Low	Vehicles must not idle while not in use.	Low
	Volatile emissions-Gases from LIB shredding processes	Medium	All LIB processing should be conducted in fully enclosed and inert systems to prevent thermal runaway The operational area shall be well ventilated for personnel safety and equipped with explosion-rated fume and dust extraction	Low

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
			systems designed for use with inert process equipment. Ensure maintenance of fume and dust extracting systems is conducted regularly Ensure all personnel is equipped with the correct PPE that is worn at all times Have signages indicating correct PPE for working area Provide adequate training for personnel on LIB recycling to reduce the release of volatile emissions	
Energy Consumption	Higher electricity demand- use of robotics, IoT, machine vision and automated equipment	High	Install smart energy management systems to monitor, record, and optimise electricity use in real time.	Medium
	Indirect greenhouse gas emissions from electricity consumption	High	Implement an Energy Management Plan and monitor electricity consumption against production output. Ensure machinery and equipment are duly maintained according to manufacturer's specifications or annually for efficient operations. Train operators on energy-efficient operating practices. Develop and implement an Energy Efficiency and Greenhouse Gas Reduction Plan	Medium

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
	Energy recovery-Resistor discharge	High-Positive		
Stormwater and soil contamination	Leachate of hazardous substances- During handling, dismantling of PCBs	Medium	Ensure all PCB waste management procedures are done in the building with impermeable surfaces to prevent leachate of material to environment. All hazardous components removed from e-waste to be stored in containers and clearly labelled to indicate the contents. All waste storage containers must be in good integrity. Good housekeeping must be implemented to prevent the release of shredded or milled PCBs.	Low
	Chemical spills and contaminated wastewater from LIB mechano-chemical separation	High	All LIB recycling must be conducted inside the operational area on an impermeable surface. Employees must be properly trained on the correct handling of LIBs. Wastewater must be managed in an environmentally sustainable manner by duly authorised service providers. Effluent from recycling process must not be discharged to municipal infrastructure prior treatment, once treated permission must be obtained from municipality prior discharge.	Medium
	Oil leaks/Spillages of hazardous materials	Low	All spills must be captured and reported as incidents using Revive Africa's internal incident reporting procedure. Employees must be appropriately trained to handle spills. A spill kit must be readily available.	Low

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
			Absorbent material used to clean spills must be treated as hazardous waste and stored appropriately	
Waste management	Feedstock storage and handling- LIBs	Low	LIBs to be stored at their designated storage area that is dry and well-ventilated area with no exposure to heat. Implement good housekeeping practices at the storage area	Low
	Feedstock storage and handling- PCBs	Low	PCBs must be stored at their designated storage area in accordance with their grading as per Revive Africa's grading processes All components removed from the PCBs must be stored in designated storage containers that are correctly labelled	Low
	Waste generated from internal recycling processes- non-recyclable material	Medium	All components that will not be further processed internally must be stored in dedicated skips/bins and disposed at an appropriately Licensed landfill site or sent to duly authorised upstream/downstream service providers for further processing. Obtain safety disposal certificates for all hazardous waste leaving the facility for further processing. Burning of waste must be prohibited on site.	Low

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
	Handling of general waste	Low	The site must be kept clear of litter to prevent nuisance conditions. Where possible general waste such as paper, cans and plastic must be separated and recycled. General waste must be kept in clearly labelled containers. General Waste must not be mixed with Hazardous waste. Employees must be trained on the handling of waste, including its separation at source. General waste must be disposed at an appropriately Licensed disposal site. Records must be kept of the volumes of waste disposed.	Low

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
	Handling of hazardous waste	Medium	Hazardous waste generated on-site must be stored in an appropriately labelled container. Containers containing hazardous waste must be stored on an impermeable surface. Hazardous and general waste must not be mixed. Employees must be appropriately trained on the handling of Hazardous waste. Hazardous waste must be removed from site and disposed by an appropriately Licensed contractor at an appropriately Licensed landfill site. Records must be kept of the volumes of waste disposed.	Low
Natural resource management	Wasteful use of resources like water and electricity leads to unnecessary impacts on the national resources.	Low	No running taps to be left unattended. Repair water leaks immediately. Switch off lights and air conditioners when not in use.	Low
Health and Safety Personnel	Occupational exposure to noise and residue in the operational areas	Medium	Keep noise levels as low as possible. Provide Health and Safety Toolbox Talks as a basis for training to employees. Maintain effective ventilation in the operational area. Appropriate PPE must be provided to all employees and worn at all times	Low

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
			Signages of the required PPE for all operational areas must be inserted.	
	Fire and thermal events- Electrical faults or LIB handling and processing	High	Ensure LIB recycling processes are conducted in a controlled environment. Conduct maintenance of equipment according to manufacture specifications or annually. Install fire detection systems and ensure fire response equipment is provided and all employees duly trained on how to handle thermal runaway from LIB processing. Appropriate PPE must be provided to all employees. The fire risk and emergency-response assessment must be implemented accordingly. Damaged/defective batteries must be quarantined, and the waste management plan implemented accordingly.	Medium
	Exposure to robotic equipment and moving machinery	Medium	Assign designated walkways for personnel and install physical barriers, perimeter fencing, and machine guarding around all robotic cells and moving machinery to prevent unauthorised access. Provide Health and Safety Toolbox Talks	Low

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
			Provide adequate training for all machinery operators and restrict access to robotic work areas to authorised and trained personnel only. Appropriate PPE must be provided to all employees. Develop and implement Safe Operating Procedures (SOPs) for operating, cleaning, and maintaining automated equipment.	
	Exposure to chemicals- LIB mechano-chemical separation	Medium	Install emergency eyewash stations and safety showers in areas where chemicals are stored or handled. Ensure all personnel receive training on chemical hazards, battery hazards, spill response, and emergency procedures. Restrict access to chemical handling areas to authorised and trained personnel only Conduct mechanical separation and any chemical treatment in enclosed or closed-process systems to minimise exposure. Appropriate PPE must be provided to all employees. Implement an occupational health surveillance programme for employees who may be routinely exposed to battery materials or hazardous chemicals.	Low

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
Waste Recycling	Recycling of e-waste and recovery of valuable material		High- Positive Impact	
Socio-economic	Permanent employment opportunities		Low- Positive Impact	
	Long term operational cost- Optimisation of LIB dismantling technology for different LIB battery chemistries		High-Negative	

Table 19: Environmental aspects and impacts - decommissioning phase- Alternative 1

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
Emissions to the atmosphere	Vehicle exhaust emissions - air pollution	Low	All vehicles to be maintained in good working order to keep their atmospheric emissions under control	Low
			Prohibit idling of vehicles when not in use	
Storm water contamination	Hydrocarbon spillages from decommissioning vehicles and equipment - storm water and soil pollution	Low	Spill kits must be available Employees must be trained on the correct use of spill kits	Low
	Chemical spillages- Removal of infrastructure associated with mechano-chemical separation	Medium	Ensure decommissioning is conducted by duly trained personnel Spill kits must be available and train employees to implement spill kits	Low
Waste management	Storage and handling of general waste and building rubble - windblown litter leading to nuisance conditions	Low	Store general waste in a designated area, designed to prevent windblown litter.	Low
			Appropriate skips must be provided to store waste	
			All skips or containers must be labelled	
			Maintain an inventory of waste generated and keep records of how it was managed during the construction phase.	
			Prevent nuisance conditions and overfilling of skips and include the inspections thereof in the ECO inspections	
			Ensure that waste is removed and disposed at a licensed general waste disposal site or suitable licensed recyclers.	
			Use only credible and authorised waste contractors to transport and manage waste.	
			Ensure that uncontaminated builder's rubble that is classified as inert is managed correctly.	
Socio-economic	Loss of employment opportunities due to closure of the site	High	Building rubble contaminated with oil, fuel or lubricants or any other contaminating material or liquid must be disposed at a licensed landfill site.	High
			Burning of waste must be prohibited.	
			Engagement with employees in advance	
			Redirect employees to other operational units where possible	

11.7. Environmental aspects and impacts: No-go

The EIA revealed that the environmental impacts associated with the no-go alternative will be of a high significance prior to the application of mitigation. The application of the mitigation measures will lower the significance ratings, and the impacts will be medium significance after mitigation measures have been applied. The no-go option is based on long term operation and impacts associated with continued site use in its current state, should no upgrades or additional waste management activities be undertaken.

Table 20: Environmental aspects and impacts: no-go option

Environmental impact category (nature)	Description of environmental aspect	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
Economic impacts	Loss of revenue due to lack of adequate storage and production capacity	High	Investigate alternative methods to contribute to local economy.	Medium
	Loss of employment opportunities.	High	Investigate alternative methods to contribute to local economy.	Medium

11.8. Cumulative environmental impacts

The cumulative environmental impacts identified relate to the potential release of volatile organic compounds (VOCs) and dust emissions, as well as the improper handling of hazardous waste materials. Uncontrolled exposure to such emissions may result in short-term health effects, including respiratory or sensory irritation. However, the installation of air-emission abatement equipment will minimise the release of VOCs and particulate matter, thereby limiting both environmental and human health risks. Furthermore, the provision of appropriate personal protective equipment (PPE) to personnel will further reduce occupational health risks. In addition, the implementation of suitable mitigation measures for the management of hazardous waste will reduce the potential environmental and occupational health hazards associated with the activity.

Table 21: Summary of cumulative impacts

Environmental impact category	Description of environmental aspect (nature)	Risk Rating Before Mitigation	Mitigation Measures	Risk Rating After Mitigation
Air quality	Fugitive dust and VOC emissions	Medium	All operations are to be conducted in enclosed shredder systems The PCB operational area must be well ventilated and equipped with fume and dust extractors Conduct regular inspections and maintenance of fume and dust extractors to ensure all systems are operating efficiently All employees must be equipped with adequate PPE All LIB processing should be conducted in fully enclosed and inert systems to prevent thermal runaway	Low
Waste management	Hazardous waste is received, recovered and recycled by Revive Africa. Improper handling, storage, recovery, recycling and treatment can lead to unacceptable impacts	High	Develop procedures for handling of hazardous waste material, which includes safe work procedures to safely store, handle, sort and process different waste streams, Implement adequate engineering controls such as appropriate machinery, providing correct tools for dismantling of e-waste	Medium

Safety, Health and Safety	Long term exposure to VOC and fugitive dust emissions	Medium	Provide Health and Safety Toolbox Talks as a basis for training to employees. Maintain effective ventilation in the operational area. Appropriate PPE must be provided to all employees and worn at all times Signages of the required PPE for all operational areas must be inserted	Low
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11.9. Proposed Mitigation Measures to be Applied

The following mitigation measures are proposed to manage the proposed waste management activities at the site in order to prevent and mitigate potential environmental impacts. Refer to **Annexure I** for the EMPr.

• Construction Phase

The following Table contains a summary of the proposed mitigation measures to prevent or mitigate potential impacts associated with the construction activities

Table 22: Mitigation measures - construction phase

Aspect	Proposed mitigation measures
Air quality	
Vehicle and machinery emissions	Prohibit idling of vehicles when not in use.
Storm water	
Oil spillages	- Undertake vehicle inspections of all vehicles entering the premises for leakages - All vehicles managed by Revive Africa must be maintained regularly to prevent oil leakages.
Storage and handling of hazardous substances	- All potentially hazardous substances are to be stored on paved surfaces. - Spill kits must be available. - Employees must be trained on the appropriate use of spill kits and spill response procedure
Waste	
Generation and management of waste.	- Store construction waste in a designated area - Appropriate skips or waste containers must be provided for waste storage - Ensure that waste is removed and disposed at a licensed waste disposal site or suitable licensed recyclers. - Hazardous and general waste must be managed separately - Use only credible and authorised waste contractors to transport and manage waste. - Obtain safe disposal certificates for hazardous waste removed from site for disposal. - Burning of waste must be prohibited on site.
Use of natural resource	
Wasteful use of resources like water and electricity leads to unnecessary impacts on national resources.	- No running taps to be left unattended. - Repair water leaks immediately. - Switch off lights and air conditioners when not in use.
Safety	
- Noise Pollution - Occupational exposure	- Keep noise levels as low as possible. - Restrict noise generating activities to 6 am and 6 pm - Adequate PPE must be provided to all employees - Employees to be inducted on health and safety measures

• Operational phase

The following Table contains a summary of the proposed mitigation measures to prevent or mitigate potential impacts associated with the operational activities

Table 23: Mitigation measure - operational phase

Aspect	Proposed mitigation measures
Air quality	
Emissions from waste management procedures	- All operations are to be conducted in enclosed shredder systems - The operational area must be well ventilated and equipped with fume and dust extractors - Conduct regular inspections and maintenance of fume and dust extractors to ensure all systems are operating efficiently - All employees must be equipped with adequate PPE

Aspect	Proposed mitigation measures
	Provide adequate training for personnel on e-waste management procedures
Storm water quality	
Storage and handling of hazardous substances	- All waste management procedures to be undertaken in an area with impermeable surfaces - All waste materials to be stored in clearly labelled containers that are of good integrity - A spill kit must be available to clean up spillages. The spill kit must be specific to the substances stored. - Employees must be trained on the appropriate use of spill kits and spill response procedures - Large spillages must be reported to management and handled according to the facility's incident management procedure
Waste management	
Storage of waste (input material)-LIBs	- LIBs must be stored in a dry and well-ventilated area, with no exposure to heat - Implement good housekeeping practices at the storage area
Storage of waste (input material)-PCBs	- PCBs must be stored at their designated storage area in accordance with their grading as per Revive Africa's grading processes - All components removed from the PCBs must be stored in designated storage containers that are correctly labelled - Implement good housekeeping practices at the storage area
Waste generated- non-recyclable material	- Waste must be stored in dedicated skips/bins and disposed at an appropriately Licensed landfill site or sent to duly authorised upstream/downstream service providers - General and hazardous waste must be managed separately - Use only credible and authorised waste contractors to transport and manage waste - Obtain safety disposal certificates for hazardous waste disposed - Burning of waste must be prohibited on site
Handling of General Waste	- The site must be kept clear of litter - Where possible general waste such as paper, cans and plastic must be separated and recycled - General waste must be kept in clearly labelled containers - General waste must not be mixed with hazardous waste - Employees must be trained on the handling of waste - General waste must be disposed at an appropriately Licensed disposal site - Records must be kept of the volumes of waste disposed
Handling of Hazardous Waste	- Hazardous waste generated on-site must be stored in an appropriately labelled container - Containers containing hazardous waste must be stored on an impermeable surface - Hazardous and general waste must not be mixed - Employees must be appropriately trained on the handling of hazardous waste - Hazardous waste must be removed from site and disposed by an appropriately Licensed contractor at an appropriately Licensed landfill site - Records must be kept of the volumes of waste disposed
Use of natural resource	
Wasteful use of resources like water and electricity leads to unnecessary impacts on national resources.	- No running taps to be left unattended - Switch off lights and air conditioners when not in use - Maintenance of water infrastructure to be conducted regularly
Occupational, Health and Safety	
Occupational exposure and safety risks	- Keep noise levels as low as possible - Provide Health and Safety Toolbox Talks - Maintain effective ventilation in the operational area - Appropriate PPE must be provided to all employees

Aspect	Proposed mitigation measures
Fire and thermal events-LIB handling and processing	- All LIB processing should be conducted in fully enclosed and inert systems to prevent thermal runaway - Adequate fire extinguishing equipment for LIB thermal events must be made available and maintained accordingly - All personnel must be trained on emergency response procedure and measures to take during thermal events

• Decommissioning phase

The following Table contains a summary of the proposed mitigation measures to prevent or mitigate potential impacts associated with the decommissioning activities

Table 24: Mitigation measure - decommissioning phase

Aspect	Proposed mitigation measures
Air quality	
Vehicle and machine exhaust emissions - air pollution	- All vehicles to be maintained in good working order to keep their atmospheric emissions under control. - Prohibit idling of vehicles when not in use
Storm water	
Hydrocarbon spillages from vehicles - storm water and soil pollution	- All vehicles to be maintained in good working order to prevent hydrocarbon leakages - Spill kits must be available. - Employees must be trained on the appropriate use of spill kits and spill response procedures. - Adequate maintenance of equipment to prevent spills.
Waste	
Generation and management of waste	- Store general and hazardous waste separately in their designated storage areas, designed to prevent windblown litter - Appropriate skips or waste containers that are clearly labelled must be provided to store waste - Maintain an inventory of waste generated and records keep records of how it was managed during the construction phase - Prevent nuisance conditions and overfilling of skips and include the inspections thereof in the weekly ECO inspections - Ensure that all waste removed is disposed or recycled by duly authorised service providers - Burning of waste must be prohibited
Socio-economic	
Loss of employment opportunities when site closes	- Detailed closure planning in consultation with employees prior to closure - Redirect employees to other operational units where possible

The EMPr contains details of the aspects and proposed mitigation measures to manage the proposed activities.

11.10. EAP's opinion regarding the proposed waste management facility by Revive Africa and measures that should be included in the waste management license.

The proposed waste management activities by Revive Africa's operations will provide an improved process for the recycling and recovery of valuable material from e-waste. The modification of the waste management activities will enable Revive Africa to increase the facility's waste recovery and recycling capacity. The waste management activities of the existing operation directly contributes to waste reduction which would in turn reduce pressures on the already stressed waste industry and landfill sites.

The recycling of e-waste by Revive Africa is in line with the waste hierarchical approach prescribed by the NWMS and South Africa's transition towards a circular economy. The waste hierarchical approach has been designed to promote effective waste management practices to avoid the disposal of waste and associated environmental consequences. Revive Africa's operations are already situated in an

existing industrial area, with the existing site already developed. The planned waste management activities will therefore not result in further disturbance of virgin land or require the removal of vegetation or disturbance of an established community area. The proposed waste management activities can be facilitated within an already approved footprint with minimal impacts on surrounding operations and communities.

From an environmental point of view, the proposed waste management activities are preferred compared to the alternative which would consist of the current operations continuing in its current state. The project can proceed only if the proponent commits to the effective implementation of the proposed mitigation measures contained in the EMPr. The following mitigation measures should be included in the EA:

- Maintenance of abatement equipment according to manufacturer's specifications.
- Maintenance of processing equipment according to maintenance schedule/job card system.
- Implement complaints management procedures.
- Implement the requirements of the National Norms and Standards for the Storage of Waste and the Norms and Standards for Sorting, Shredding, Grinding, Crushing, Screening or Baling of General Waste.
- The conditions of the EMPr must be implemented to prevent or mitigate potential environmental impacts.
- Measures must be implemented to prevent and clean up spillages on-site.

11.11. Assumptions and limitations

The EIA was done at a specific time period in terms of the current understanding of the proposed development and operation of the proposed e-waste and LIB recycling and treatment activities. The EIA was conducted in terms of the information provided to the EAP. The assessment was also conducted in terms of best available methods and legal requirements which may change over time.

12. PUBLIC PARTICIPATION PROCESS AND GOVERNMENT CONSULTATION

A comprehensive public consultation process will be undertaken in terms of Section 41 of the EIA Regulations, 2014 (as amended) to inform the I&APs of the proposed activity and to allow them to raise any concerns or give comments regarding the application. This section will elaborate on the methods that will be used to inform potential I&APs of the project. Comments and concerns raised during the public participation process will be summarised in a comments and response report which will be included in the Final Environmental Impact Report.

The following processes will be followed to inform the public of the proposed project:

12.1. Identification and Registration of I&AP's

For an efficient and effective public participation process to be undertaken, potential interested, and affected parties must be identified. Potential I&APs must include:

- The occupants of the site, and if the applicant is not the owner of the site on which proposed activities will be undertaken, the owner of the site needs to be identified.
- The owners, persons in control of, and occupiers of the land adjacent to the site where the activity is to be undertaken.
- The municipal councillor of the ward in which the site is situated and any organization of rate payers that represent the community in the area.
- The municipality which has jurisdiction in the area.
- Any organ of state having jurisdiction in respect of any aspect of the activity.
- Any other party as required by the competent authority.

A database of I&APs was developed for the application process by conducting internet and media searches of the area as well as a site visit during which surrounding landowners, businesses and residential holdings were identified. The existing I&AP database used by the facility was also incorporated. A Windeed search was conducted on the properties adjacent to the site to try and find the vacant landowners or unknown landowners surrounding the site.

Organs of state such as the Department of Forestry, Fisheries and the Environment (DFFE), Gauteng Department of Environment ('GDENV), City of Johannesburg Metropolitan Municipality has also been Identified.

Other stakeholders such as the Ward Councillor, and local NGOs for the area were also included as I&AP's.

A detailed register of potential I&APs will be developed and maintained throughout the EIA process. A summary of I&APs identified and engaged with during the EIA process will be included in the Final Environmental Impact Report.

The identified I&APs will be provided with a written notice and background information document to invite comments from all parties. This notice will also include a registration form that can be used to register I&AP's and therefore be notified of all processes occurring in the proposed projects.

12.2. Legal Notice(s) (advertisement(s))

An advertisement containing the information of the application will be placed in one local/regional newspaper to notify the potential I&APs of the proposed project and to inform them of the availability of the Draft Environmental Impact Report for comment. Proof of placement will be included in the will be included in the Final Environmental Impact Report.

12.3. Written Notices

A written notice, containing all of the relevant application information may be delivered by the following means:

- By hand delivering to:
 - The identified interested party's business or residential address
 - In the case of a juristic party, to its registered address or principal place of business
- By emailing a copy of the notice to the interested party
- By posting the notice by ordinary mail.

A Basic Information Document (BID) will also be distributed to all identified IAPs along with the written notice. Copies and records of distribution will be included in the Final Environmental Impact Report.

12.4. Site Notice

A notice will be fixed at the entrance to the existing Revive Africa Facility, as well as the adjacent building where some of the proposed activities will be undertaken. The proposed placement location is conspicuous and accessible to the public as the entrance is directly linked to Laub Street.

The notice board will be at least 60cm X 42cm. The wording and format of the required information will be displayed in a manner which is clear and legible. Photographic proof of the notice will be included in the Final Environmental Impact Report.

12.5. Communication from I&APs

Should any comments be raised by any of the notified IAP's during the 30-day commenting period will the comments be recorded and addressed in the final public participation report and the Final Environmental Impact Report which will be submitted to the competent authority for consideration.

12.6. Public meeting

No public meeting is envisioned to be conducted, however should formal requests be received during the public participation process such a meeting may be arranged and undertaken.

12.7. Circulation of the Draft Environmental Impact Report for comment

The Draft Environmental Impact Report will be made available to the public and copies supplied to the relevant authorities. Public copies of the Draft Environmental Impact Report will be placed at the following locations for easy access and review:

Hard copy: Revive Africa's offices
24 Laub Street, New Centre

Electronic copies: www.zantow.co.za (for download)
karien@zantow.co.za (on request)

Proof of distribution of the Draft Environmental Impact Report to the relevant authorities and the public will be included in the Final Environmental Impact Report.

12.8. Comments and response report

A comments and responses report will be compiled to reflect all comments received during the public participation process. A copy of the report will be submitted to the competent authority along with a copy of the Final Environmental Impact Report.

12.9. Register of I&APs

A register is maintained of all the identified I&APs.

12.10. Notification regarding the decision from DFFE

All registered I&APs will be notified of the decision made by DFFE on the application.

12.11. Engagement with government departments

A copy (hard copy or electronic copy, depending on the government entity's preferred method) of the Draft Environmental Impact Report will be provided to the Department of Environment Forestry and Fisheries as the Competent Authority and proof of submission and following communications and or comments included in the Final Environmental Impact Report.

In addition, copies of the Draft Environmental Impact Report will also be submitted to the Gauteng Department of Environment (GDEnv) and City of Johannesburg Metropolitan Municipality for review and comment as commenting authorities. Proof of submission and following communications and or comments included in the Final Environmental Impact Report.

13. DECLARATION OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

I, Karien Zantow as a registered EAP compiled this report and declare that it correctly reflects the findings made. I further declare that I,

- Act as the Independent Environmental Practitioners who were responsible for the compiling of this Environmental Impact Report,
- Conducted all work relating to this report in an objective manner even when this results in views and findings that is not favourable to the applicant,
- Declare that there are no circumstances that may compromise our objectivity in performing such work,
- Have the necessary expertise in conducting environmental impact assessments, including knowledge of the act, regulations and any other guidelines that have relevance to the activity,
- Will comply with the Act, regulations and all other applicable legislation,
- Will take into account, to the extent possible, the matters listed in the EIA regulations as published in Government Notice R982 as well as other legislation,
- Have no, and will not engage in, conflicting interests in the undertaking of the activity,
- Undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing,
 - any decision to be taken with respect to the application by the competent authority; and,
 - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority,
- Will ensure that the comments of all interested and affected parties have been considered and are recorded in this report that is submitted to the competent authority in respect of the application,
- Have kept a register of all interested and affected parties that participated in the public participation process,
- Have provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not,
- Declare that all the particulars furnished by me in this report are true and correct,
- Declare that no information provided to the Department was at no stage influenced by the applicant and that we as the appointed Environmental Assessment Practitioners have explained the potential consequences of submitting this application,
- Will perform all other obligations as expected from an EAP in terms of the Regulations; and
- Realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.


Karien Zantow
Environnemental Consultant
SACNASP Reg Nr 400114/14
EAPASA Reg 2019/1871

14. CONCLUSION

CF Africa Trading Pty (Ltd), trading as Revive Africa, currently operates a small-scale e-waste trading, storage and dismantling facility located at 24-26 Laub Street, New Centre Johannesburg. The company began operations in 2014 as a trader of empty printer cartridges that are collected through a corporate collections program. Revive Africa stores and prepare the cartridges prior to exporting them to upstream vendors for recycling. Since its inception, Revive Africa has expanded its operations into broader e-waste recycling. Since 2020, the company has collected over 434,593 laser cartridges and 982,404 ink units, keeping them out of landfill.

In April 2022, Revive Africa began trading printed circuit boards (PCBs) and collected a total of 96,306 kilograms to date. These PCBs are recovered from e-waste materials such as cell phones, computers, copiers, laptops, printers, servers, and telecommunications equipment. This initiative also led to the establishment of dedicated dismantling stations for the manual disassembly of the PCBs. The facility soon realized that many of the devices they dismantle contained lithium-ion batteries (LIBs) and began a pilot project for discharging and recycling LIBs into black mass that is traded to upstream vendors for further metal extraction.

The site falls within the jurisdiction of the City of Johannesburg Metropolitan Municipality within the Gauteng Province. The facility covers approximately 0.3 hectares and has completely been transformed by existing industrial activities. Revive Africa strives to implement a zero waste to landfill strategy in order to maximise the recovery of waste at the facility. Therefore, Revive Africa intends to conduct the following activities:

- Increasing the physical footprint of their existing operations
- Increasing the volume of waste stored, recycled, recovered and treated

Revive Africa will be contributing to the e-waste value chain by collecting and processing e-waste generated locally and selling it to upstream service providers for further processing, so the valuable materials contained in them are preserved and not discarded and lost in the economy.

The proposed waste management activities at Revive Africa will therefore trigger the following activities published under Category B of GN 921:

GNR 921 - Listed activity	Description of listed activity
B (2)	<i>The reuse or recycling of hazardous waste in excess of 1 ton per day, excluding reuse or recycling that takes place as an integral part of an internal manufacturing process within the same premises.</i>
B (3)	<i>The recovery of waste including the refining, utilisation, or co-processing of the waste at a facility that processes in excess of 100 tons of general waste per day or in excess of 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises.</i>
B (4)	<i>The treatment of hazardous waste using any form of treatment at a facility that processes in excess of 1 ton per day calculated as a monthly average, excluding the treatment of effluent, wastewater, sewage or organic waste using composting or any other organic waste treatment.</i>
B (10)	<i>The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).</i>

Revive Africa is therefore applying for a WML in terms of NEMWA, for which a Full Scoping and EIA process will be followed. The waste streams that are processed at the facility have been classified as hazardous waste. The Competent Authority (CA) for the WML application has therefore been identified as the Department of Forestry, Fisheries and the Environment (DFFE).

Additionally, the facility is registered in terms of the Norms and Standards for the Storage of Hazardous Waste with the DFFE (Reg Nr.: 12/9/11/ST574/3).

The proposed operations undertaken by Revive Africa will provide improved production rates by increasing the facility's waste recycling and recovery capacity and therefore reduce the stockpiling and unsustainable disposal of e-waste to the environment.

The activities currently undertaken by Revive Africa already adhere to the waste hierarchical approach prescribed by the NWMS. The waste hierarchical approach has been designed to promote effective waste management practices to avoid the disposal of waste and associated environmental consequences. Furthermore, the operations encourage South Africa's transition to a more circular economy by ensuring materials are recovered and kept circulating in the economy for longer. The proposed facility required for the increase in processing capacity is located within an already established and approved area suitable for industrial activities and is adjacent to the existing Revive Africa facility.

Additionally, the site is also located close to existing roadways equipped to support transport of larger loads both to and from the site. Furthermore, the selected property is already equipped with the required infrastructure to support the planned activities. Therefore, the need to develop virgin land and vegetation removal is also be eliminated. Municipal supply of both water and electricity would be sufficient to support the planned operations so no additional energy or water sources would need to be developed or established. Due to the aforementioned reasons the proposed sites, located on 24-26 Laub and 28-32 Laub street have therefore been identified as the preferred alternative for the planned operation.

The assessment of reasonable and feasible technology alternatives demonstrated that the preferred technologies for the recycling of both PCBs and LIBS provide the most appropriate balance between environmental performance, operational feasibility, resource recovery efficiency and occupational health and safety.

For the recycling of PCBs, mechanical disassembly was confirmed as the preferred technology. Although automated disassembly has the potential to improve processing speed and recovery efficiency, the environmental impact assessment identified additional operational impacts associated with increased electricity consumption, indirect greenhouse gas emissions, specialised infrastructure requirements, electronic waste generation from automation equipment, and occupational health and safety risks associated with robotic machinery. Mechanical disassembly achieves the required resource recovery objectives while reducing operational complexity, energy demand and maintenance requirements, resulting in lower residual environmental impacts following implementation of the proposed mitigation measures.

For the LIB recycling process, salt solution discharge was selected as the preferred discharge method. While resistor-based discharge provides the opportunity to recover residual electrical energy, it requires specialised electrical infrastructure, increased capital investment and introduces additional electrical safety risks. Salt solution discharge provides a safe, reliable and operationally flexible means of reducing battery reactivity prior to dismantling while requiring less infrastructure and fewer operational controls.

Following battery discharge, manual dismantling was selected as the preferred dismantling method. Although automated dismantling can increase throughput and reduce direct worker interaction with battery components, the assessment identified additional impacts associated with higher electricity consumption, increased indirect greenhouse gas emissions, greater electronic waste generation through replacement of sensors and control systems, increased maintenance requirements and potential occupational health and safety risks associated with automated moving machinery. Manual dismantling also provides greater flexibility for processing the wide variety of battery designs and

chemistries currently received by the facility while reducing operational complexity and capital requirements.

For the separation of battery materials, physical and mechanical separation was identified as the preferred technology. This process enables the efficient recovery of black mass, aluminium, copper and other recyclable materials through physical separation techniques while avoiding the use of hazardous chemical reagents. In comparison, the mechano-chemical alternative introduces additional environmental aspects associated with chemical storage and handling, hazardous wastewater generation, potential soil and groundwater contamination resulting from chemical spills, increased hazardous waste generation and potential worker exposure to hazardous substances. Consequently, the preferred physical and mechanical separation process results in lower residual environmental impacts while maintaining efficient recovery of valuable secondary materials.

The Environmental Impact Assessment identified the principal environmental aspects associated with the preferred technologies as dust and particulate emissions, hazardous waste generation, stormwater contamination, noise, energy and water consumption, occupational health and safety risks, and fire risks associated with lithium-ion battery processing. The assessment further concluded that these impacts can be effectively managed through implementation of the mitigation measures contained in the Environmental Management Programme (EMPr), including enclosed processing systems, dust and fume extraction, stormwater controls, hazardous waste management procedures, spill prevention measures, energy efficiency initiatives, fire protection systems, worker training and occupational health and safety controls. Following implementation of these mitigation measures, the majority of impacts are reduced to low or medium residual significance.

The proposed waste management activities will provide substantial positive environmental and socio-economic benefits through increased diversion of hazardous electronic waste from landfill, improved recovery of valuable secondary raw materials, reduced demand for virgin resources, promotion of South Africa's transition towards a circular economy, and the creation of additional employment opportunities. Conversely, the no-go alternative would limit Revive Africa's recycling capacity, reduce opportunities for resource recovery, constrain future employment growth and hinder the formal management of hazardous e-waste. The assessment therefore concluded that the no-go alternative is not the preferred option.

Based on the findings of the Environmental Impact Assessment, specialist studies, assessment of alternatives and the proposed mitigation measures contained in the EMPr, the preferred technologies represent the Best Practicable Environmental Option (BPEO) for the proposed waste management activities. The residual environmental impacts are considered acceptable and manageable, and no fatal flaws were identified that would preclude the proposed development from proceeding, subject to the implementation of the recommended mitigation measures and License conditions.

The draft Environmental Impact Report will be made available for comment to stakeholders for 30 days. Once the Public Participation Process in support of the EIA Phase of this application has concluded, a Final Environmental Impact Report will be compiled, and all comments and responses included before submission to the Competent Authority for consideration.

15. REFERENCES

- City of Johannesburg. (2024). *Spatial Development Framework 2040*. <https://joburg.org.za/documents/Documents/Johannesburg-Spatial-Development-Framework-2040.pdf>
- Das, P., Hewage, K., Kotagodahetti, R., Wanniarachchi, T., & Sadiq, R. (2025). Lithium-ion battery recycling: a critical review of techno-economical and socio-environmental impacts. *Separation and Purification Technology*, 135847.
- Department of Environmental Affairs and Tourism. (2005). *Environmental reporting: Integrated environmental management information series 17, Volume 3*. Pretoria.
- Etude, M. C., Ikeuba, A. I., Njoku, C. N., Yakubu, E., Uzoma, H. C., Mgbemere, C. E., & Udunwa, D. I. (2024). Recycling lithium-ion batteries: A review of current status and future directions. *Sustainable Chemistry One World*, 4, 100027.
- Haryanto, I., Mairizal, A. Q., Rhamdhani, M. A., & Dhelika, R. (2026). Comparative assessment of selective disassembly methods of end-of-life PCB using multi-criteria analysis. *Circular Economy and Sustainability*, 6(2), 70.
- Williams-Wynn, M. D., & Durski, M. H. (2025). A Review of the Use of Chemical Stabilisation Methods for Lithium-Ion Batteries. *Battery Energy*, 4(5), e20240086.
- Mohsin, M., Rovetta, S., Masulli, F., & Cabri, A. (2025). Automated disassembly of waste printed circuit boards: The role of edge computing and IoT. *Computers*, 14(2), 62.
- National Environmental Management Act (No. 107 of 1998). *Government Gazette*. South Africa, Cape Town.
- National Environmental Management Waste Act (No. 59 of 2008). *Government Gazette*. South Africa, Cape Town.
- National Waste Management Strategy. (2020). https://www.dffe.gov.za/sites/default/files/docs/nationalwaste_management_strategy.pdf
- Siame, M. C., Safdar, F., Martinez, G., Rosenkranz, J., Ahmed, H., Fabritius, T., ... Omran, M. (2025). Effect of thermal pre-treatment of spent lithium-ion batteries on the selective recovery of graphite anode by flotation. *Separation and Purification Technology*, 371, 133409.
- South African Waste Information System. Department of Environmental Affairs. <http://sawic.environment.gov.za/>
- Wu, C., Awasthi, A. K., Qin, W., Liu, W., & Yang, C. (2022). Recycling value materials from waste PCBs: Focus on electronic components, technologies, obstruction, and prospects. *Journal of Environmental Chemical Engineering*, 10(5), 108516.

Annexure A
EAP Curriculum Vitae
&
EAPASA Registration



KARIEN ZANTOW

INTRODUCTION

Karien Zantow has more than 20 years of environmental experience in the construction, mining and industrial sectors working within the legislative environment. Karien is the founding member of Zantow Environmental Consulting Services, who specialises in management of environmental projects and offers services in the preparation of a range of strategies to manage development and mitigation of potential impacts of any development or activities. Years of experience in the manufacturing industry and construction sector enables her to have a balanced approach to environmental management, with a commercial and sustainable perspective. Vast experience has been gained in the determination and improvement of legal compliance status and the development of prioritized and realistic action plans to achieve compliance. License and or environmental authorization applications can be concluded efficiently and cost effectively.

FIELDS OF EXPERTISE

Environmental Compliance Management

Air Quality Management

Water Management

Licensing, EIA's and permitting

Public Participation and Engagement

Legal Compliance Audits

Waste Management

Land Management & Remediation

Monitoring and Reporting

REGISTRATIONS / AFFILIATIONS

Registered Professional Natural Scientist with the South African Council for Natural Science as Environmental Science (Reg Nr 400114/14)

EDUCATION

BSc (Agric) Animal Sciences, Pretoria University

BSc (Hons) Environmental Engineering, Pretoria University

Post graduate Studies, Environmental Sciences, WITS University



KARIEN ZANTOW

PROFESSIONAL CAREER

2012 - Current

Zantow Environmental Consulting Services, MD

Karien is the founding member and has taken the position of Managing Director.

2006 -2012

ArcelorMittal South Africa Vanderbijlpark Works Environmental Manager

After one year Karien was promoted from Environmental Engineer to the Environmental Manager at ArcelorMittal Vanderbijlpark Works. The functions included the management of a 10 staff compliment department responsible for all environmental compliance and management functions.

She served on the Management Structure of Vanderbijlpark Works and was responsible to advise Top Management on strategic Environmental Management trends, changing legislation and ensuring legal compliance and highlight risks and provide solutions. She was responsible to drive the works to environmental compliance and ensure continued

improvement of the environmental footprint. This included the planning, prioritisation and funds management of the various environmental requirements. Under her management period remediation of various legacy issues commenced and was completed. This included the remediation of a waste disposal site and various contaminated land and dams, both organic and inorganic on a large scale. All functions related to waste, water and air quality management, from monitoring to licensing fell under her responsibility.

2004 -2006

Sappi Kraft Ngodwana

Environmental Engineer

As environmental engineer at Sappi, Karien was responsible for all aspects of environmental management in the industrial facility. This included but is not limited to the maintenance of the ISO 14001 Certification, monitoring of the plant environmental systems and operation to maintain compliance with environmental permits and other environmental requirements. This required the technical support and guidance to all levels of employees including top management. She was also the owner of all new environmental projects (example establishment of the continuous air emissions monitoring system,



KARIEN ZANTOW

ambient air quality monitoring station, waste minimisation, invader plant eradication and recycling initiatives). A key function was to manage and remediate the soil on the effluent irrigation pastures and develop and implement odour reduction strategies. This function further included the development of environmental procedures, reporting and recordkeeping. Experience was also gained in the development of the IWWMP and the Water Use License application and the associated Reserve Determination. Waste

management functions included the day to day waste management and disposal practices, waste minimisation projects as well as the landfill extension project. Karien was responsible for the entire legal compliance program, public communication, and governmental liaison.

2002 -2004

Teaching Business - Subcontracted to Barlow World Junior Business and Environmental Analyst

Specifically focussing on the sustainability and impacts from the suppliers of Barlow world. Within the consulting firm, her responsibilities included the assessment and auditing of the suppliers. The duties and responsibilities included conducting in-situ assessment of their suppliers and conduct a sustainability profile of their business, assess and advice on implementing Black Economic Empowerment, as well as auditing the environmental, health and safety policies and procedures of the suppliers.

FIELDS OF COMPETENCE

National Environmental Management Act, National Environmental Management: Air Quality Act National Environmental Management: Waste Act, Environmental Conservation Act, 1998 National Water Act, 1998 Gas Act and regulations NEMA EIA regulations and EMF; Promotion to Access of Information Act; Applicable SANS standards Applicable Regulations

KEY EXPERIENCE

- Training and Awareness

Numerous training courses have been prepared and presented to customers, mainly in the mining and industrial sectors. The courses and lectures included all aspects on Environmental Management, ISO 14001, EMPr, Waste Management and Water Management. Some courses also addressed environmental legislation and liability for employees and directors. Training material has also been developed and provided to customers to be used as awareness training material.



KARIEN ZANTOW

- Environmental Compliance and System Audits

Numerous environmental compliance audits have been conducted for facilities on existing environmental authorisations, permits or licenses. These are geared to determine compliance levels against the relevant conditions. Audits have been conducted on Water Use Licenses, Atmospheric Emission Licences, Waste Management Licenses, ECA and NEMA Authorisations and Permits and Discharge Permits as well as performance audits to EMPr's. Clients include but are not limited to:

Water Use License Audits	ArcelorMittal SA AfriSam Aquarella Investments Bumatech Cape Gate Columbus Stainless Danone
Waste Management License Audits	DMS Powders Eco Energy Infrabuild Cement Isanti Glass
Norms and Standards Audits	Intocast Quarries JJ Martiz & Son Mines Metso Minerals Nampak Glass National Ceramic Industries Nafasi Water Norcros
Atmospheric Emission License Audits	Palabora Mining Company Pinacle Metals Rockfibre SA Saldanha Steel Vaal Sanitaryware / Lixil Africa Universal Oil Solutions Universal Recycling Company
Environmental Authorisation Audits	
Environmental Management Programme Audits	
Legal Compliance Audits	

- Environmental Impact Assessments

Numerous Environmental Impact Assessments has been completed for various customers for various projects. A few is listed below:

- Adient – Automotive Foam Plant and AEL
- AfriSam Roodepoort – Waste Disposal Site Decommissioning (Basic Assessment)

K A R I E N Z A N T O W

- ArcelorMittal – Conversion of Galvanising Line, Waste Disposal Site Decommissioning
- ArcelorMittal – Proposed Waste Site Expansion (Full Scoping)
- Aveng Infraset – Closure of Quarry (Basic Assessment)
- Aveng Duraset (S24G and S22A Rectification Environmental Impact Assessment)
- Bumatech – Expansion of Waste processing site (Basic Assessment)
- Bright Refining (S24G and S22A Rectification Environmental Impact Assessment)
- Cape Gate – Abstraction of Water (Water Use License Application)
- Columbus Stainless – Proposed Dangerous Goods Storage (Basic Assessment)
- Canyon Coal – Proposed Coal Siding Project (Basic Assessment)
- Danone (Water Use License)
- Eco Energy – Decommissioning of Waste Processing Site (Basic Assessment / Waste License)
- Eco Energy – Proposed new Waste Processing Site (Basic Assessment / Waste License)
- Eco Energy – Section 24 G Rectification Environmental Impact Assessment)
- Flexilube SA – Expansion and modifications (Basic Assessment, Amendments)
- Goldplat Recovery - S22A Rectification Environmental Impact Assessment
- Intocast Quarries – EMPr Amendment and Waste License (Full Scoping)
- Retromin Refractories – Refractory brick processing plant (Basic Assessment / Waste License)
- Metso Minerals – Foundry Decommissioning Basic Assessment, Transfer Application
- National Ceramics – Gryphon (Water Use License), Gryphon (EA, AEL)
- National Ceramics – Gryphon (Water Use License), Gryphon (EA, AEL)
- National Ceramics – Pegasus (Atmospheric Emissions License (AEL) and Full Scoping EIA)
- Pinnacle Metals – Non Ferrous Recycling and Smelting plant (AEL and Full Scoping EIA)
- Reclite SA – Expansion of the Electronic and Electrical Waste processing facility
- SA Tank Terminals – Waste Treatment facility (AEL and Full Scoping EIA)



K A R I E N Z A N T O W

- Terra Nova Meyerton – Section 22 A rectification AEL and Impact Report
- Terra Nova Vanderbijlpark – Ceramic Crucible Plant (AEL and Full Scoping EIA)
- Universal Oil Solutions – Oil Recycling Facility (Full Scoping / Waste License)
- Universal Recycling Company – Ferrous Yard Scrap Recycling (Basic Assessment)
- Universal Recycling Company – Non Ferrous Yard Scrap Recycling (Full Scoping)
- Waterberg Diesel Storage Facility (Basic Assessment)
- VIP Recycling (S24 G / Impact Report)
- SA Superslag (S24 G / Impact Report)

- Environmental Control Officer Functions

Various of our customers does not have dedicated environmental resources on their premises and therefore require regular interaction and assistance in maintaining their legal compliance to the various license conditions or duty of care requirements. To this effect, a customised solution is recommended and agreed with the customer. Listed below is some of the customers that we assist on a regular basis;

- | | |
|-------------------------------|-------------------|
| - National Ceramic Industries | - Pinnacle Metals |
| - Rockfibre SA | - UOS |
| - Knights Foundry | - Eco Energy |
| - Intocast Quarries | - Retromin |

- Site Assessments, Remediation Plans and ARPs

- | | |
|------------------------|----------------------------|
| - Nampak | - Lixil Krugersdorp |
| - Aquarella Investment | - JJ Maritz and Son Mining |
| - Intocast Quarries | - Cape Gate |
| - Vaal Santiwareware | - Delmore Extension |
| - Cobra Watertech | - New Way Power |



K A R I E N Z A N T O W

F I E L D S O F E X P E R T I S E

General

- Legal compliance audits
- Monitoring and Reporting programs
- Training
- Environmental Control Officer functions
- Environmental Monitoring and Auditing
- Annual Remediation Plans

Environmental Authorisation Applications

- Environmental Impact Assessment
- Environmental Management Plans
- Water Use License Application
- Waste License Applications
- Atmospheric Emission License applications
- Rectification Applications

Waste

- Waste Classification
- Integrated Waste Management Plans
- Waste Minimization Planning and implementation
- Waste Disposal Site Management and operational Plans
- Waste disposal site closure and remediation plans

Land Management

- Site Characterization



K A R I E N Z A N T O W

- Remediation Plans
- License and authorization application

Air Quality

- Compilations and Verification of Emissions Inventory
- Emission Reduction Strategies
- NAEIS Reports, Annual Reports
- Compliance Inspections and Audits
- Postponement Applications and Amendments
- Monitoring In Accordance with New Emission Limits Standards Requirements

Water

- Water License Applications
- Integrated Waste and Water Management Plans (IWWMP)
- Storm Water Management Plans
- Water balances
- Borehole monitoring
- Surface water monitoring
- Data management and reporting



University of Pretoria

The Council and Senate hereby declare that
at a congregation of the University the degree

Baccalaureus Scientiae Agriculturae with specialisation in Animal Science

with all the associated rights and privileges
was conferred on

KARIEN DE WET

in terms of the Higher Education Act, 1997 and
the Statute of the University

On behalf of the Council and Senate
(Sgd) CWI Pistorius
Vice-Chancellor and Principal

On behalf of the Faculty of
Natural and Agricultural Sciences
(Sgd) RM Crewe
Dean

(Sgd) NJ Grové
Registrar

Date of Conferment
15 April 2003

Certified a true translation of the original Certificate

Registrar

Signed at Pretoria on the twenty-first day of February, 2013



University of Pretoria

The Council and Senate hereby declare that
at a congregation of the University the degree

Baccalaureus Scientiae Honores with specialisation in Environmental Technology

with all the associated rights and privileges
was conferred on

KARIEN DE WET

in terms of the Higher Education Act, 1997 and
the Statute of the University

On behalf of the Council and Senate
(Sgd) CWI Pistorius
Vice-Chancellor and Principal

On behalf of the Faculty of Engineering,
Built Environment and Information Technology
(Sgd) RF Sandenbergh
Dean

(Sgd) NJ Grové
Registrar

Date of Conferment
22 April 2004

Certified a true translation of the original Certificate


Registrar

Signed at Pretoria on the twenty-first day of February, 2013



Certificate of Competence

**UNIVERSITY OF THE WITWATERSRAND
JOHANNESBURG**

FACULTY OF COMMERCE, LAW & MANAGEMENT

**GRADUATE SCHOOL OF
BUSINESS ADMINISTRATION**

**MANAGEMENT ADVANCEMENT
PROGRAMME**

This is to certify that

KARIEN DE WET

attended and participated in the programme during the period

MARCH – NOVEMBER 2008

*and has completed all the requirements prescribed for the programme
(Details shown overleaf)*

A handwritten signature in dark ink, reading "Mthuli Ncube".

Head, School of Business Administration

A handwritten signature in dark ink, reading "Katherine A. Munro".

Dean, Faculty of Commerce, Law & Management

Signed in Johannesburg on 21 November 2008

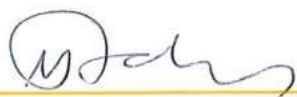


Certificate of A t t e n d a n c e

Karien Zantow

Mine Closure Legislation
Amendments

17 November 2020



Meloshni Andrews
Chief Executive Officer

Validation Number: FAMC 2018/1219

CPD Points: 1



UNIVERSITY OF THE
WITWATERSRAND
JOHANNESBURG



Private Bag 3 Wits, 2050
Fax: 02711 7176029
Tel: 02711 7176006

Reference: Ms Louise du Plooy
E-mail: louise.duplooy@wits.ac.za

04 November 2014
Person No: 0618386K

Ms K De Wet
Po Box 3858
1911
South Africa

Dear Ms De Wet

Congratulations on completing the requirements for the **Postgraduate Diploma in Science**.

Enclosed is a copy of a full academic record for the years that you have been at Wits. Please keep this document safely as you may need it from time to time.

Congratulations and best wishes.

Yours sincerely

A handwritten signature in black ink, appearing to read 'René Vosloo'.

Ms René Vosloo
Faculty Registrar
Faculty of Science

CERTIFICATE



This is to certify that

K. DE WET

Has successfully completed the

**ISO 14001:2004
Revision Course**

Organised by BSI Quality Services (Pty) Ltd

Certified by:

**Presenter
E.A. Holmes**

Date:

4 February 2005

Certification No:

20050213 – QU10



1 Data Street, Ormonde, 2091 • P.O. Box 2079, Southdale, 2135, South Africa
Tel: +27 (0)11 496 3500 • Fax: +27 (0)11 496 3504

The British Standards Institution is incorporated by Royal Charter

**Environmental Assessment
Practitioners Association
of South Africa**



Registration No. 2019/1871

Herewith certifies that

KARIEN ZANTOW

is registered as an

Environmental Assessment Practitioner

**Registered in accordance with the prescribed criteria of Regulation 15. (1)
of the Section 24H Registration Authority Regulations
(Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the
National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).**

Effective: 01 April 2026

Expires: 31 March 2027

Chairperson

Registrar





herewith certifies that

Karien Zantow

Registration Number: 400114/14

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)

in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)

Effective **12 March 2014**

Expires **31 March 2027**



A stylized, handwritten signature in black ink, likely belonging to the President of the Council.

President of Council

A stylized, handwritten signature in black ink, likely belonging to the Chief Executive Officer.

Chief Executive Officer



Annexure B

Content of Environmental Impact Report Compared to GNR 982

Content of the Environmental Impact Report in terms of Appendix 3 of the EIA regulations

Requirement for the Environmental Impact report (Appendix 3 of GNR 982)	Page of Environmental Impact with information
(a) details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Section 2.2 Section 2.4 & Annexure A
(b) the location of the activity, including- (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name. (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 3.2 – 3.3 Annexure C & Annexure K
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 3 & Annexure C
(d) a description of the scope of the proposed activity, including- (i) all listed and specified activities triggered (ii) a description of the activities to be undertaken, including associated structures and infrastructure;	Section 1.1 – 1.2 & Section 5
(e) a description of the policy and legislative context within which the development is proposed including— (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Section 5
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 6
(g) a motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;	Section 6.5 & Section 7.1
(h) a full description of the process followed to reach the proposed preferred activity, site and location within the site, including - (i) details of all the alternatives considered;	Section 6 & Section 7
(ii) details of the PPP undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 12

Content of the Environmental Impact Report in terms of Appendix 3 of the EIA regulations

Requirement for the Environmental Impact report (Appendix 3 of GNR 982)	Page of Environmental Impact with information
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	No issues raised thus far
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 7 & Section 8
(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which these impacts- (aa) can be reversed. (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed, or mitigated;	Section 11.5 - 11.9
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 11.1
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 11.2 & 11.5 - 11.9
(viii) the possible mitigation measures that could be applied and level of residual risk;	Section 11.3 & 11.5 - 11.9
(ix) if no alternative development footprints for the activity were investigated, the motivation for not considering such; and;	Section 7.1
(x) a concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report;	Section 7.1
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 7.4
(i) full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including-	Section 11
(a) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	Section 7
(b) a description of the aspects to be assessed as part of the environmental impact assessment process;	Section 10
(c) aspects to be assessed by specialists;	Section 10.1

Content of the Environmental Impact Report in terms of Appendix 3 of the EIA regulations

Requirement for the Environmental Impact report (Appendix 3 of GNR 982)	Page of Environmental Impact with information
(d) a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;	Section 11
(e) a description of the proposed method of assessing duration and significance;	Section 11
(f) an indication of the stages at which the competent authority will be consulted;	Section 12.11
(g) particulars of the public participation process that will be conducted during the environmental impact assessment process; and	Section 12
(h) a description of the tasks that will be undertaken as part of the environmental impact assessment process;	Section 9
(i) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	Section 11 & Annexure I
j) an undertaking under oath or affirmation by the EAP in relation to-	Section 13
(a) the correctness of the information provided in the report;	
(b) the inclusion of comments and inputs from stakeholders and interested and affected parties; and	
(c) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	
(k) an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	
(l) where applicable, any specific information required by the competent authority; and	Noted
(m) any other matter required in terms of section 24(4)(a) and (b) of the Act.	Noted

Annexure C

Site Maps

Revive Africa: Locality Map (1: 10 000)

Legend

- Boundary
- ▲ Revive Africa Point



Client: Revive Africa
Author: CJD Tolken
Datum Projection: WGS 84



Revive Africa: Locality Map (1: 10 000)

Legend

- Boundary
- ▲ Revive Africa Point



Client: Revive Africa
Author: CJD Tolken
Datum Projection: WGS 84



0 250 500 750 1 000 m

Revive Africa: Locality Map (1: 10 000)

Legend

— Boundary

▲ Revive Boundary

A: -26.216025, 28.046597

B: -26.216342, 28.046578

C: -26.216372, 28.047053

D: -26.216383, 28.047053

E: -26.216395, 28.047287

F: -26.216397, 28.047289

G: -26.216414, 28.047519

H: -26.216219, 28.047528

I: -26.216078, 28.047542

J: -26.216050, 28.047073

K: -26.216153, 28.047071

L: -26.216136, 28.046828

M: -26.216037, 28.046833



Client: Revive Africa
Author: CJD Tolken
Datum Projection: WGS 84



0 250 500 750 1 000 m

Revive Africa: Layout Map (1: 10 000)

Legend

- ▲ Revive Africa Point
- Boundary
- Local Businesses
- Major Roads



Client: Revive Africa
Author: CJD Tolken
Datum Projection: WGS 84



0 250 500 m

Wemmer Pan Rd

Wemmer Pan Rd

Wemmer Pan Rd

Eloffst

Eloffst

Eloffst

Hoffmann Power

Paris Belts

NOVA Papers CC

Revive Africa

Ezee Chem

RSE Electronics

Dongmo Furniture Warehouse

Ubuntu Crafts

Doyer Parts

The Cable co

MTN

R29

R29

R29

R29

M2

M2

M2

M2

Legend

Major Roads

Existing Facility

Expansion

Coordinates:

A: -26.216025, 28.046597

B: -26.216342, 28.046578

C: -26.216372, 28.047053

D: -26.216383, 28.047053

E: -26.216394, 28.047286

F: -26.216397, 28.047289

G: -26.216414, 28.047519

H: -26.216219, 28.047528

I: -26.216078, 28.047539

J: -26.216050, 28.047072

K: -26.216153, 28.047069

L: -26.216136, 28.046828

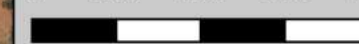
M: -26.216036, 28.046833



Client: Revive Africa
Author: CJD Tolken
Datum Projection: WGS 84



0 100 200 300 400 m



Legend

▲ Revive Africa

5 km Buffer

Geology

Amphibolite, serpentine
(met., mafic and ultramafic rock)

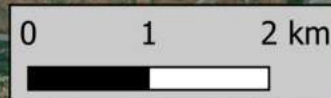
Felsic, intermediate rocks

Mafic and Ultramafic
volcanic rocks

Siliciclastic rocks



Client: Revive Africa
Author: CJD Tolken
Datum Projection: WGS 84



Legend

- ▲ Revive Africa
- Grade I Heritage Site
- Grade II Heritage Sites
- ◻ 2 Km Buffer
- ◻ 5 Km Buffer



0 1 2 km

Client: Revive Africa
Author: CJD Tolken
Datum Projection: WGS 84

Revive Africa: Civil Aviation Map (1: 40 000)

Legend

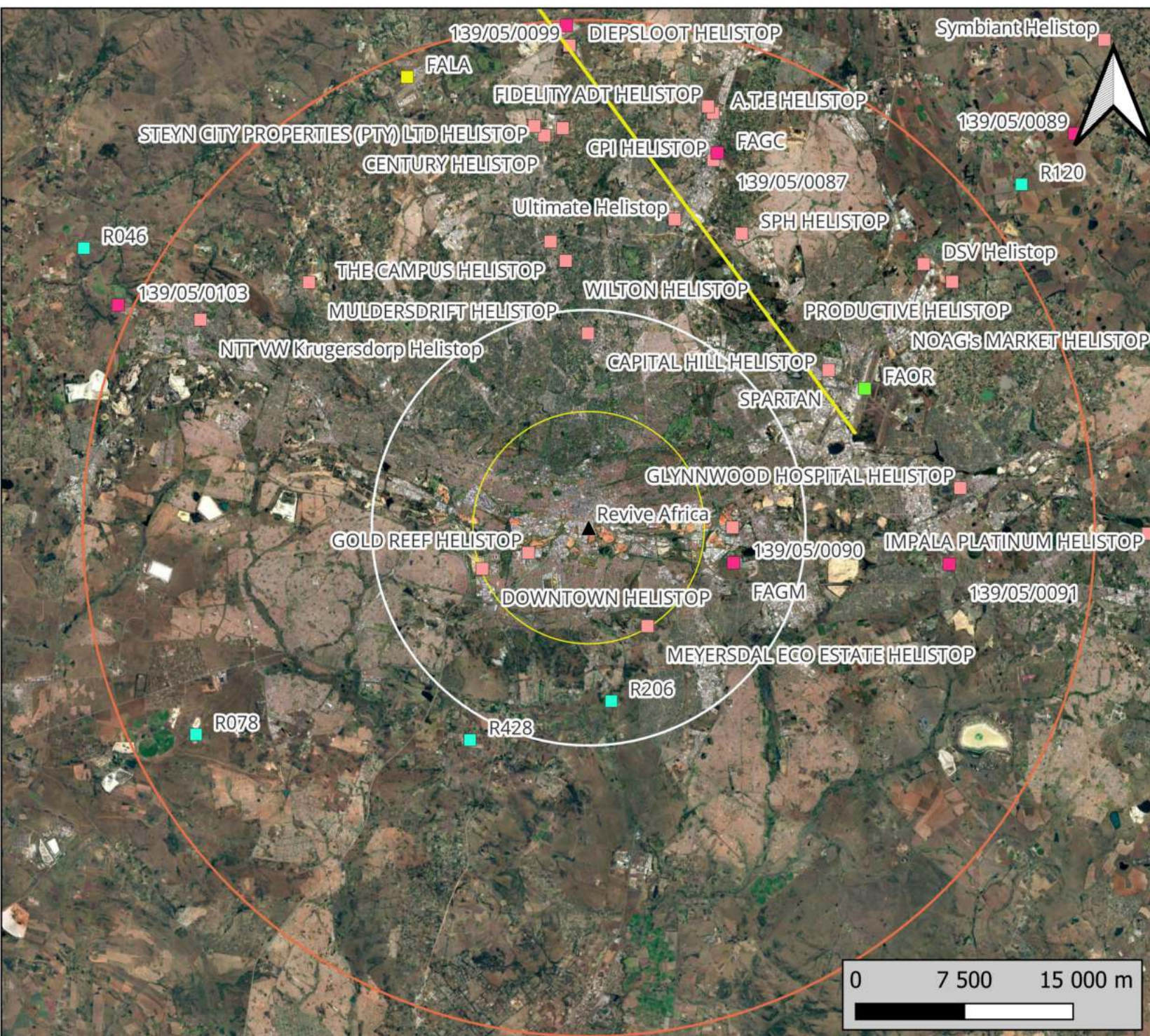
- ▲ Revive Africa
- 15km_Buffer
- 35km_Buffer
- 8km_Buffer
- Aerodromes & Helistops — ACSA (9)
- Aerodromes & Helistops — Helistops (AIC) - (94)
- Aerodromes & Helistops — Other (12)
- Aerodromes & Helistops — SACAA Approved (116)
- Aerodromes & Helistops — SACAA New Aerodrome (319)



Client: Revive Africa
Author: CJD Tolken
Datum Projection: WGS 84



0 7 500 15 000 m



Annexure D

Screening Tool Report

**SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS
REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE
ENVIRONMENTAL SENSITIVITY**

EIA Reference number: 12/9/11/L260413152509/3/N/Revive Africa Hazardous Waste Treatment Facility

Project name: Revive Africa WML Application

Project title: Waste Management Licence Application for the Proposed Electronic Waste (E-Waste) Recycling, Recovery and Treatment Facility to be Undertaken by CF Africa Trading (Pty) Ltd, trading as Revive Africa, located in New Centre, Johannesburg, Gauteng

Date screening report generated: 06/07/2026 10:34:38

Applicant: CF Africa Trading (Pty) Ltd

Compiler: Zantow Environmental Consultants

Compiler signature:

.....

Application Category: Services|Waste Management Services|Treatment facilities|Hazardous

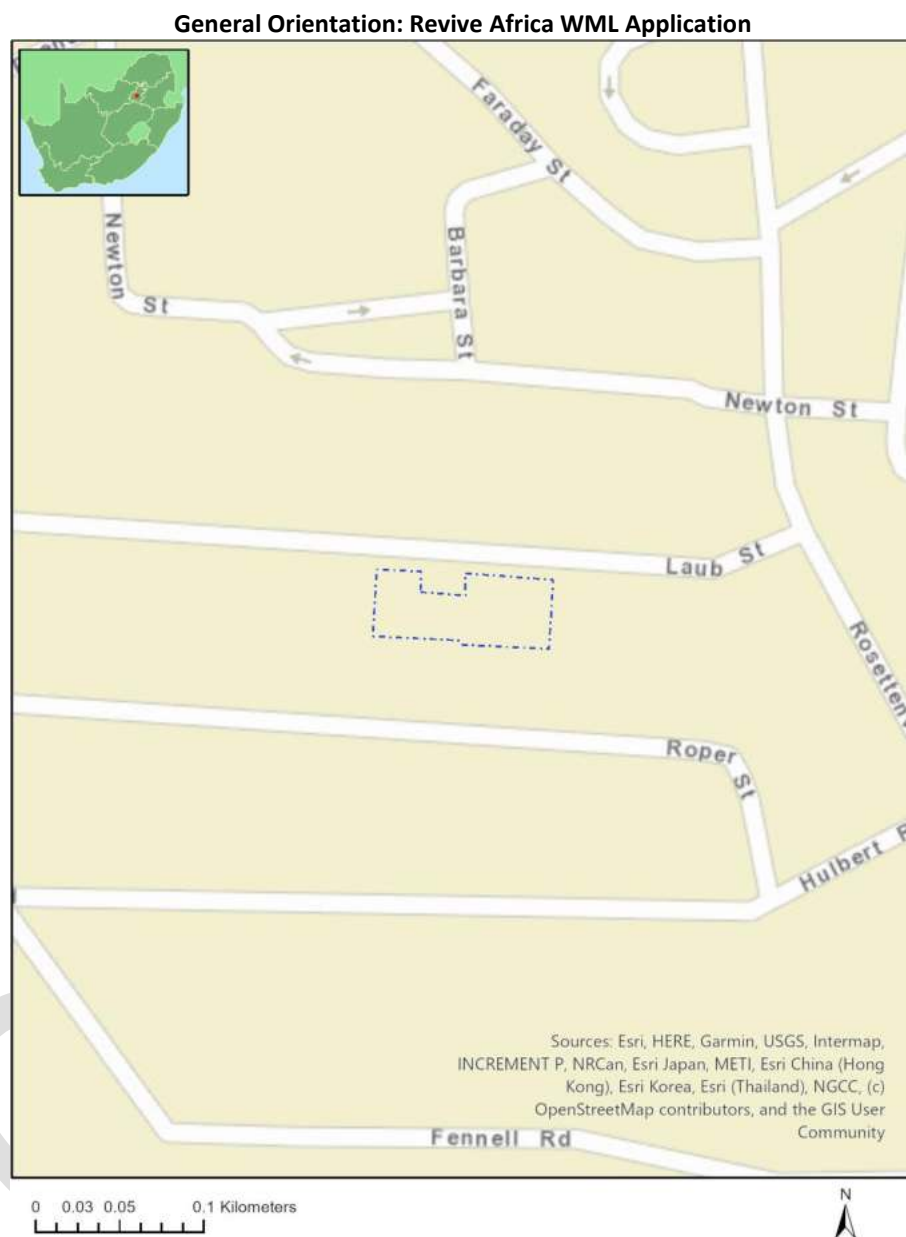


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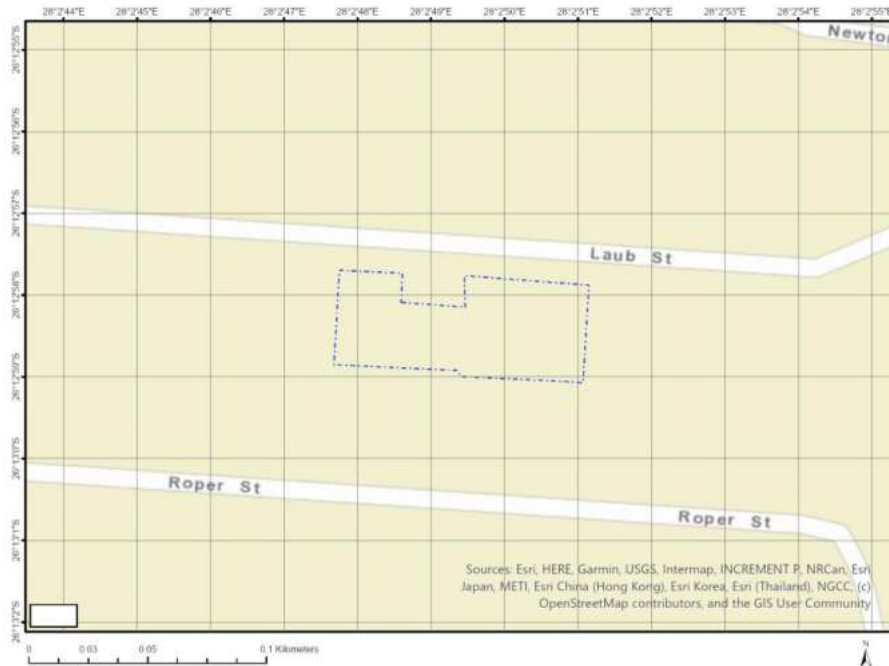
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Proposed Project Location

Orientation map 1: General location



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	NEW CENTRE	47	0	26°12'58.45S	28°2'50.69E	Erven
2	NEW CENTRE	137	0	26°12'58.33S	28°2'48.56E	Erven
3	NEW CENTRE	45	0	26°12'58.4S	28°2'49.83E	Erven
4	TURFFONTEIN	96	0	26°12'53.33S	28°2'14.79E	Farm
5	TURFFONTEIN	96	343	26°12'59.5S	28°2'47.36E	Farm Portion

Development footprint¹ vertices:

No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No	EIA Reference No	Classification	Status of application	Distance from proposed area (km)
1	002/15-16/E0152	Solar PV	Approved	10.2
2	14/12/16/3/3/2/825	Solar PV	Approved	27.4
3	12/12/20/2147	Solar PV	Approved	22.5

¹ "development footprint", means the area within the site on which the development will take place and includes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below.

Incentive, restriction or prohibition	Implication
Strategic Transmission Corridor-Central corridor	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/Combined_EGI.pdf
Strategic Gas Pipeline Corridors-Phase 3: Richards Bay to Gauteng	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/Combined_GAS.pdf
Gauteng EMF-Industrial and large commercial focus zone 5	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/Zone5_2021.pdf

Proposed Development Area Environmental Sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme			X	
Animal Species Theme			X	
Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme	X			
Civil Aviation Theme		X		
Defence Theme				X
Paleontology Theme				X
Plant Species Theme				X

Specialist assessments identified

Based on the selected classification, and the known impacts associated with the proposed development, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

No	Specialist assessment	Assessment Protocol
1	Agricultural Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Agriculture_Assessment_Protocols.pdf
2	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/GuidanceforHIA.pdf
3	Palaeontology Impact	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/GuidanceforHIA.pdf

	Assessment	ssmentProtocols/GuidanceforPIA.pdf
4	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Terrestrial Biodiversity Assessment Protocols.pdf
5	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Aquatic Biodiversity Assessment Protocols.pdf
6	Hydrology Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted General Requirement Assessment Protocols.pdf
7	Noise Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Noise Impacts Assessment Protocol.pdf
8	Traffic Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted General Requirement Assessment Protocols.pdf
9	Geotechnical Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted General Requirement Assessment Protocols.pdf
10	Health Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted General Requirement Assessment Protocols.pdf
11	Socio-Economic Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted General Requirement Assessment Protocols.pdf
12	Ambient Air Quality Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted General Requirement Assessment Protocols.pdf
13	Air Quality Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted General Requirement Assessment Protocols.pdf
14	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Plant Species Assessment Protocols.pdf
15	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Animal Species Assessment Protocols.pdf

Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

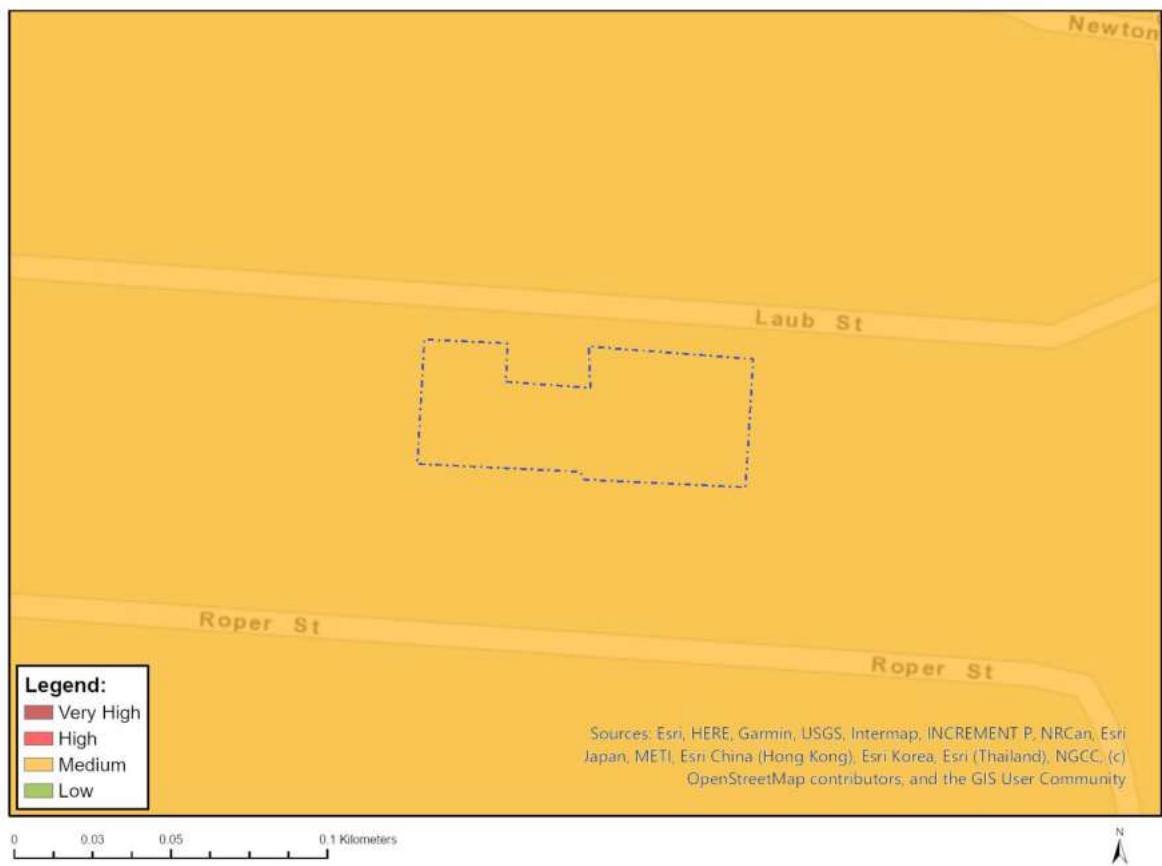


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	07. Low-Moderate

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Mammalia-Chrysospalax villosus
Medium	Mammalia-Crocidura maquassiensis
Medium	Invertebrate-Clonia uvarovi

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	Within 5km of a Grade I Heritage site
Very High	Within 2km of a Grade II Heritage site

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Within 15 km of a civil aviation radar
High	Between 8 and 15 km from a major civil aviation aerodrome
High	Within 8 km of other civil aviation aerodrome
Medium	Between 15 and 35 km from a civil aviation radar
Medium	Between 15 and 35 km from a major civil aviation aerodrome
Medium	Between 8 and 15 km of other civil aviation aerodrome

MAP OF RELATIVE DEFENCE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Features with a Low paleontological sensitivity

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

Annexure E

Site Photos

Site Photographs



Picture 1: North



Picture 2: North-East



Picture 3: East



Picture 4: South-East



Picture 5: South



Picture 6: South-West



Picture 7: West



Picture 8: North-West

Annexure F

Site Sensitivity Verification Report

**ENVIRONMENTAL SITE SENSITIVITY VERIFICATION IN SUPPORT OF:
A WASTE MANAGEMENT LICENCE APPLICATION FOR THE
PROPOSED HAZARDOUS WASTE (E-WASTE) RECYCLING,
RECOVERY AND TREATMENT FACILITY
AT REVIVE AFRICA,
LOCATED IN
NEW CENTRE, JOHANNESBURG, GAUTENG**



Report date: 15th November 2025

Report No: 3891-ZANREV-2025

General Information	
Report Name:	Environmental Site Sensitivity Verification in Support of a Waste Management Licence Application for the Proposed Hazardous Waste (E-Waste) Recycling, Recovery and Treatment Facility at Revive Africa, Located in New Centre, Johannesburg, Gauteng
Site Verification Date:	5 th November 2025
Report Date:	15 th November 2025
Environmental Consultant	Zantow Environmental Consulting Services CC Coliseum Building 1st Floor, Unit 2 Cnr Delius Street & Chopin Street Vanderbijlpark, 1911 PO Box 3858 Vanderbijlpark, 1911 Contact Person: Karien Zantow Tel: 083 384 3641 Email: karien@zantow.co.za
Client:	CF Africa Trading t/a Revive Africa 24 Laub Street New Centre Johannesburg 2001 Contact Person: Fergus Slattery Tel: 011 493 5700 Cell: 081 747 2326 Email: fergus@reviveafrica.co.za
Report Compiled by:	Mbali Zwane
Report Reviewed by:	Karien Zantow
Report Nr:	3891-ZANREV-2025

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1. INTRODUCTION

1.1 Introduction to the proposed activity

CF Africa Trading Pty (Ltd), trading as Revive Africa, currently operates a small-scale e-waste trading, storage and dismantling facility located at 24-26 Laub Street, New Centre Johannesburg. The company began operations in 2014 as a trader of empty printer cartridges that are collected through a corporate collections program.

Current waste management operations

Revive Africa stores and prepare the cartridges prior to exporting them to upstream vendors for recycling. Since its inception, Revive Africa has expanded its operations into broader e-waste recycling. Since 2020, the company has collected over 434,593 laser cartridges and 982,404 ink units, keeping them out of landfill.

In April 2022, Revive Africa began trading printed circuit boards (PCBs) and collected a total of 96,306 kilograms to date. PCBs are recovered from e-waste materials such as cell phones, computers, copiers, laptops, printers, servers, and telecommunications equipment. This initiative also led to the establishment of dedicated dismantling stations for the manual decontamination of the PCBs. Manual decontamination of e-waste also known as manual dismantling or depollution, involves the careful, non-destructive disassembly of electronic equipment by hand using tools such as screw drivers, hammers etc. to remove hazardous substances and separate materials for recycling. This process is crucial to isolate toxic components (like mercury, lead, and cadmium) from high-value materials (gold, copper, plastics), enhancing safety and recovery rates. The facility soon realized that many of the devices they dismantle contained lithium-ion batteries (LIBs) and began a pilot project for discharging and recycling LIBs into black mass that is traded to upstream vendors for further metal extraction. (*Existing Recycling, recovery and or treatment, below the threshold of the WML requirements*)



Current storage, sorting and receiving



Current manual depopulation of e-waste and battery recycling



Figure 1: Revive Africa Facility 24-26 Laub Street (Existing facility layout).

Revive Africa plans to establish a full-scale e-waste recycling facility comprising a PCB Recycling Plant and a Lithium-Ion Battery Recycling Plant. This project aims to process materials locally, create employment, and contribute to sustainable resource recovery in South Africa.

The proposed recycling facility entails increasing the volumes of e-waste accepted, as well as expanding their footprint to the adjacent buildings in 29-32 Laub Street, New Centre Johannesburg. The proposed services for the e-waste management processes include recycling, treatment and recovery of e-waste and LIBs.

The planned PCB recycling facility will cover 1,800 m², dedicated to e-waste storage, dismantling, and processing. The plant will be capable of processing 40-50 tons of PCBs per month and is expected to create at least 15 new jobs, depending on volume. PCBs will be collected, graded, shredded and sold to upstream vendors for further processes.

The battery recycling facility will occupy approximately 900 m², for battery storage, discharging, shredding, and screening. It will have the capacity to process up to four (4) tons of lithium-ion batteries per day. The process involves discharging batteries, shredding them into granulate, and screening the granulate to separate the black mass from plastic and copper residues. Comprehensive environmental and safety controls will be implemented to manage VOCs, fluorinated gases, and particulate emissions to ensure safe operations.

The proposed operational area for the PCB and LIB recycling processes is projected to be as follows:

Aspect	Existing Process	Proposed Operational Area	
PC Boards	Manual depollution and export to upstream vendors < 500 kg/day	E-waste storage	800m ²
		Dismantling facility	200m ²
		Processing area	800m ²
		Storage	300m ²

Lithium-Ion Batteries	Pilot-scale discharging and shredding < 500 kg/day	Discharge	200m ²
		Shredding	300m ²
		Screening	100 m ²

E-waste, consisting mainly of printer cartridges, printed circuit boards (PCBs) and Lithium-Ion batteries are collected through a corporate collections program before being transported to the Revive Africa facility. Majority of the material received is only subjected to re-packaging before being traded to upstream vendors for further processing. Small scale trials have been undertaken by Revive Africa to process small quantities (less than 500kg per day) of E-waste to generate materials which could be subjected to further processing for additional recovery and recycling.

With the proven success of the trials, Revive Africa is now proposing to expand their physical footprint and increase the volumes of e-waste accepted in order to implement a full-scale recycling and recovery initiative which would include a Lithium-Ion Battery recycling plant and a PC Board recycling plant.

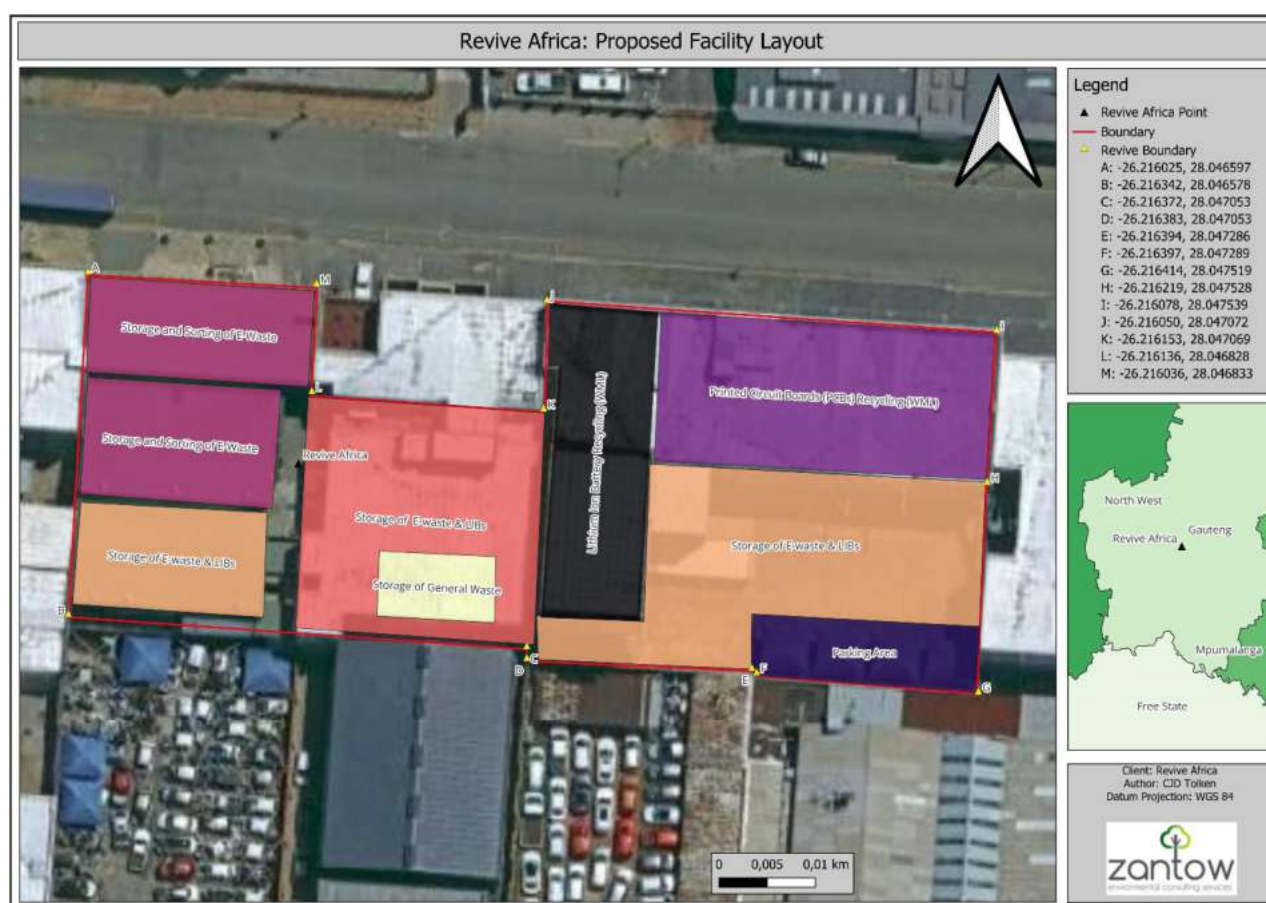


Figure 2: Revive Africa Facility 28-32 Laub Street (Proposed layout).

In order to facilitate the planned waste management activities, the facility's footprint will be extended to include a secondary warehouse located at 29-32 Laub Street, New Centre, Johannesburg an adjacent property (refer to Figure 3 below).

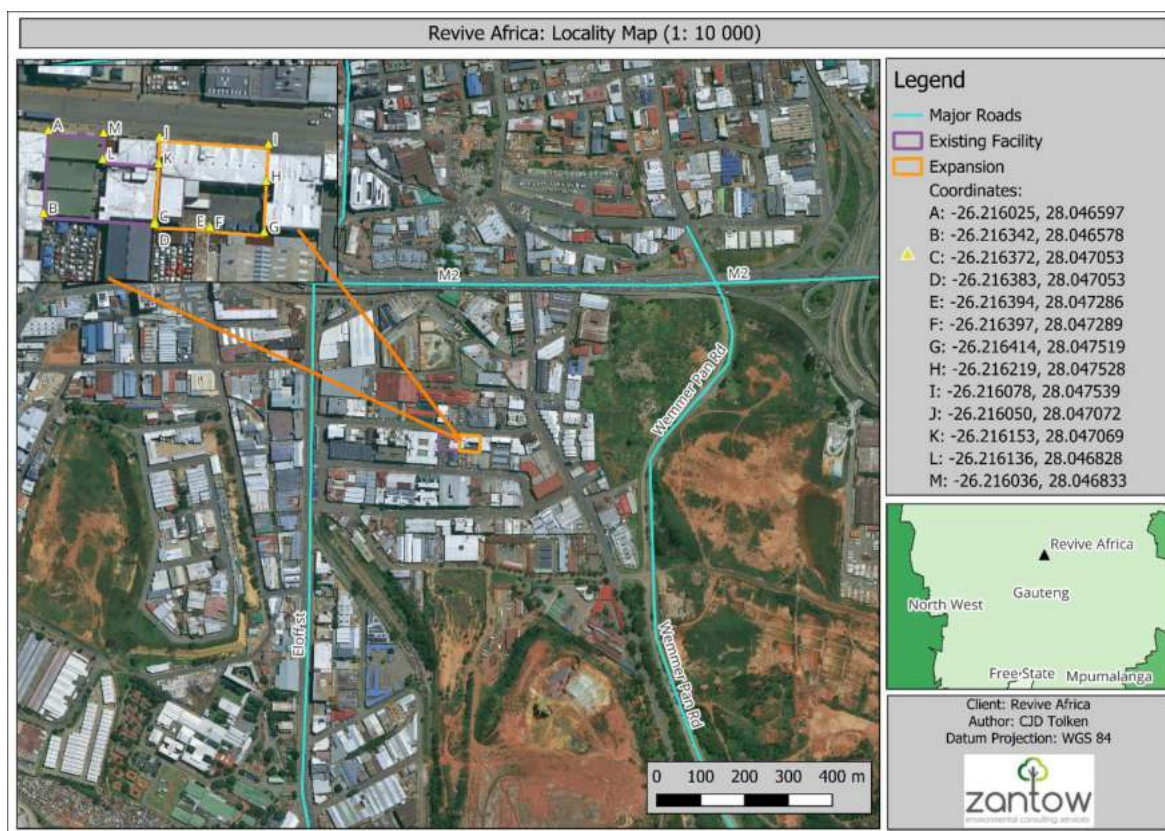


Figure 3: Revive Africa Facility 24-32 Laub Street (Existing facility and proposed facility).

In terms of the National Environmental Management: Waste Act (No. 59 of 2008) (NEM: WA), waste management activities that are listed in the regulations published under NEM: WA may not be undertaken without a Waste Management License (WML). The listed activities for which a WML is required are contained in Government Notice (GN) 921. Category A listed activities require that a WML application and a Basic Impact Assessment (BA) process be conducted, and Category B activities require that a WML application and full Scoping and Environmental Impact Assessment (EIA) process be conducted.

The proposed waste management activities at Revive Africa will therefore trigger the following activities published under Category B of GN 921:

GNR 921 - Listed activity	Description of listed activity
B (2)	The reuse or recycling of hazardous waste in excess of 1 ton per day, excluding reuse or recycling that takes place as an integral part of an internal manufacturing process within the same premises.
B (3)	The recovery of waste including the refining, utilisation, or co-processing of the waste at a facility that processes in excess of 100 tons of general waste per day or in excess of 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises.
B (4)	The treatment of hazardous waste using any form of treatment at a facility that processes in excess of 1 ton per day calculated as a monthly average, excluding the treatment of effluent, wastewater, sewage or organic waste using composting or any other organic waste treatment.
B (10)	The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).

Therefore, a Scoping and Environmental Impact Assessment (EIA) Process will be followed in order to obtain a WML for the operational (recovery and recycling and treatment) activities planned by Revive Africa.

1.2 Purpose of the report

On the 20th of March 2020, the Department of Forestry, Fisheries and the Environment (DFFE) published procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of section 25(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for an Environmental Authorisation. These regulations require that an applicant must conduct an environmental sensitivity assessment of the site by utilising the Department's national web-based environmental screening tool.

When environmental sensitivities are identified for the site by utilising the screening tool, the Environmental Assessment Practitioner (EAP) must conduct a site sensitivity verification to confirm or dispute the current use of the land as well as the environmental sensitivity as identified by the screening tool.

The outcome of the site verification must be presented in the form of a report and contain the minimum requirements as set out in GN No. 320.

1.3 Expertise of the EAP conducting the site verification

Zantow Environmental Consulting Services has been appointed by Revive Africa to facilitate the process for the Application for an Environmental Authorisation. The following is a description of the EAP's expertise:

➤ Karien Zantow

Karien Zantow obtained her degree from the University of Pretoria in BSc (Agric) Animal Science. The main subjects were Physiology, Nutrition, Ecology, Biochemistry, Toxicology, Plant production, Soil Science and Pasture Science. This degree provided her with a sound base and understanding of the environment.

Karien extended her knowledge in the environmental sciences by completing the BSc (Hons) Environmental Technology at the University of Pretoria. The honours degree presented by the Chemical Engineering department addressed Environmental management that included South African environmental legislation, ISO 14001, Environmental impact assessments, Life cycle assessment, auditing and public participation. As well as the three specialized fields of study: Water (wastewater treatment and design), air (abatement equipment) and solid/hazardous waste management. She also completed a Post Graduate diploma in Environmental Sciences at the University of Witwatersrand which focussed on Environmental Law, Environmental Chemistry, Air quality and Energy, Waste and Wastewater management and Environmental Impact Assessments.

Karien Zantow has more than 15 years of environmental experience in the construction, mining and industrial sectors working within the legislative environment.

- Teaching Business, subcontracted to Barlow World
- Sappi Kraft Ngodwana– As environmental engineer
- ArcelorMittal South Africa Vanderbijlpark Works
- Zantow Environmental Consulting Services

During her career she has been involved with many large-scale site characterisation and remediation projects from the conceptual phase to implementation. Other projects include a variety of Waste Management Licences, Atmospheric Emissions Licences, other EIA's and Environmental Audits. Moreover, emission sampling and reporting forms a core component of Karien's scope of work.

Karien is a registered Natural Science Professional with the South African Council for Natural Scientific Professions (Reg Nr 400114/14) as well as a Registered EAP (Reg Nr 2019/1871).

➤ **Mbali Zwane**

Mbali obtained her B.Sc. Environmental Management and Geography degree, from the University of Johannesburg. Her main subjects of study included Geographic Information Systems (GIS), Environmental Management, and Zoology. This degree provided Mbali with a sound base and understanding of the environment, and human impacts on the environment. Mbali went on to complete her B.Sc. Honours Degree in Geography from the University of Johannesburg in 2020. The main subjects focused on within her Honours Degree included but were not limited to Strategic Environmental Management, Geographic Information Systems (GIS) and Remote Sensing. Furthermore, Mbali has obtained a M.Sc. in Environmental Management at the University of Johannesburg in 2023.

During her years of study at the University of Johannesburg, Mbali gained more than 4 years' experience working at the University of Johannesburg's Process Energy and Environmental Technology Station (UJ PEETS) as a research assistant and junior project manager between June 2021 and September 2023 and as the program manager at the same organisation between October 2023 and June 2025 for the resource efficiency and circular economy unit. is a registered as a Certificated Natural Scientist with the South African Council for Natural Scientific Professions (Reg Nr: 170448). Mbali is currently appointed as an Environmental Consultant at Zantow Environmental Consulting Services.



Karien Zantow
Environmental Consultant
SACNASP Reg Nr 400114/14
EAPASA Reg Nr 2019/1871



Mbali Zwane
Environmental Specialist
SACNASP Reg Nr 170448

2. SITE SENSITIVITY VERIFICATION

The National web based environmental sensitivity screening tool was utilised in order to identify the potential site sensitivities.

The screening tool identified the following sensitivities:

Table 1: Site Sensitivities as identified by the Screening Tool

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme			X	
Animal Species Theme			X	
Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme	X			
Civil Aviation Theme		X		
Defence Theme				X
Palaeontology Theme				X
Plant Species Theme				X

After generating the Screening tool report, a site visit was conducted on the 5th of November 2025 to verify the current land use and environmental sensitivity of the site. Thereafter a desktop study was undertaken to ensure that the environmental site sensitivities identified are applicable.

2.1 Desktop Analysis

A satellite image was generated of the site utilising Google Earth Pro. As can be seen on the figure below, the site is located within an existing industrial area with existing infrastructure, and which has already been disturbed.



It can be concluded that the site already has no agricultural potential, any heritage and palaeontological finds would have been made when the site was established, and no plants and animals, that are sensitive, are found in the development footprint within the boundaries of an industrial site.

The following is a description of all environmental sensitivities identified by the National Screening Tool:

- **Agricultural Theme**

The screening tool identifies the area for the proposed development footprint as a medium sensitivity for the Agricultural Theme, with a low to moderate land capability.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



Figure 4: Agricultural Theme Sensitivity

The site is however located within the footprint of an area that has been transformed for industrial activities. Therefore, no agricultural activities will be able to take place at the site as it is not in line with the current land use and zoning.

According to the protocol for specialist assessment and minimum content requirements for environmental impacts on agricultural resources (GN 320 of March 2020) an Environmental Assessment Practitioner (EAP) can dispute the site sensitivity identified by the Screening Tool.

The environmental sensitivity is therefore argued to be a low sensitivity as no agricultural activities will be able to be undertaken on the proposed site.

➤ **Animal Species Theme**

The screening tool identifies the area for the proposed development footprint as a medium sensitivity for the Animal Species theme.

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY

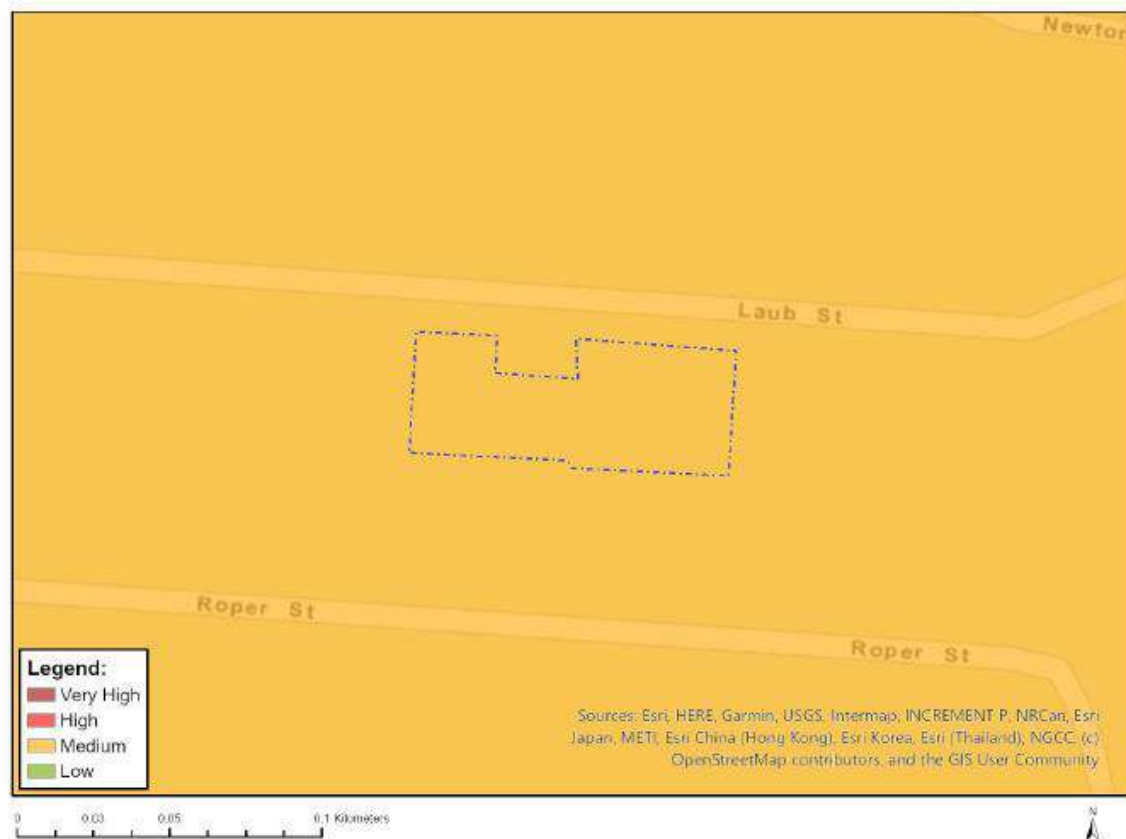


Figure 5: Animal Species Theme

The Screening tool identified the following sensitivity features in the area:

- **Mammalia *Chrysospalax villosus***- which is an owl commonly referred to as the Roughed-haired Golden Mole. According to SANBI this species has a disjunct distribution in South Africa, being recorded only from scattered localities in Eastern Cape, KwaZulu-Natal, Gauteng and Mpumalanga provinces. It is found on sandy soils in grasslands, meadows and along edges of marshes in Savanna and Grassland biomes of South Africa. The species is currently classified as vulnerable, within the region, however, the status might change to endangered as the number of known locations decline further.



Figure 6: Roughed-haired Golden Mole

- **Mammalia *Crocidura maquassiensis***- which is commonly referred to as the Makwassie musk shrew. According to SANBI it is endemic to South Africa, Eswatini and Lesotho, existing in moist

grassland activities in the Savannah and Grassland biomes. Within South Africa it is found in the Limpopo, North West, Gauteng, KwaZulu-Natal and Mpumalanga regions. The species is classified as vulnerable due to loss of habitat in the region.



Figure 7: Makwassie musk shrew (example)

The species was not noted to be present during the site visit. Its habitat is also not found in the area. The proposed development footprint is a built-up area and therefore there is no habitat for the species.

- **Mammalia *Dasymys robertsii***- which is commonly referred to as the African Marsh Rat is a species that is highly dependent on intact rivers and wetland ecosystems. According to SANBI the species is near threatened due to loss of habitat and are found mostly in protected areas in the Western Cape with some of them being endemic to specific regions.



Figure 8: African Marsh Rat (Example)

The proposed development area does not exhibit the type of habitat the species would be in and is therefore not expected that this animal will be present onsite.

- **Mammalia-*Hydrictis maculicollis***- which is commonly referred to as a spotted neck otter. According to SANBI these otters occur all over South Africa in freshwater systems, it is however, restricted to areas of permanent freshwater offering good shoreline cover and an abundant prey base.



Figure 9: Spotted-necked otter

The proposed development area is not located near any naturally occurring freshwater resources. Therefore, it is not expected that this animal will be present onsite.

- **Invertebrate-Clonia uvarovi**- which is a cricket commonly referred to as Uvarov's bush cricket. According to SANBI it is endemic to the highveld region of South Africa and has only been recorded from Gauteng and North West provinces. The species occurs in tall woodland savannah areas which are under intensive grazing pressure by livestock and wildlife, cultivation with non-timber crops, and urban development. The species is classified as vulnerable.



Figure 10: Uvarov's bush cricket (example).

The environmental sensitivity for the Animal Species Theme is therefore argued to be a low sensitivity and not medium. As an assessment conducted by a registered specialist with a drafted compliance statement verifying the EAPs observations that none of these identified species are expected to be present in the proposed site due to the high level of disturbances and absence of suitable habitat. The compliance statement will be attached in the Basic Assessment Report.

- **Aquatic Biodiversity Theme**

The screening tool identifies the area for the proposed development footprint as a low sensitivity for the Aquatic Biodiversity theme. The EAP can confirm that the site is not located near any aquatic features.

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



Figure 11: Aquatic Biodiversity Sensitivity

- **Archaeological and Cultural Heritage Theme**

The screening tool identifies the area for the proposed development footprint as a very high sensitivity for the Archaeological and cultural heritage theme. The proposed development footprint is within an area with heritage sites in the following categories:

Grade I: Heritage resources with qualities so exceptional that they are of special national significance; and

Grade II: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region.

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



Figure 13: Civil Aviation Theme

The proposed waste management activities will be conducted on the existing infrastructure on site and will not pose a risk or cause any disturbance to aircraft operations and airport infrastructure as the activities does not cause any radar interference, glint and glare, or environmental noise. The activities will be conducted at an existing building and will therefore have no impact on the civil aviation installations and operations. The site sensitivity is therefore argued to be a low sensitivity.

- **Relative Defence Theme**

The screening tool identifies the area for the proposed development footprint as a low sensitivity for the Relative Defence theme.

MAP OF RELATIVE DEFENCE THEME SENSITIVITY



Figure 14: Relative defence theme

- **Palaeontology Theme**

The screening tool identifies the area for the proposed development footprint as a low sensitivity for the Palaeontology theme.

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



Figure 15: Palaeontology Theme

- **Plant Species Theme**

The screening tool identifies the area for the proposed development footprint as a low sensitivity for the Plant Species theme.

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Figure 16: Plant Species Theme

2.2 On-site inspection

A site visit was conducted on the 05th of November 2025. The site is confirmed to have been completely transformed, the vegetation that is found at the site has been previously disturbed. The proposed waste management activities will not expand the site's footprint into an undisturbed area. The site verification therefore confirmed the findings made in the desktop analysis, that the site is already disturbed and does not possess the environmental sensitivities that the screening tool has identified.

3. OUTCOMES OF THE SITE VERIFICATION

Based on the desktop analysis and the onsite inspection, it can be concluded that the proposed development footprint does not possess the Environmental Sensitivity as identified by the Screening Tool. It is however recommended that:

- The findings of the specialist studies be incorporated into the EMPr.
- The facility implements the measures contained in the EMPr.

Annexure G-1

Biodiversity Impact Assessment Report



November 2025

TERRESTRIAL BIODIVERSITY, AQUATIC
BIODIVERSITY, PLANT AND ANIMAL
SPECIES COMPLIANCE STATEMENT
FOR REVIVE AFRICA, GAUTENG
PROVINCE

FOR A WASTE MANAGEMENT LICENSE
APPLICATION

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List of abbreviations	
CBA	Critical Biodiversity Areas
CR	Critically Endangered
CSIR	Council for Scientific and Industrial Research
DFFE	Department of Forestry, Fisheries and the Environment
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EN	Endangered
ESA	Ecological Support Areas
GDARD	Gauteng Department of Agriculture and Rural Development
IBA	Important Bird Areas
LC	Least Concern
NEMA	National Environmental Management Act
NEMBA	National Environmental Management: Biodiversity Act
NFEPA	National Freshwater Ecosystem Protected Areas
NPAES	National Protected Area Expansion Strategy
NT	Near Threatened
NWM5	National Wetland Map 5
PA	Protected Areas
SACNASP	South Africa Council for Natural Scientific Professions
SANBI	South African National Biodiversity Institute
SCC	Species of Conservation Concern
VU	Vulnerable

1 INTRODUCTION

Excellence Ecology has been appointed by CF Africa Trading (Pty) Ltd, trading as Revive Africa, to undertake a biodiversity assessment in support of the Waste Management Licence Application for waste management activities at their facility in Johannesburg.

1.1 PROJECT DESCRIPTION

CF Africa Trading (Pty) Ltd, trading as Revive Africa, currently operates a small-scale e-waste trading, storage, and dismantling facility at 24–26 Laub Street, New Centre, Johannesburg. Established in 2014, the company focused on collecting and exporting empty printer cartridges through a corporate collection programme and has since expanded into broader e-waste recycling. Since 2020, the company has collected over 434,593 laser cartridges and 982,404 ink units, keeping them out of landfill. In April 2022, Revive Africa began trading printed circuit boards (PCBs) and collected a total of 96,306 kilograms to date. PCBs are recovered from e-waste materials such as cell phones, computers, copiers, laptops, printers, servers, and telecommunications equipment. This initiative also led to the establishment of dedicated dismantling stations for the manual decontamination of the PCBs. Manual decontamination of e-waste also known as manual dismantling or depollution, involves the careful, non-destructive disassembly of electronic equipment by hand using tools such as screw drivers, hammers etc. to remove hazardous substances and separate materials for recycling. This process is crucial to isolate toxic components (like mercury, lead, and cadmium) from high-value materials (gold, copper, plastics), enhancing safety and recovery rates. The facility soon realized that many of the devices they dismantle contained lithium-ion batteries (LIBs) and began a pilot project for discharging and recycling LIBs into black mass that is traded to upstream vendors for further metal extraction.

Revive Africa plans to establish a full-scale e-waste recycling facility comprising a PCB Recycling Plant and a Lithium-Ion Battery Recycling Plant. This project aims to process materials locally, create employment, and contribute to sustainable resource recovery in South Africa. The proposed recycling facility entails increasing the volumes of e-waste accepted, as well as expanding their footprint to the adjacent buildings in 29-32 Laub Street, New Centre Johannesburg. The proposed services for the e-waste management processes include recycling, treatment and recovery of e-waste and LIBs

1.2 TERMS OF REFERENCE

Site sensitivity verification undertaken through the use of:

- a desktop analysis, using satellite imagery;
- a preliminary on-site inspection; and
- any other available and relevant information

If the sensitivity is Low a **Terrestrial Biodiversity** Compliance Statement is needed, which must include:

- 1) The contact details of the specialist, their SACNASP registration number, their field of expertise and a Curriculum Vitae (Appendix A);
- 2) A signed statement of independence by the specialist (Appendix A);
- 3) A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment (Section 1.3);

- 4) A baseline profile description of biodiversity and ecosystems of the site (Section 4 and 5);
- 5) The methodology used to verify the sensitivities of the terrestrial biodiversity features on the site, including equipment and modelling used, where relevant (Section 3);
- 6) In the case of a linear activity, confirmation from the terrestrial biodiversity specialist that, in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase;
- 7) Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPR;
- 8) A description of the assumptions made and any uncertainties or gaps in knowledge or data (Section 1.3); and
- 9) Any conditions to which this statement is subjected.

If the sensitivity is Low an **Aquatic Biodiversity** Compliance Statement is needed, which must include:

- 1) The contact details of the specialist, their SACNASP registration number, their field of expertise and a Curriculum Vitae (Appendix A);
- 2) A signed statement of independence by the specialist (Appendix A);
- 3) A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment (Section 1.3);
- 4) A baseline profile description of biodiversity and ecosystems of the site (Section 4 and 5);
- 5) The methodology used to verify the sensitivities of the aquatic biodiversity features on the site including the equipment and modelling used where relevant (Section 3);
- 6) In the case of a linear activity, confirmation from the aquatic biodiversity specialist that, in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase;
- 7) Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPR;
- 8) A description of the assumptions made and any uncertainties or gaps in knowledge or data (Section 1.3); and
- 9) Any conditions to which this statement is subjected.

If the sensitivity is Low a **Plant Species** Compliance Statement is needed, which must include:

- 1) The contact details of the specialist, their SACNASP registration number, their field of expertise and a Curriculum Vitae (Appendix A);
- 2) A signed statement of independence by the specialist (Appendix A);
- 3) A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment (Section 1.3);
- 4) A baseline profile description of biodiversity and ecosystems of the site (Section 3 and 4);
- 5) A description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant (Section 2);
- 6) In the case of a linear activity, confirmation from the aquatic biodiversity specialist that, in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase (N/A);
- 7) Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPR (N/A);

- 8) A description of the assumptions made and any uncertainties or gaps in knowledge or data (Section 1.3);
- 9) The mean density of observations/ number of samples sites per unit area; and
- 10) Any conditions to which this statement is subjected (N/A).

If the sensitivity is Low an **Animal Species** Compliance Statement is needed, which must include:

- 1) The contact details of the specialist, their SACNASP registration number, their field of expertise and a Curriculum Vitae (Appendix A);
- 2) A signed statement of independence by the specialist (Appendix A);
- 3) A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment (Section 1.3);
- 4) A description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant (Section 2);
- 5) The mean density of observations/ number of samples sites per unit area;
- 6) Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPR;
- 7) A description of the assumptions made and any uncertainties or gaps in knowledge or data (Section 1.3); and
- 8) Any conditions to which this statement is subjected.

1.3 ASSUMPTIONS AND LIMITATIONS

- A site visit was conducted in the wet season, in November 2025, which is in summer. The season of the site visit will not have any effect on the outcome of the survey, as there is no natural vegetation in the project area.

1.4 INFORMATION SOURCES

The following information sources were obtained:

1. Relevant maps through GIS mapping, and information on the natural environment of the area concerned.
2. Legislation pertaining to the fauna and flora study as relevant.
3. The vegetation of South Africa, Lesotho and Swaziland (Mucina and Rutherford, 2006).
4. Red data species lists from the South African National Biodiversity Institute (SANBI).
5. Gauteng Conservation Plan V4 (C-Plan 4) (2024).
6. Wetland databases: National Fresh Water Priority Areas and National Wetland Map Version 6.

1.5 EIA SCREENING TOOL

According to the national web-based environmental screening tool in terms of National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), the site has the following sensitivities:

Terrestrial Biodiversity Theme Sensitivity (Figure 1): **Very high**

Reason: Located in the Vulnerable Soweto Highveld Grassland.

Aquatic Biodiversity Theme Sensitivity (Figure 2): Low

Reason: No aquatic features present in project area.

Plant Species Theme Sensitivity (Figure 3): Low

Reason: No plant Species of Conservation Concern (SCC) likely to be present.

Animal Species Theme Sensitivity (Figure 4): Medium

Reason: Five fauna SCC may be present in the project area.

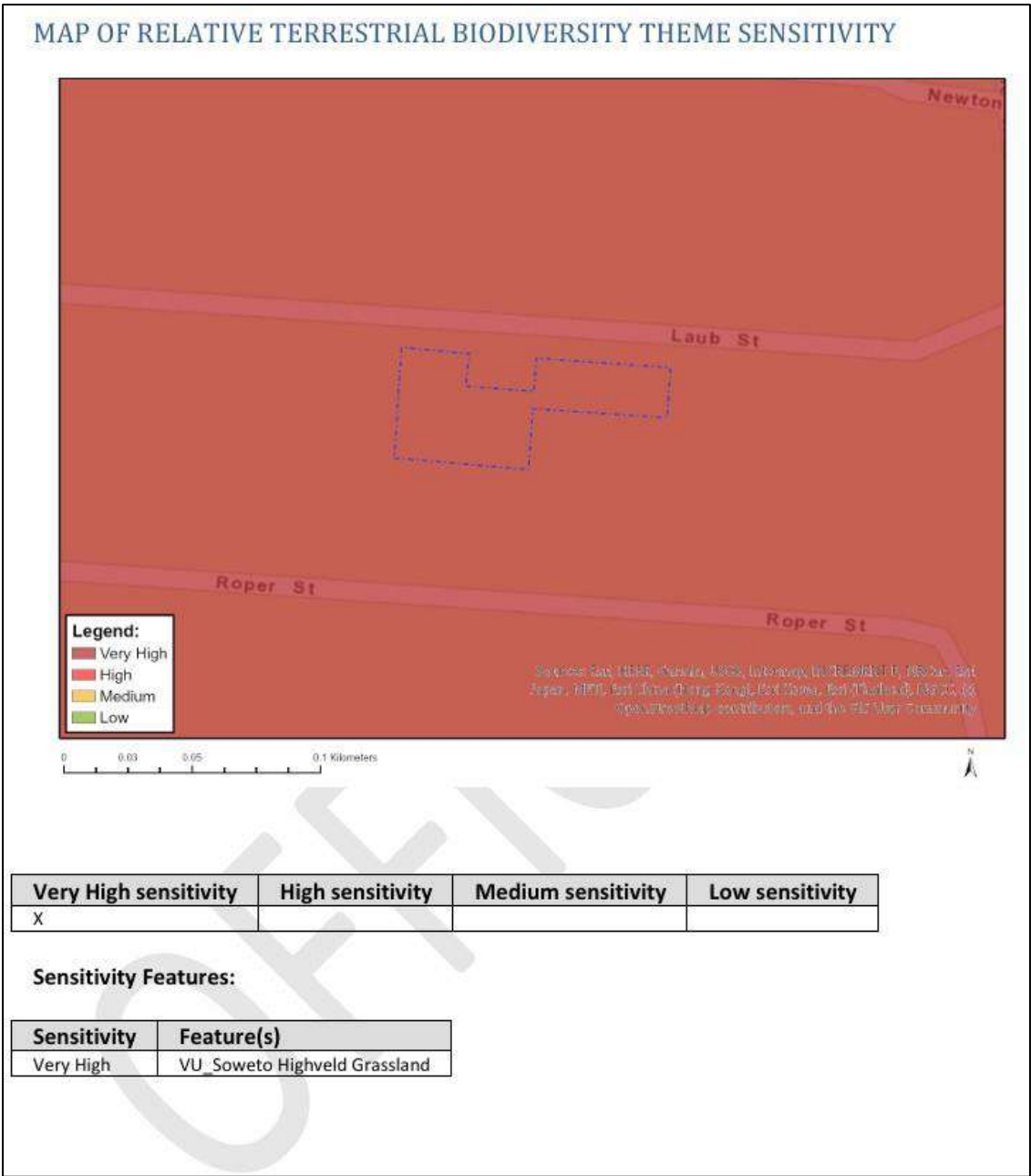


Figure 1: Terrestrial biodiversity theme sensitivity according to the Screening Tool

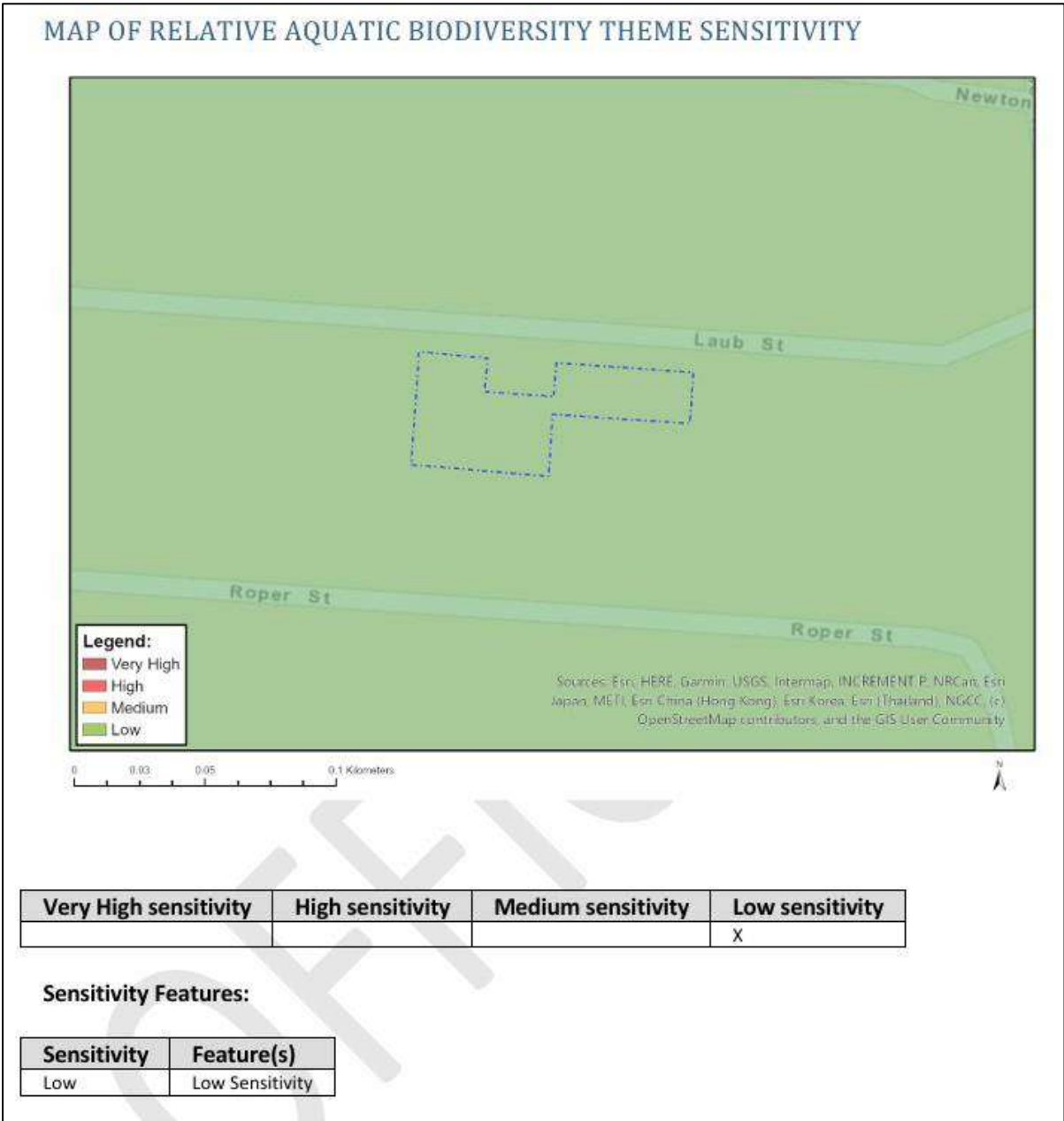


Figure 2: Aquatic biodiversity theme sensitivity according to the Screening Tool

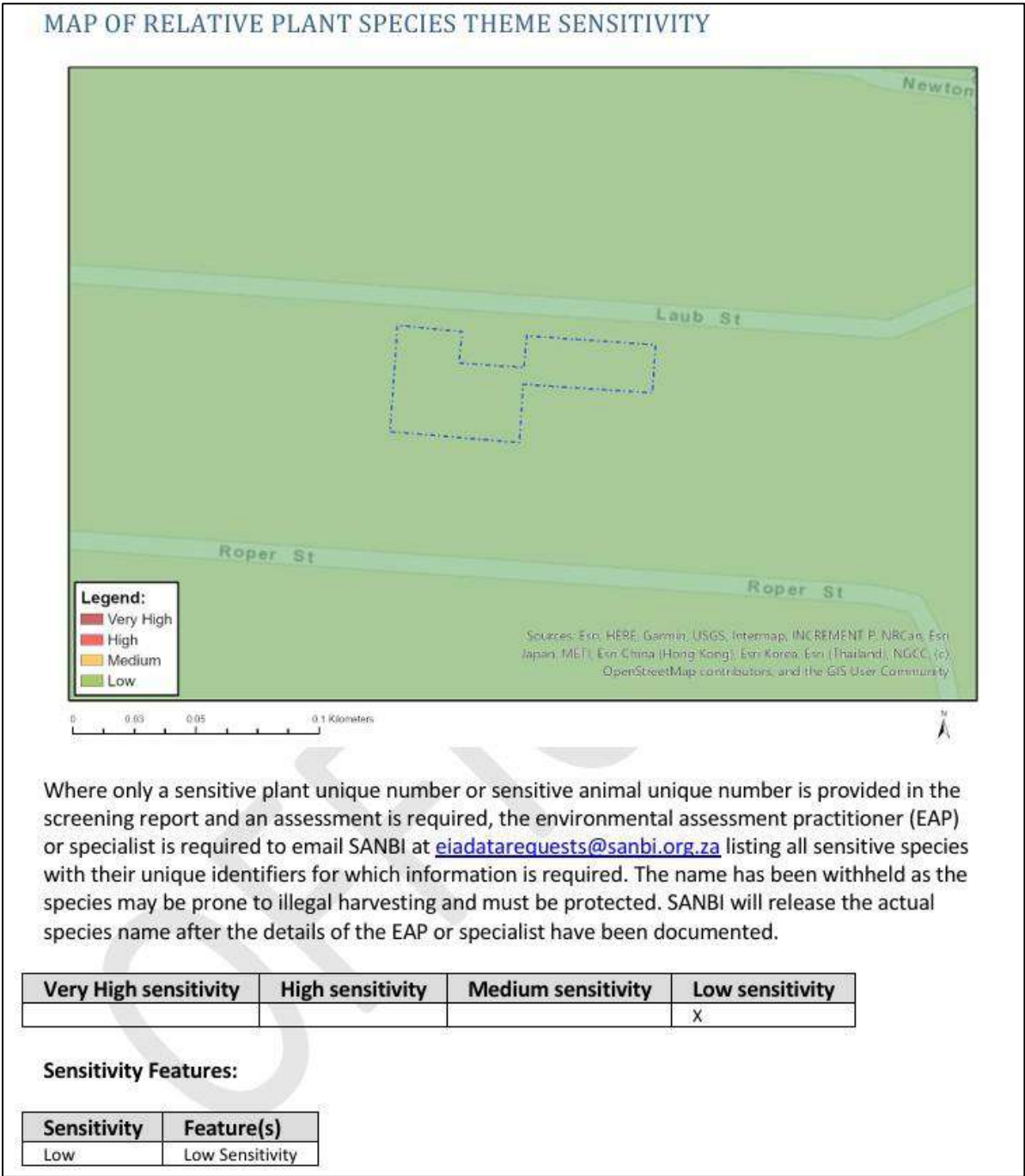


Figure 3: Plant species theme sensitivity according to the Screening Tool

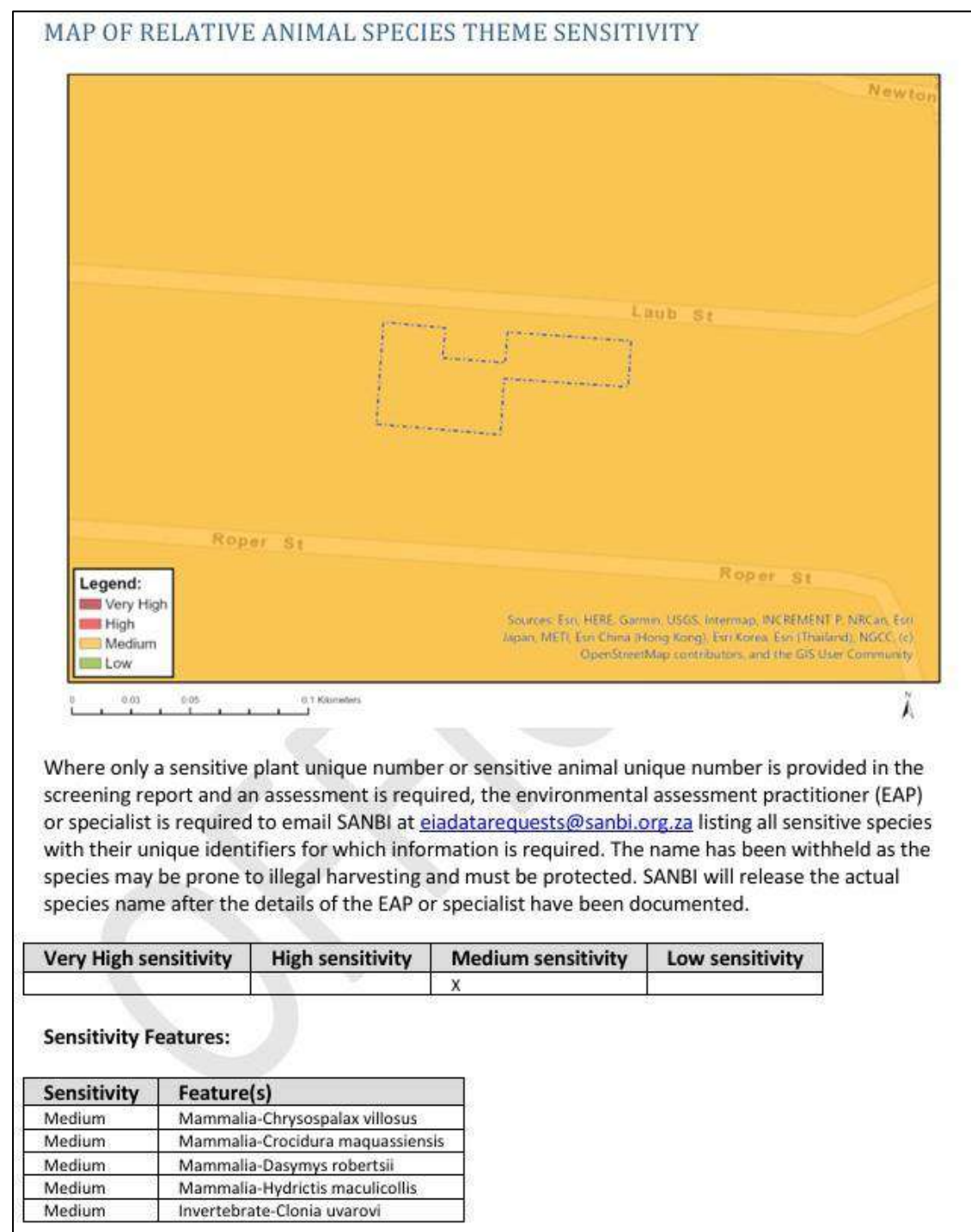


Figure 4: Animal species theme sensitivity according to the Screening Tool

2 METHODS

2.1 DESKTOP SURVEY

A desktop survey was completed to determine whether the project area is located in any sensitive areas, like Critical Biodiversity Areas (CBA), Ecological Support Areas (ESA), National Freshwater Ecosystem Priority Areas (NFEPAs), Important Bird Areas (IBA), Nationally Threatened Ecosystems etc. Climate and vegetation were also discussed for the project area.

2.2 SITE VISIT

The EAP conducted a site visit on the 5th of November 2025 to verify the sensitivity. Land use and general condition of the site was noted. Sensitive features were assessed. Habitat types that may be present in the project area were assessed. Photos of the project area was taken.

2.3 REPORTING

A baseline profile description of the terrestrial and aquatic biodiversity and plant and animal SCC of the site is given with maps and photos.

3 BACKGROUND TO THE STUDY AREA

3.1 LOCATION

The project area is at 24-26 Laub Street, New Centre Johannesburg, Gauteng Province.

3.2 CLIMATE

The climate of Johannesburg is mild, generally warm, and temperate, with dry winters and warm summers. The average annual temperature in Johannesburg is approximately 15.9 °C, while the mean annual rainfall is around 784 mm. Rainfall is highly seasonal, with the majority occurring during the summer months from December to March (Climate-data.org, 2025).

3.3 VEGETATION

South Africa has been recognized as having remarkable plant diversity with high levels of endemism. South Africa hosts a wide range of ecosystems, including nine biomes, namely the Fynbos, Succulent Karoo, Desert, Nama-Karoo, Grassland, Savanna, Albany Thicket, Indian Ocean Coastal Belt and Forest Biomes (Mucina & Rutherford, 2006). The project area is situated in the Grassland biome (Mucina & Rutherford, 2006), which is characterised by herbaceous vegetation of relatively short and simple structure that is dominated by graminoids, usually of the family Poaceae. Woody plants are rare (usually low to medium-sized shrubs) or absent or are confined to specific habitats, such as smaller escarpments or koppies. Core grassland areas usually have deep, fertile soils although a wide spectrum of soil types occurs. Precipitation is strongly seasonal, and the growing season lasts approximately half the year (Mucina & Rutherford, 2006).

The project area overlaps the Soweto Highveld Grassland vegetation unit (Figure 5) (Mucina et al., 2018). The Soweto Highveld Grassland vegetation unit is characterised as gently to moderately undulating landscape on the Highveld plateau, supporting short to medium-high, dense, tufted grassland dominated almost entirely by *Themeda triandra* and accompanied by a variety of other grasses such as *Elionurus muticus*, *Eragrostis racemosa*, *Heteropogon contortus* and *Tristachya leucothrix*. In places not disturbed, only scattered small wetlands, narrow stream alluvia, pans and occasional ridges or rocky outcrops interrupt the continuous grassland cover. The National Biodiversity Assessment lists this vegetation unit as **Vulnerable**, and the protection level is **Not protected** (SANBI, 2018).

3.4 WATER MANAGEMENT AREAS AND QUATERNARY CATCHMENT

The project area is located in the Vaal-Orange Water Management Area (WMA) and the C22B Quaternary Catchment.

3.5 SENSITIVITY ANALYSIS AND CONSERVATION ANALYSIS TOOLS

There are several assessments for South Africa as a whole, as well as on provincial levels that allow for detailed conservation planning as well as meeting biodiversity targets for the country's variety of ecosystems. These guides are essential to consult for development projects and will form an important part of the sensitivity analysis. Areas earmarked for conservation in the future, or that are essential to meet biodiversity and conservation targets should not be developed and have a high sensitivity as they are necessary for overall functioning. In addition, sensitivity analysis in the field based on much finer scale data can be used to ground truth the larger scale assessments and put it into a more localised context.

3.5.1 Critical Biodiversity Areas and Ecological Support Areas

Critical Biodiversity Areas (CBA) are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan. Ecological Support Areas (ESA) are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. Critical Biodiversity Areas and Ecological Support Areas may be terrestrial or aquatic.

The primary purpose of a map of Critical Biodiversity Areas and Ecological Support Areas is to guide decision-making about where best to locate development. It should inform land-use planning, environmental assessment and authorisations, and natural resource management, by a range of sectors whose policies and decisions impact on biodiversity. It is the biodiversity sector's input into multi-sectoral planning and decision-making processes (SANBI Biodiversity Advisor, 2017).

The project area is not located in a Critical Biodiversity or Ecological Support Area (Figure 6) (GDARD, 2024).

3.5.2 Important Bird Areas (Key Biodiversity Areas)

Important Bird Areas (IBAs) are sites of global significance for bird conservation (Marnewick *et al.*, 2015). The project area is not located in or close to an Important Bird Area.

3.5.3 Protected Areas (PA) and National Protected Area Expansion Strategy (NPAES)

Officially protected areas, either Provincially or Nationally that occur close to a project site could have consequences as far as impacts on these areas are concerned. The National Protected Area Expansion Strategy (NPAES) sets targets for protected area expansion, provides maps of the most important areas for protected area expansion, and makes recommendations on mechanisms for protected area expansion.

The project area is not located in or close to a protected area. It is not located in a NPAES focus area, but there is a NPAES focus area approximately 1 560 m southwest of the project area. The proposed development will not have an impact on protected areas or NPAES focus areas.

3.5.4 Nationally threatened ecosystems

The Biodiversity Act (Act 10 of 2004) provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to preserve witness sites of exceptionally high conservation value.

The list of Threatened Ecosystems was published in 2011 (SANBI, 2011). This dataset has been refined and replaced by the Red List of Ecosystems (RLE) for terrestrial realm for South Africa – remnants (2022). This dataset contains the current remaining natural extent (circa 2018) of each of the 458 ecosystem types assessed. This means that those portions of ecosystems that have been lost to anthropogenic activities such as mining or croplands are excluded and only the remnants are part of the dataset (SANBI, 2022).

The project area is located in the Vulnerable Soweto Highveld Grassland (SANBI, 2021) (Figure 8).

3.6 NATIONAL FRESHWATER ECOSYSTEM PRIORITY AREAS (NFEPAs) AND NATIONAL WETLAND MAP 5

South Africa's freshwater ecosystems are diverse, ranging from sub-tropical in the north-eastern part of the country, to semi-arid and arid in the interior, to the cool and temperate rivers of the fynbos. "Freshwater ecosystems" refer to all inland water bodies whether fresh or saline, including rivers, lakes, wetlands, sub-surface waters and estuaries. Consistent with global trends, high levels of threat have been reported for freshwater ecosystems. According to the National Biodiversity Assessment 2018 nearly 80% of inland wetland ecosystem types in South Africa are threatened and approximately 75% of inland wetland ecosystem types are both threatened and under-protected (SANBI, 2019). South Africa's freshwater fauna also displays high levels of threat: at least one third of freshwater fish indigenous to South Africa are reported as threatened, and a recent southern African study on the conservation status of major freshwater-dependent taxonomic groups (fishes, molluscs, dragonflies, crabs and vascular plants) reported far higher levels of threat in South Africa than in the rest of the region.

Urgent attention is needed to ensure that we conserve some representative natural examples of the different ecosystems that make up the natural heritage of this country for current and future generations. NFEPAs respond to this need, providing strategic spatial priorities for conserving South Africa's freshwater ecosystems and supporting sustainable use of water resources (Driver *et al.*, 2011)

The National Wetland Map version 5 (NWM5) shows the distribution of inland wetland ecosystem types across South Africa and includes estuaries and the extent of some rivers (CSIR, 2018).

There are no NWM 6 wetlands in or close to the proposed project area, however there is a small NFEPAs wetland roughly 800 m from the project area (Figure 9).

3.7 STRATEGIC WATER SOURCE AREAS

Water source areas are those areas that supply a disproportionate amount of mean annual runoff to a geographical region of interest. Strategic water source areas (SWSA) are those that supply substantial downstream economies and urban centres. These water source areas are vital to the national economy (Nel *et al.*, 2013).

The project area is not located in a SWSA.

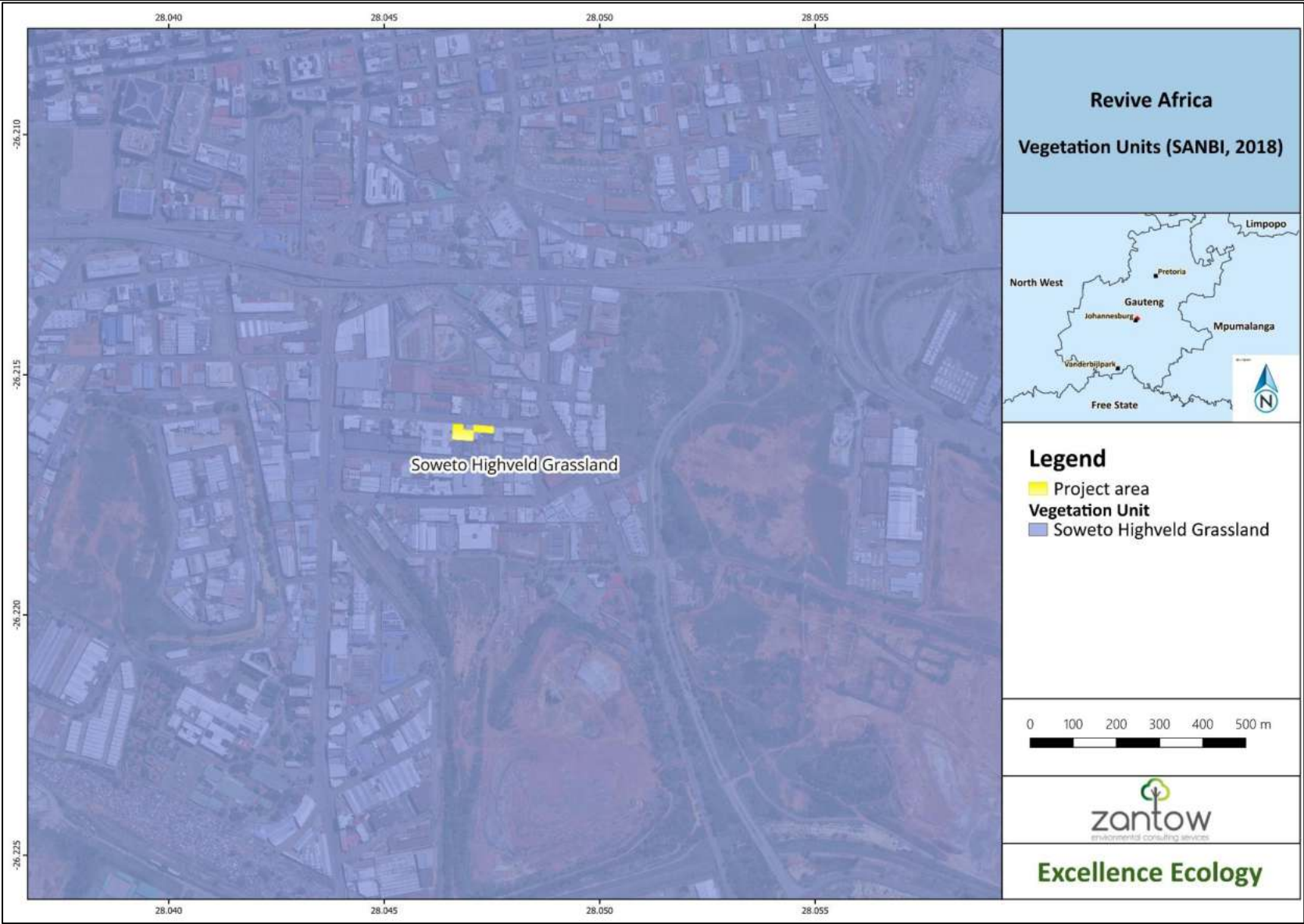


Figure 5: Vegetation Units (SANBI 2018)

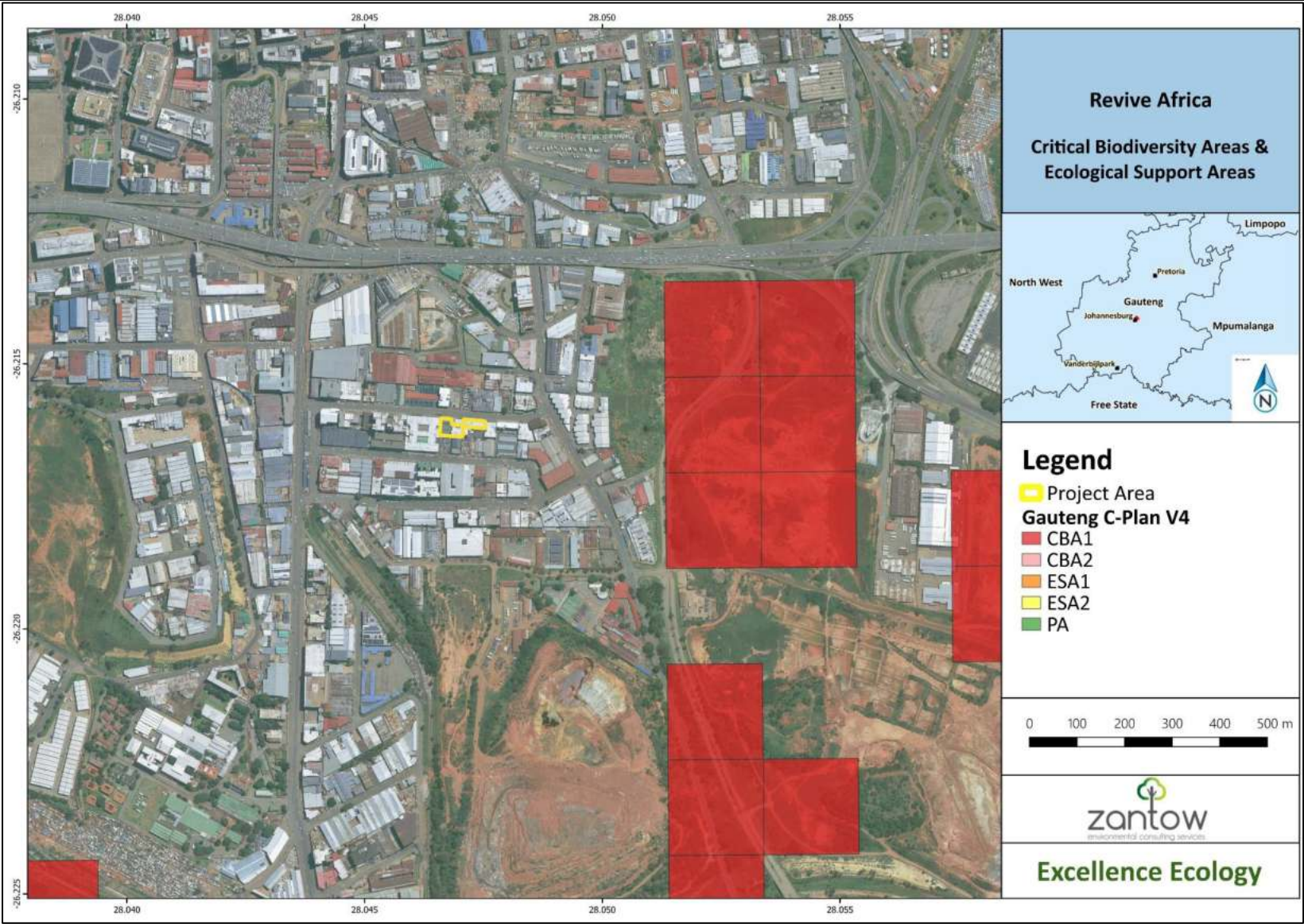


Figure 6: Critical Biodiversity Areas and Ecological Support Areas (GDARD, 2024)

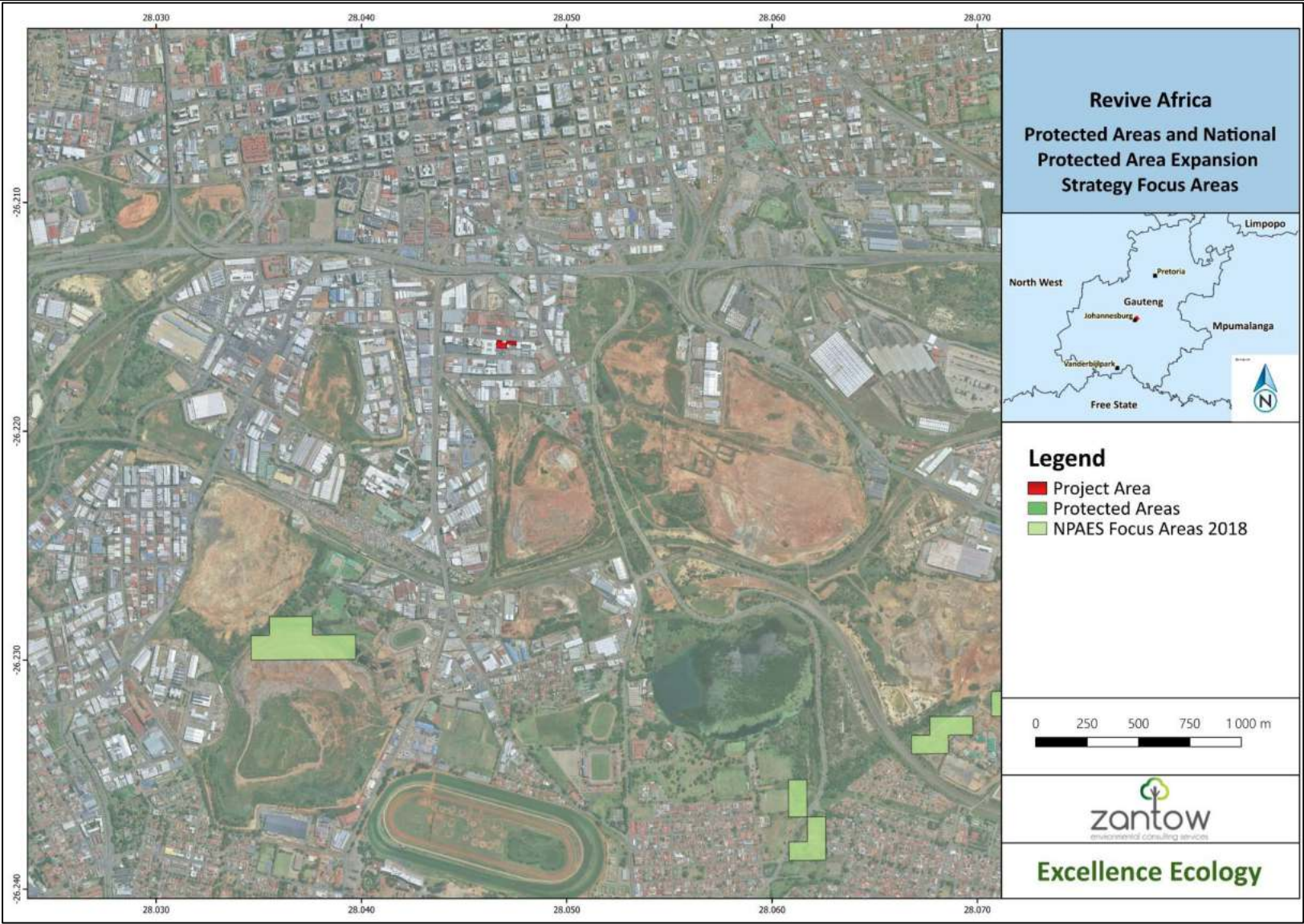


Figure 7: Protected Areas and Protected Areas Expansion Strategy areas

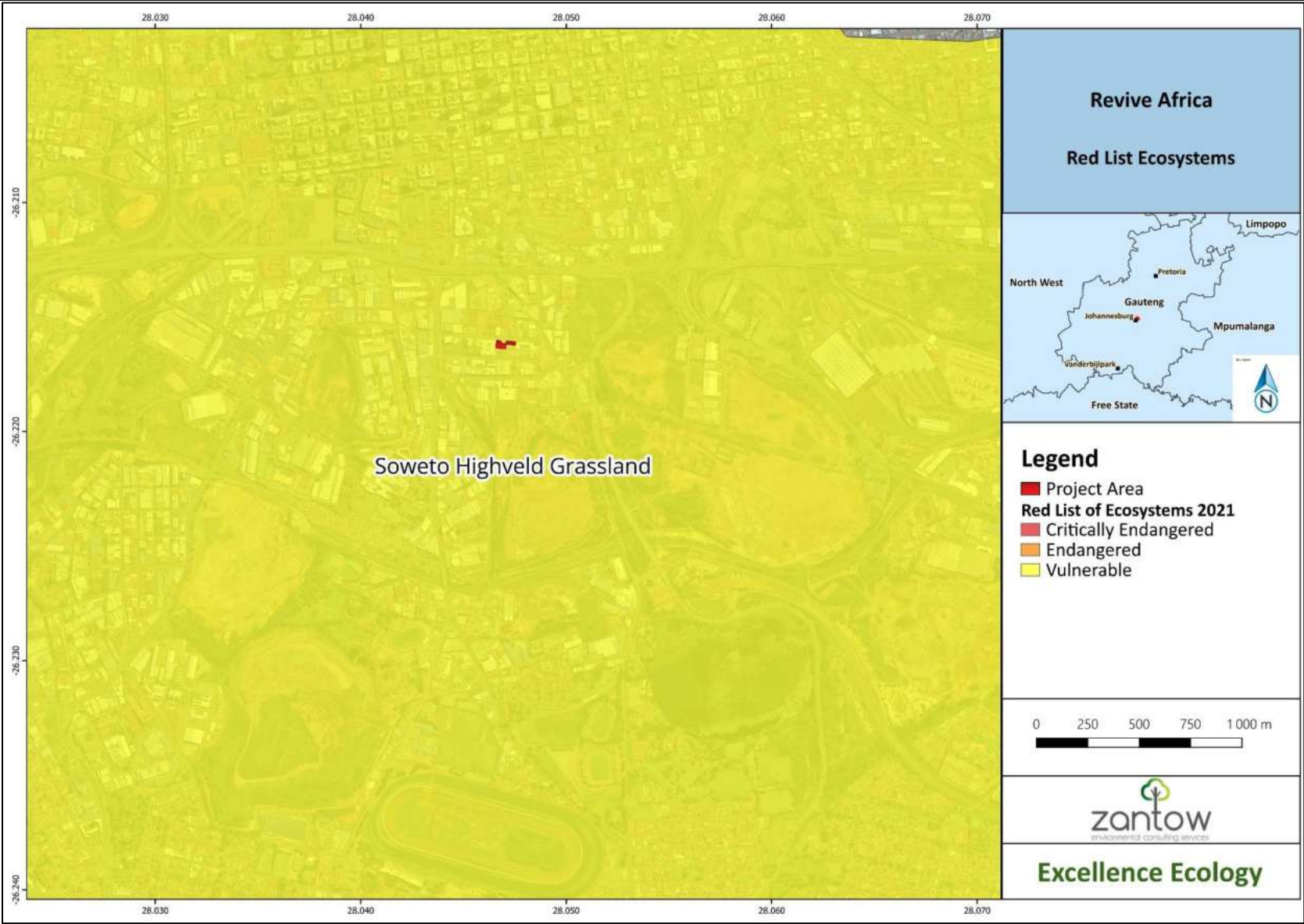


Figure 8: Red List of Ecosystems 2021

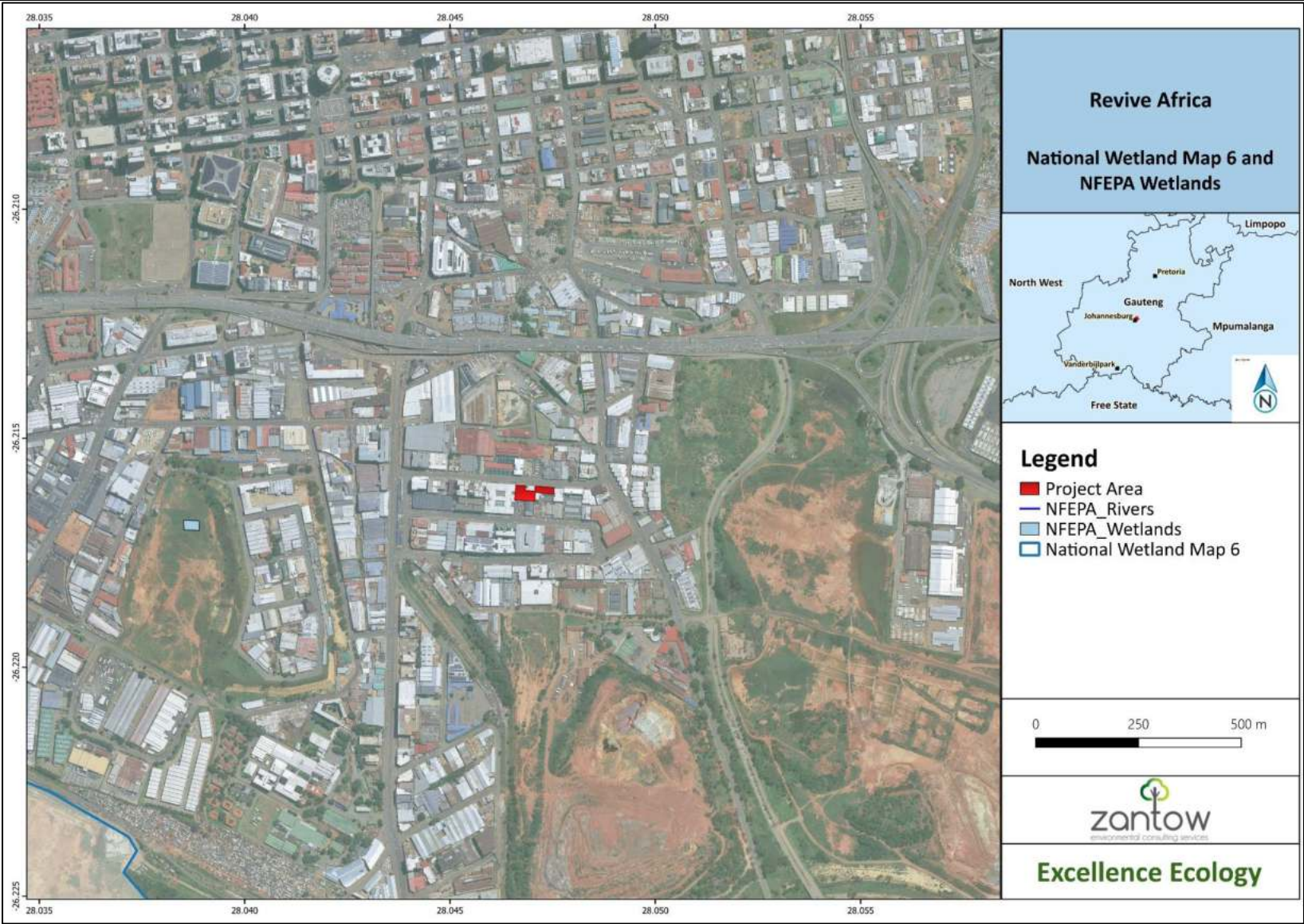


Figure 9: National Freshwater Ecosystem Priority Areas (NFEPAs) and National Wetland Map 5

4 RESULTS

4.1 LANDUSE AND VEGETATION

The project area has been fully developed as a small-scale electronic waste (e-waste) trading, storage, and dismantling facility. The site consists of warehouse buildings, loading bays, and paved service areas, with no remaining undeveloped or natural portions. No natural vegetation or grassland is present within the project footprint. The area does not support any wetlands, drainage lines, rivers, or dams, and there is no habitat suitable for Species of Conservation Concern.



Figure 10: Google Earth image of project area



Figure 11: Warehouse



Figure 12: Loading bay



Figure 13: Parking area

4.2 PROTECTED TREES

No protected tree species were recorded.

4.3 EIA SCREENING TOOL LISTED SPECIES (SCC)

The Screening Tool identified four mammal species and one invertebrate species of Conservation Concern (SCC) (Table 1), with no plant SCC potentially occurring within the project area. However, none of these species were recorded during the site visit, nor are they expected to occur on-site. The project area is fully developed, comprising warehouse buildings and paved surfaces, and therefore does not provide suitable habitat to support any of the identified SCC.

Table 1: Screening Tool fauna SCC and presence of suitable habitat in the project area

Scientific name	English name	Red list category	Habitat	Habitat present in project area
<i>Chrysospalax villosus</i>	Rough-haired Golden Mole	VU	Sandy soils in grasslands, meadows and along edges of marshes in Savannah and Grassland biomes (Child <i>et al.</i> , 2016)	No
<i>Crocidura maquassiensis</i>	Maquassie Musk Shrew	VU	It may tolerate a wide range of habitats, including urban and rural landscapes.	No
<i>Dasymys robertsii</i>	African Marsh Rat	VU	These species have been recorded from a wide variety of habitats, including forest and savannah, swampland and grasslands, but they rely on intact wetlands in these areas.	No
<i>Hydricotis maculicollis</i>	Spotted-necked Otter	VU	Spotted-necked Otters are thought to inhabit freshwater habitats where water is not silt-laden, and is unpolluted, and rich in small fishes (Perrin & Carugati 2000a; d'Inzillo Carranza & Rowe-Rowe 2013). However, anecdotal observations suggest they can occur, and can be common, in relatively polluted rivers. Adequate riparian vegetation, in the form of long grass, reeds, or bushes, is also essential to provide cover.	No
<i>Clonia uvarovi</i>	Uvarov's Clonia	VU	This species inhabits tall woodland savannah.	No

5 DISCUSSION & CONCLUSION

Excellence Ecology was appointed by Zantow Environmental Consulting Services (acting on behalf of the applicant: CF Africa Trading (Pty) Ltd, trading as Revive Africa, to undertake a biodiversity assessment for the Waste Management Licence Application underway for the waste management activities at their facility in Johannesburg.

The desktop survey indicates that:

- The project area is not located in a Critical Biodiversity or Ecological Support Area.
- The project area is not located in or close to a protected area.
- The project area is not located in or close to a protected area. It is not located in a NPAES focus area, but there is a NPAES focus area approximately 1 560 m southwest of the project area. The proposed development will not have an impact on protected areas or NPAES focus areas.
- The project area is located in the Vulnerable Soweto Highveld Grassland.
- The project area is located in the Vaal-Orange Water Management Area (WMA) and the C22B Quaternary Catchment.
- There are no NWM 6 wetlands in or close to the proposed project area, however there is a small NFEPA wetland roughly 800 m from the project area.

According to the national web-based environmental screening tool in terms of National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), the site has a very high sensitivity from a Terrestrial Biodiversity Theme Perspective. This is due to the fact that the project area is located in the Vulnerable Soweto Highveld Grassland. The Site Sensitivity Verification proved otherwise. The Very High sensitivity is disputed as there is no natural vegetation remaining in the project area. The sensitivity is therefore low for the terrestrial biodiversity theme.

The project area has been fully developed as a small-scale electronic waste (e-waste) trading, storage, and dismantling facility. The site consists of warehouse buildings, loading bays, and paved service areas, with no remaining undeveloped or natural portions. No natural vegetation or grassland is present within the project footprint. The area does not support any wetlands, drainage lines, rivers, or dams, and there is no habitat suitable for Species of Conservation Concern.

As there are no wetlands, drainage lines, rivers or dams in the project area, the screening tool gave a low sensitivity for the aquatic biodiversity theme. The site visit confirmed this.

The Screening Tool identified four mammal species and one invertebrate species of Conservation Concern (SCC), with no plant SCC potentially occurring within the project area. However, none of these species were recorded during the site visit, nor are they expected to occur on-site. The project area is fully developed, comprising warehouse buildings and paved surfaces, and therefore does not provide suitable habitat to support any of the identified SCC. See Table 2 for summary of the Screening Tool sensitivities.

No declared invader plant species were recorded.

Table 2: Assessment of Screening Tool sensitivities

Theme	DFFE Screening Tool Report Sensitivity	Specialist Sensitivity	Rating Confirmed/ disputed	Reasons
Terrestrial Biodiversity	Very high	Low	Disputed	The project area is developed and there is no natural vegetation remaining. It is not representative of the vegetation units it is located in.
Aquatic Biodiversity	Low	Low	Confirmed	There are no wetlands or rivers in the project areas.
Plant Species	Low	Low	Confirmed	There is no suitable habitat for plant SCC in the project area.
Animal Species	Medium	Low	Disputed	There is no suitable habitat for animal SCC in the project area.

No sensitive features were recorded, so no sensitive features / species will be affected during the proposed development. The areas surrounding the project areas is also very disturbed and not sensitive. The development can be approved from an aquatic and terrestrial biodiversity perspective and also from a plant and animal species perspective.

6 REFERENCES

- Child, M.F., Roxburgh, L., Do Linh San, E., Raimondo, D. & Davies-Mostert, H.T. 2016. The 2016 Mammal Red List of South Africa Lesotho and Swaziland. Endangered Wildlife Trust & South African National Biodiversity Institute (SANBI).
- Climate-data.org. 2025. <https://en.climate-data.org/africa/south-africa/gauteng/johannesburg-3221/>. Date of access: 10 November 2025
- Council for Scientific and Industrial Research (CSIR). 2018. National Wetland Map 5 and Confidence Map [Vector] 2018. Available from the Biodiversity GIS website, downloaded on 28 July 2022
- Council for Scientific and Industrial Research. 2011. NFEPA rivers [vector geospatial dataset] 2011. Available from the Biodiversity GIS website, downloaded on 19 April 2021
- Department of Water and Sanitation. 2016a. General Authorisation in terms of Section 39 of the National Water Act, 1998 (act no. 36 of 1998) for water uses as defined in Section 21(c) or Section 21(l). Notice 509 of 2016.
- Driver, A., Nel, J.L., Snaddon, K., Murray, K., Roux, D.J., Hill, L., Swartz, E.R., Manuel, J. & Funke, N. 2011. Implementation Manual for Freshwater Ecosystem Priority Areas. South African National Biodiversity Institute, CSIR, The Freshwater Consulting Group, Water Research Commission, South African National Parks & South African Institute for Aquatic Biodiversity.
- Gauteng Department of Agriculture and Rural Development. 2024 Gauteng CBA Map [Vector] 2024. Available from the Biodiversity GIS website, downloaded on Thursday, March 27, 2025
- Gauteng Department of Agriculture and Rural Development (GDARD). 2014. GDARD Requirements for Biodiversity Assessments Version 3.
- Government of South Africa. 2010. National protected area expansion strategy for South Africa 2008. Priorities for expanding the protected area network for ecological sustainability and climate change adaptation. Pretoria, South Africa: The Government of South Africa.
- Marnewick M.D., Retief E.F., Wright D.R., Theron N.T. 2015. South Africa's Important Bird and Biodiversity Areas Status Report 2015. Johannesburg: BirdLife South Africa.
- Mucina, L. & Rutherford, M.C. (eds). 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. Pretoria: South African National Biodiversity Institute.
- Nel, J.L., Colvin, C., Le Maitre, D.C., Smith, J. & Haines, I. 2013. South Africa's Strategic Water Source Areas. CSIR Report CSIR/NRE/ECOS/ER/2013/0031/A, CSIR, Stellenbosch, South Africa.
- Nel, J.L., Driver, A., Strydom, W.F., Maherry, A., Petersen, C., Hill, L., Roux, D.J., Nienaber, S., Van Deventer, H., Swartz, E. & Smith-Adao, L.B. 2011. Atlas of Freshwater Ecosystem Priority Areas in South Africa: Maps to support sustainable development of water resources. Water Research Commission Report No. TT 500/11.
- SANBI Biodiversity Advisor. 2017. Critical Biodiversity Areas and Ecological Support Areas. <http://biodiversityadvisor.sanbi.org/industry-and-conservation/biodiversity-in-the-urban-economy/understand/definitions-related-to-urban-land-use-planning/critical-biodiversity-areas-and-ecological-support-areas/> Date of access: 17 July 2022.
- South Africa. 1998. National Environmental Management Act 107 of 1998.
- South Africa. 1998. National Water Act 36 of 1998.
- South Africa. 1998. The National Forest Act 84 of 1998. Notice of the list of protected tree species (Updated 2022).

- South Africa. 2005. National Environmental Management: Biodiversity Act no 10 of 2004: Draft lists of threatened and protected species, 2005.
- South Africa. 2009. National Environmental Management: Biodiversity Act no 10 of 2004.
- South Africa. 2016. National Environmental Management: Biodiversity Act no 10 of 2004. Alien and invasive species lists, 2020.
- South African National Biodiversity Institute (SANBI). 2010. Red list of South African Plants. <http://redlist.sanbi.org/> Date of access: 1 Jul 2024.
- South African National Biodiversity Institute (SANBI). 2011. National List of Threatened Ecosystems [vector geospatial dataset]. Available from the Biodiversity GIS website, downloaded on 1 April 2023
- South African National Biodiversity Institute (SANBI). 2018. The Vegetation Map of South Africa, Lesotho and Swaziland, Mucina, L., Rutherford, M.C. and Powrie, L.W. (Editors), Online, <http://bgis.sanbi.org/Projects/Detail/186>, Version 2018.
- South African National Biodiversity Institute (SANBI). 2019. National Biodiversity Assessment 2018: The status of South Africa's ecosystems and biodiversity. Synthesis Report. South African National Biodiversity Institute, an entity of the Department of Environment, Forestry and Fisheries, Pretoria
- Taylor, M.R., Peacock, F. & Wanless, R.M. 2015. The 2015 Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland. Johannesburg: BirdLife South Africa.
- Water Research Commission. 2017. Surface and Groundwater Strategic Water Source Areas (SWSA) [Vector] 2017. Available from the Biodiversity GIS website, downloaded on 13 June 2022.

APPENDIX A: Specialist CV and Declaration of Independance

CURRICULUM VITAE

Mari van der Westhuizen

(M.Sc. Environmental Sciences, Professional Natural Scientist: Ecological Science)

PERSONAL DETAILS

Name:	Mari van der Westhuizen
Maiden name:	La Grange
Nationality:	South African
Date of birth:	26 October 1985
E-mail address:	mariwesthuizen@gmail.com
Cell phone number:	+27 82 257 1715
Identity number:	851026 0045 083

KEY QUALIFICATION

M. Sc. Environmental Sciences (2010)
B.Sc. Honours in Ecological Remediation and Sustainable Usage (2007)
B. Sc. with Microbiology and Botany at the North West University, Potchefstroom Campus (2006)

AWARDS AND PRIZES

Best Second year Microbiology student (2005)
Best M.Sc. in Botany (2010)

SHORT COURSES COMPLETED

Wetland Legislation (2024) WetRest
Track and Sign Workshop (2023) Motsumi Bush Courses
Tools for Wetland Assessment (2015) Rhodes University
Landscape Function Analysis course (2010) North West University
Multivariate Statistics course (CANOCO) (2009) University of Kwazulu-Natal

MEMBERSHIP WITH PROFESSIONAL BODIES AND ASSOCIATIONS

Registered as a Professional Natural Scientist in Ecological Science at the South African Council for Natural Scientific Professions (SACNASP), with registration number 400166/15.
South African Association of Botanists (SAAB).

KEY RELEVANT EXPERIENCE

12 years' experience:

- Biodiversity, plant and animal species impact assessments for Environmental Authorisations (Environmental Impact Assessments).
- Wetland assessments for EIA's and WULA's.
- Wetland Rehabilitation Plans.
- Protected tree counts and protected tree license applications.
- Declared invader surveys.
- GIS mapping and data processing (ArcGIS and QGIS).
- Writing and reviewing scientific reports.
- Mentoring junior ecologists.

DECLARATION OF INDEPENDENCE

I, Mari van der Westhuizen, hereby confirm my independence as a specialist and declare that I do not have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which I was appointed as ecologist in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for work performed, specifically in connection with the terrestrial biodiversity, aquatic biodiversity, plant and animal species compliance statement for the environmental authorisation for Rhenus Logistics, Gauteng Province, for the proposed storage of hazardous goods.



Full Name: Mari van der Westhuizen

Title / Position: Ecologist

Qualification(s): B.Sc. in Botany and Microbiology (2006) North West University;

B.Sc. Honours in Ecological Remediation and Sustainable Usage (2007) North West University;

M.Sc in Environmental Sciences (2010) North West University

Experience (years): 12

Registration(s): SACNASP (Pri.Sci.Nat. # 400166/15 – Ecological Science)

Phone no: 082 257 1715 Email: mari@excellence-ecology.co.za

APPENDIX A: Specialist CV and Declaration of Independence

CURRICULUM VITAE

Elandrie Davoren

(Ph.D. Environmental Sciences, Junior Ecologist)

PERSONAL DETAILS

Name:	Elandrie Davoren
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Nationality:	South African
Date of birth:	26 October 1985
E-mail address:	elandriedavoren@yahoo.com
Cell phone number:	+27 83 283 0106
Identity number:	851026 0079 082

KEY QUALIFICATION

Ph.D. Environmental Science (2017)
M. Sc. Environmental Sciences (2010)
B.Sc. Honours in Urban Ecology (2007)
B. Sc. with Botany and Zoology at the North West University, Potchefstroom Campus (2006)

AWARDS AND PRIZES

Best M.Sc. in Botany (2010)

SHORT COURSES COMPLETED

Practical Implementation of Environmental Auditing and Monitoring (2024) Business Success Solutions
Track and Sign Workshop (2023) Motsumi Bush Courses

MEMBERSHIP WITH PROFESSIONAL BODIES AND ASSOCIATIONS

South African Association of Botanists (SAAB).

KEY RELEVANT EXPERIENCE

4 years' experience:

- Biodiversity, plant and animal species impact assessments for Environmental Authorizations (Environmental Impact Assessments).
- Wetland assessments for WULA's.
- Declared invader surveys.
- GIS mapping and data processing (ArcGIS and QGIS).
- Writing and reviewing scientific reports.

DECLARATION OF INDEPENDENCE

I, Elandrie Davoren, hereby confirm my independence as a specialist and declare that I do not have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which I was appointed as ecologist in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for work performed, specifically in connection with the terrestrial biodiversity, aquatic biodiversity, plant and animal species compliance statement for the environmental authorisation for Rhenus Logistics, Gauteng Province, for the proposed storage of hazardous goods.



Full Name: Elandrie Davoren

Title / Position: Junior Ecologist

Qualification(s): B.Sc. in Botany and Zoology (2006) North West University;

B.Sc. Honours in Urban Ecology (2007) North West University;

M.Sc in Environmental Sciences (2010) North West University

Ph.D. Environmental Science (2017) North West University

Experience (years): 4

Phone no: 083 283 0106 Email: elandriedavoren@yahoo.com

Annexure G-2

Heritage Study Compliance Statement

**ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME
STATEMENT IN SUPPORT OF A WASTE MANAGEMENT LICENCE
APPLICATION FOR THE PROPOSED HAZARDOUS WASTE (E-
WASTE) RECYCLING, RECOVERY AND TREATMENT FACILITY
AT REVIVE AFRICA,
LOCATED IN
NEW CENTRE, JOHANNESBURG, GAUTENG**



Report Number: 4057-ZANREV-2025

Report Date: 15th November 2025

General Information	
Report Name:	Archaeological And Cultural Heritage Theme Statement in Support of A Waste Management Licence Application for the Proposed Hazardous Waste (E-Waste) Recycling, Recovery and Treatment Facility at Revive Africa, Located in New Centre, Johannesburg, Gauteng.
Site Visit Date:	05 th November 2025
Report Date:	15 th November 2025
Environmental Consultant	Zantow Environmental Consulting Services CC Colosseum Building 1 st Floor, Unit 2 Cnr Delius Street & Chopin Street Vanderbijlpark, 1911 PO Box 3858 Vanderbijlpark, 1911 Contact Person: Karien Zantow Tel: 083 384 3641 Fax: 016 932 4976 Email: karien@zantow.co.za
Client:	CF Africa Trading Pty Ltd t/a Revive Africa 24 Laub Street New Centre Johannesburg South Africa 2001 Contact Person: Fergus Slattery Tel: 011 493 5700 Cell: 081 747 2326 Email: fergus@reviveafrica.co.za
Report Compiled by:	Karien Zantow
SACNASP Registration:	400114/14
EAPASA Registration:	2019/1871
Report Nr:	4057-ZANREV-2025

DECLARATION AND REVIEW

I, **Karien Zantow** as an independent consultant and specialist compiled this report and declare that it correctly reflects the results and findings made during the site visit and assessment. I further declare that;

- I act as an independent specialist in terms of the associated application
 - I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
 - I declare that there are no circumstances that may compromise my objectivity in performing such work;
 - I have expertise in conducting the specialist report relevant to the application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
 - I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in conflicting interests in the undertaking of the activity;
I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority
All the particulars furnished by me in this report are true and correct; and
I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of Section 24F of the Act.



Karien Zantow
SACNASP Reg Nr 400114/14
EAPASA Reg Nr 2019/1871

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INTRODUCTION AND BACKGROUND

CF Africa Trading Pty (Ltd), trading as Revive Africa, currently operates a small-scale e-waste trading, storage and dismantling facility located at 24-26 Laub Street, New Centre Johannesburg. The company began operations in 2014 as a trader of empty printer cartridges that are collected through a corporate collections program.

Revive Africa stores and prepare the cartridges prior to exporting them to upstream vendors for recycling. Since its inception, Revive Africa has expanded its operations into broader e-waste recycling. Since 2020, the company has collected over 434,593 laser cartridges and 982,404 ink units, keeping them out of landfill.

In April 2022, Revive Africa began trading printed circuit boards (PCBs) and collected a total of 96,306 kilograms to date. PCBs are recovered from e-waste materials such as cell phones, computers, copiers, laptops, printers, servers, and telecommunications equipment. This initiative also led to the establishment of dedicated dismantling stations for the manual decontamination of the PCBs. Manual decontamination of e-waste also known as manual dismantling or depollution, involves the careful, non-destructive disassembly of electronic equipment by hand using tools such as screw drivers, hammers etc. to remove hazardous substances and separate materials for recycling. This process is crucial to isolate toxic components (like mercury, lead, and cadmium) from high-value materials (gold, copper, plastics), enhancing safety and recovery rates. The facility soon realized that many of the devices they dismantle contained lithium-ion batteries (LIBs) and began a pilot project for discharging and recycling LIBs into black mass that is traded to upstream vendors for further metal extraction. (*Existing Recycling, recovery and or treatment, below the threshold of the WML requirements*).



Current storage, sorting and receiving



Current manual depopulation of e-waste and battery recycling

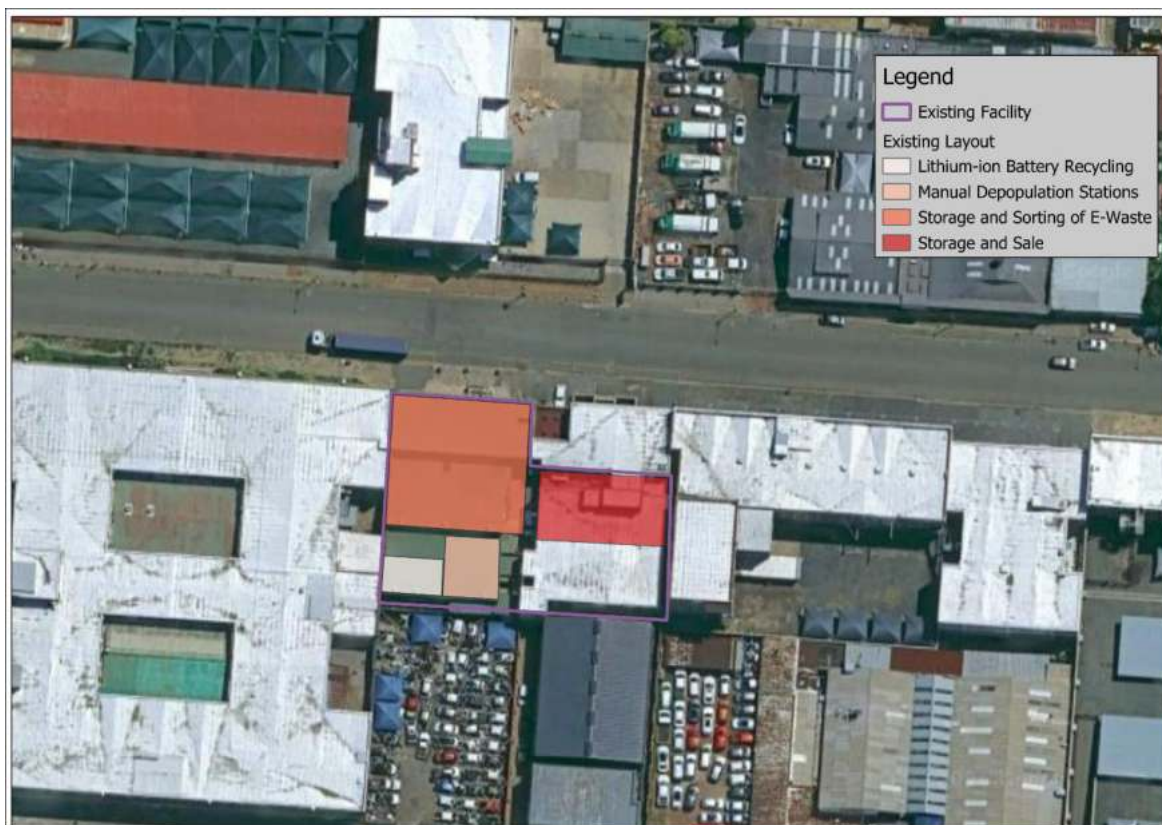


Figure 1: Revive Africa Facility 24-26 Laub Street (Existing facility layout).

Revive Africa plans to establish a full-scale e-waste recycling facility comprising a PCB Recycling Plant and a Lithium-Ion Battery Recycling Plant. This project aims to process materials locally, create employment, and contribute to sustainable resource recovery in South Africa.

The proposed recycling facility entails increasing the volumes of e-waste accepted, as well as expanding their footprint to the adjacent buildings in 29-32 Laub Street, New Center Johannesburg. The proposed services for the e-waste management processes include recycling, treatment and recovery of e-waste and LIBs.

The planned PCB recycling facility will cover 1,800 m², dedicated to e-waste storage, dismantling, and processing. The plant will be capable of processing 40-50 tons of PCBs per month and is expected to create at least 15 new jobs, depending on volume. PCBs will be collected, graded, shredded and sold to upstream vendors for further processes.

The battery recycling facility will occupy approximately 900 m², for battery storage, discharging, shredding, and screening. It will have the capacity to process up to four (4) tons of lithium-ion batteries per day. The process involves discharging batteries, shredding them into granulate, and screening the granulate to separate the black mass from plastic and copper residues. Comprehensive environmental and safety controls will be implemented to manage VOCs, fluorinated gases, and particulate emissions to ensure safe operations.

Zantow Environmental Consulting Services CC (Zantow Environmental) has been appointed by Revive Africa as an Independent Environmental Assessment Practitioner (EAP) to facilitate the application process to obtain the required environmental authorisation.

As part of the application process, the National Web based Environmental Screening Tool (<https://screening.environment.gov.za/screeningtool/>) was used to generate a Screening Tool Report. The Screening Tool Report thus indicated that the proposed site for the waste management activities

has a very high sensitivity for the Archaeological and Cultural Heritage theme. In addition, the report recommends the specialist studies that must be undertaken and submitted with the application.

The “*Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation*” (“the Protocols”), clearly states that “prior to commencing with a specialist assessment, the current use of the land and environmental sensitivity of the site under consideration, identified by the screening tool, must be confirmed by undertaking a site sensitivity verification.

The said verification was undertaken by Zantow Environmental Consulting Services (Zantow Environmental), and it was confirmed that the site selected for the proposed waste management activities has very high Archaeological and Heritage resources. However, the project itself would not impact on any of the resources identified.

Using existing information, desktop assessments and the site visit, this Compliance Statement was compiled in line with the requirements set out in the Protocol for the specialist assessment and minimum report content requirements for Environmental Impacts on Archaeological and Cultural Heritage.

1. DATA LIMITATIONS AND STUDY GAPS

Assumptions and conclusions made in terms of this compliance statement are based on the data and historic information provided to the specialist as part of application process.

Data and information obtained by means of the desktop assessment and associated specialist assessments (as provided) were deemed accurate and correct.

2. METHODOLOGY

To determine the potential of Archaeological and Cultural Heritage resources of the selected area for the proposed waste management activities, a site visit and desktop assessment was conducted.

The desktop study involved a review of the South African Heritage Resources Information System (SAHRIS), published literature, historical maps, and aerial imagery to identify any previously recorded archaeological or cultural heritage resources within or near the site. This was complemented by a site visit, during which the project footprint and its surroundings were systematically inspected for any visible heritage resources.

3. SITE VISIT

A site visit was undertaken on the 5th of November 2025. Site photos taken during the site visit are included in this report. Based on the findings of the site visit it was found that the area selected for the proposed waste management activities has a low to negligible archaeological and cultural heritage resource potential.

The area has been previously developed, and no archaeological or cultural heritage resources were identified during construction or are currently present. The proposed area selected for the waste management activities will be located within the boundary of an already disturbed industrial and commercially zoned area. The proposed development will therefore have no impact on the archaeological and cultural heritage resources.



Figure 2. Revive Africa (existing operation) building



Figure 3. Proposed building for increasing processing capacity.



Figure 4. Paved parking area behind building



Figure 5. Cemented surfaces inside building.



Figure 6. Electrical scrap storage containers.



Figure 7. Grading bins.



Figure 8. Scale



Figure 9. Work benches



Figure 10. Processed LIB materials.



Figure 11. Processed materials (black mass).



Figure 12. Toner storage.



Figure 13. Printer and toner storage.

4. GEOLOGY

Revive Africa falls within the Siliciclastic lithological class (Fig.13). Siliciclastic rocks, which comprise siltstone, sandstone, and conglomerate, are the second most abundant sedimentary rock type after mudrocks. These rocks are largely formed by the accumulation and consolidation of mineral grains, primarily silicate minerals, and are important reservoirs for water, oil, and natural gas. They also function as storage facilities for valuable minerals like diamonds and gold, making them economically significant.

Three major material types make up siliciclastic rocks: cement, matrix, and framework grains. The majority of a siliciclastic rock is often composed of framework grains, which are mineral particles or tiny pieces of other rocks. The matrix is a very fine-grained substance, like clay, that is deposited concurrently with the framework grains. Any substance that precipitates in the voids, or pores, between the grains of a rock or sediment is called cement. Cement is a secondary deposit since it precipitates in pores after the source material, while framework grains and matrix are primary deposits.

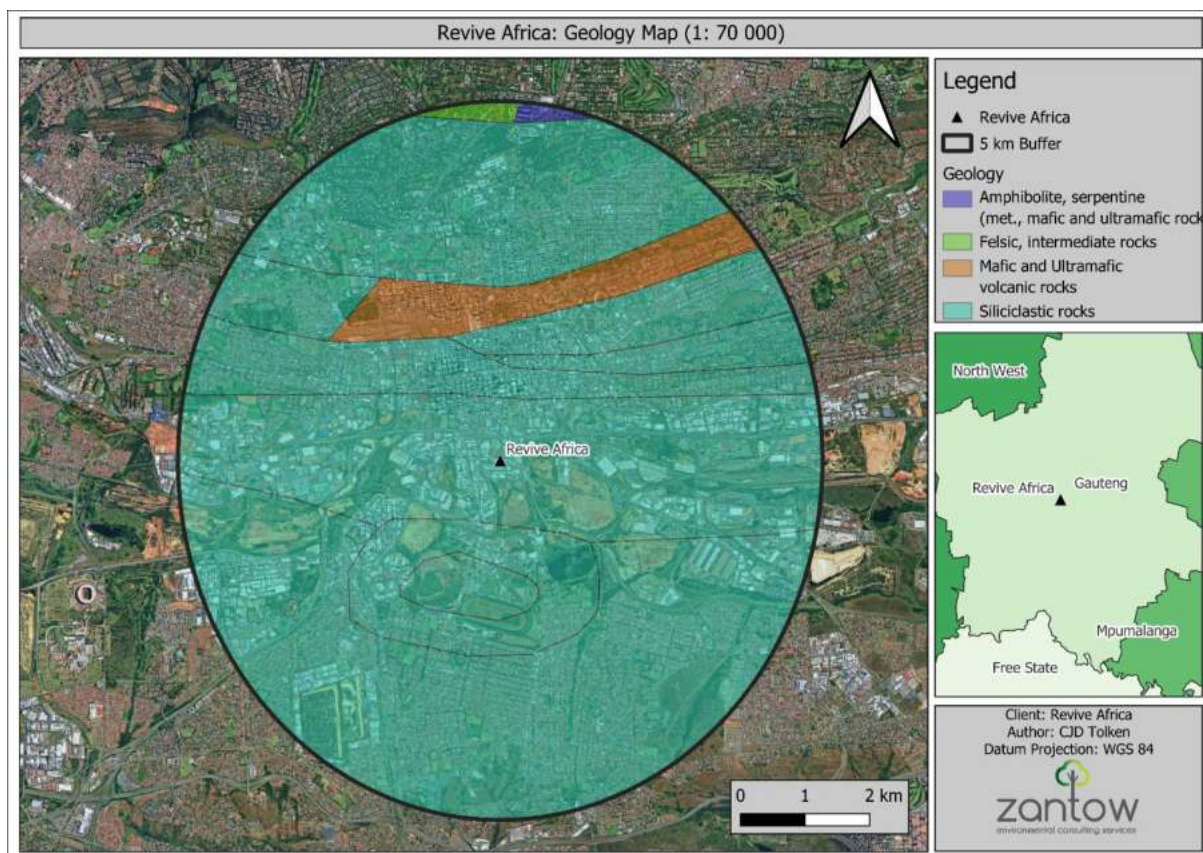


Figure 14. Geology of the area surrounding Revive Africa

Stone tools are the most direct application of siliciclastic rock in archaeology. Certain varieties, like chert (or flint), are microcrystalline silica that break predictably, which makes them perfect for knapping (shaping) into tools with sharp edges, including blades and arrowheads. These tools are frequently well preserved in archaeological excavations due to the durability of quartz, the predominant mineral.

5. GRADE I HERITAGE SITE: CONSTITUTION HILL HUMAN RIGHTS PRECINCT

The Constitution Hill Human Rights Precinct located in Johannesburg, approximately 3 km from Revive Africa, is a national heritage site with rich history dating back more than a century. After opening in 1893

and closing in 1983, the precinct underwent renovations in the late 1990s and early 2000s to become the museum it is today. The Constitutional Court first convened at Constitution Hill in 2004.

Additionally, Constitution Hill is a site of contrasts: oppression and emancipation, injustice and justice. The precinct is proof of the significance of both conserving atrocity sites for future generations and reconstructing them to fulfil current needs and shape the future.



Figure 15: Old Fort

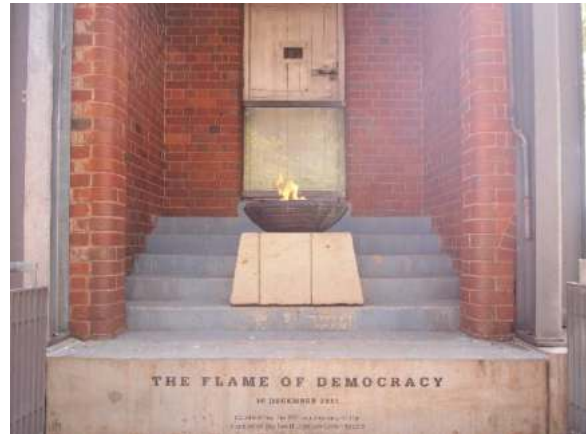


Figure 16: The Flame of Democracy



Figure 17: Number Four



Figure 18: Constitutional Court

4. GRADE II HERITAGE SITES

Buildings or neighbourhoods of notable architectural or aesthetic value are classified as Grade II heritage sites, although their significance is local or regional rather than national. These locations are regarded as local landmarks that add to the uniqueness of a region and are safeguarded by provincial or local authorities.

Grade II Sites within 2 km of Revive Africa:

- Poswohl Synagogue: believed to be the only memorial anywhere in the world to the Jews of Poswohl.
- Cuthberts Building: Cuthberts is a famous structure in Johannesburg that has been designated as a heritage property. It was finished in 1904 and designed by the renowned architectural team of Stucke and Bannister. Once the most sought-after retail address in South Africa, the building is situated on the intersection of Eloff and Pritchard Streets.
- Chancellor House: Offices of Mandela and Tambo attorneys in the 1950s.

- Crown Mines Head Office: Sir Herbert Baker created the office building following the 1909 merger of eight mining businesses. Contained an experimental lab with a noticeable brick chimney.



Figure 19. Poswold Synagogue



Figure 20. Cuthberts Building



Figure 21. Chancellor House

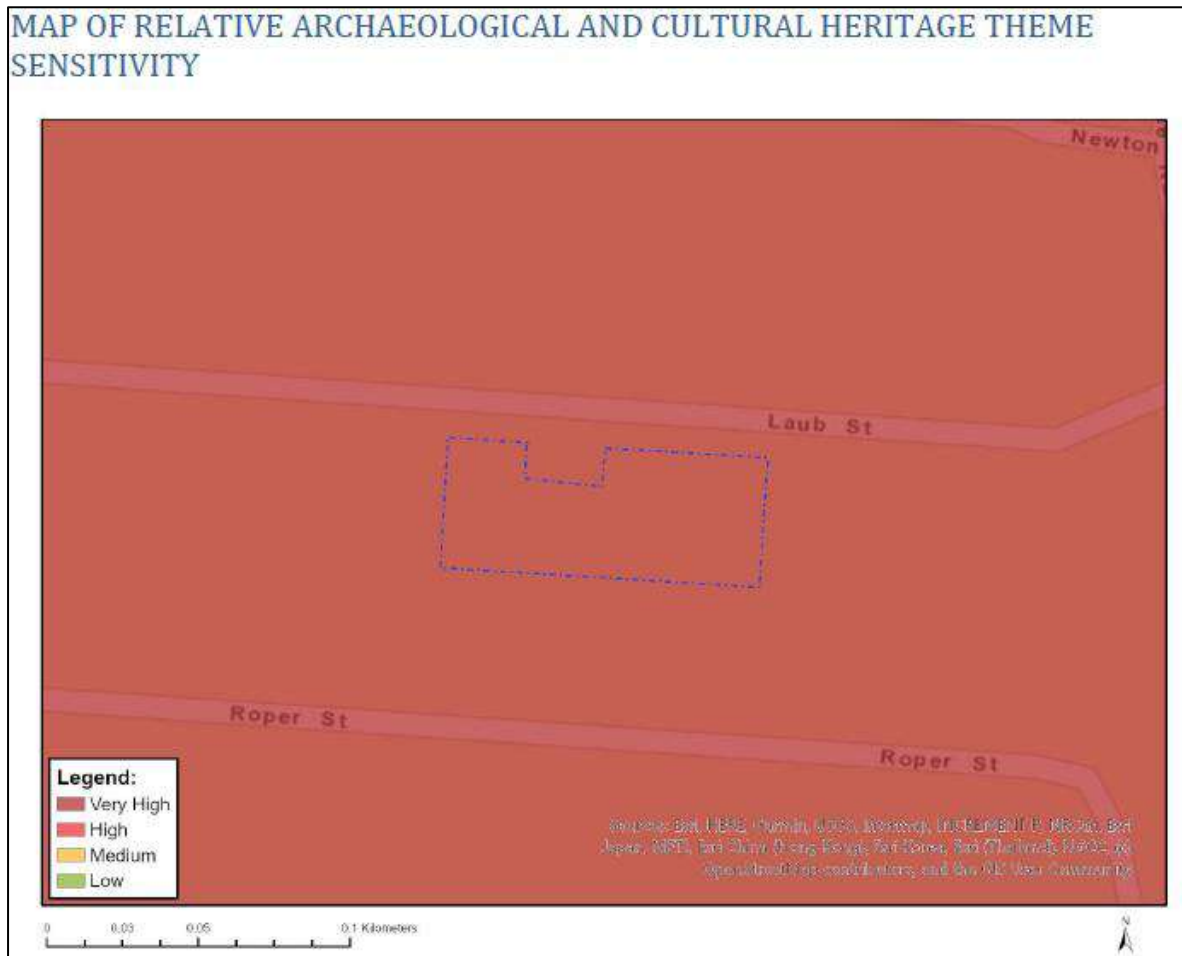


Figure 22. Crown Mines Head Office

6. SCREENING TOOL COMPARISON AND CONCLUSION

According to the National Screening Tool, the site selected for the proposed waste management activities has a **very high sensitivity** for the Archaeological and Cultural Heritage Theme.

The area is given a high sensitivity because of the Grade I Heritage site which is said to be within a 5km buffer and the Grade II Heritage sites which are within a 2km buffer from the proposed site.



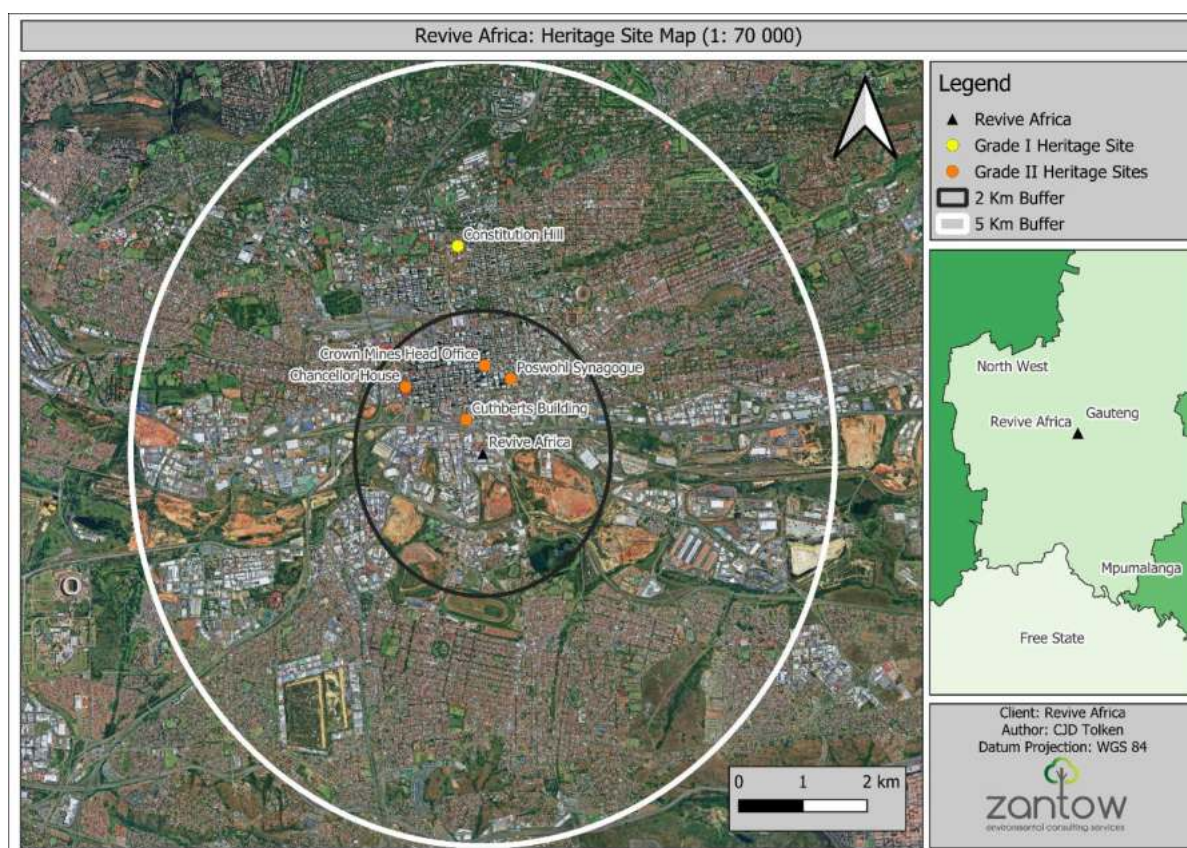


Figure 24. Heritage Site Location Map

Based on the findings of the assessment and available information it was determined that no negative impacts of any nature are expected upon the archaeological and cultural heritage resources. The site in its current state in fact has no very high sensitivity to it.

The area has been previously developed, and no archaeological or cultural heritage resources were identified during construction or are currently present. In addition, the proposed area selected for the waste management activities will be located within the bounds an existing industrial and commercial zoned area. Therefore, the proposed activities will have no impact on the Grade I Heritage site which is said to be approximately 3 km away from the proposed area.

It is in the specialist's opinion that the proposed waste management site is of a **low archaeological and cultural heritage sensitivity** and that the proposed waste management activities will not impact the Grade I Heritage site which is said to be approximately 3 km away from the proposed area. In terms of archaeological and cultural heritage sensitivity, the proposed waste management activities should thus be allowed to proceed at the identified site, subject to recommendations provided.

Conclusion

It is in the specialist's opinion that the proposed site is of a **low archaeological and cultural heritage sensitivity** and that the proposed waste management activities will not impact the Grade I Heritage site which is said to be 5km away from the proposed area.

Recommendations

- Restrict activities to the proposed infrastructure development area.

ANNEXURE A

SPECIALIST CV

Annexure G-3

Civil Aviation Compliance Statement

**CIVIL AVIATION THEME COMPLIANCE STATEMENT IN SUPPORT
OF A
WASTE MANAGEMENT LICENCE APPLICATION FOR THE
PROPOSED HAZARDOUS WASTE (E-WASTE) RECYCLING,
RECOVERY AND TREATMENT FACILITY
AT
CF AFRICA TRADING (PTY) LTD, T/A REVIVE AFRICA.
GAUTENG PROVINCE**



Report Number: 4352-ZANREV-2026

Report Date: 8th July 2026

General Information	
Report Name:	Civil Aviation Theme Compliance Statement in Support of the Waste Management Licence for the Proposed Hazardous Waste (E-Waste) Recycling, Recovery and Treatment Facility at CF Africa t/a Revive Africa Located in New Centre, Johannesburg, Gauteng Province
Site Visit Date:	5 th November 2025 & March 2026
Report Date:	8 th July 2026
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Report Compiled by:	Karien Zantow
SACNASP Registration:	400114/14
EAPASA Registration:	2019/1871
Report Nr:	4352-ZANREV-2026

DECLARATION AND REVIEW

I, **Karien Zantow** as an independent consultant and specialists compiled this report and declare that it correctly reflects the results and findings made during the site visit an assessment. I further declare that;

- I act as an independent specialist in terms of the associated application
 - I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
 - I declare that there are no circumstances that may compromise my objectivity in performing such work;
 - I have expertise in conducting the specialist report relevant to the application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
 - I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in conflicting interests in the undertaking of the activity;
I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority
All the particulars furnished by me in this report are true and correct; and
I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of Section 24F of the Act.



Karien Zantow
Environmental Specialist
SACNASP Reg Nr 400114/14
EAPASA Reg Nr 2019/1871

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INTRODUCTION AND BACKGROUND

CF Africa Trading Pty (Ltd), trading as Revive Africa, currently operates a small-scale e-waste trading, storage and dismantling facility located at 24-26 Laub Street, New Centre Johannesburg. The company began operations in 2014 as a trader of empty printer cartridges that are collected through a corporate collections program.

Revive Africa stores and prepares the cartridges prior to exporting them to upstream vendors for recycling. Since its inception, Revive Africa has expanded its operations into broader e-waste recycling. Since 2020, the company has collected over 434,593 laser cartridges and 982,404 ink units, keeping them out of landfill.

In April 2022, Revive Africa began trading printed circuit boards (PCBs) and collected a total of 96,306 kilograms to date. PCBs are recovered from e-waste materials such as cell phones, computers, copiers, laptops, printers, servers, and telecommunications equipment. This initiative also led to the establishment of dedicated dismantling stations for the manual dismantling and depollution of the PCBs. Manual decontamination of e-waste also known as manual dismantling or depollution, involves the careful, non-destructive disassembly of electronic equipment by hand using tools such as screwdrivers, hammers etc. to remove hazardous substances and separate materials for recycling. This process is crucial to isolate toxic components (like mercury, lead, and cadmium) from high-value materials (gold, copper, plastics), enhancing safety and recovery rates. The facility soon realized that many of the devices they dismantle contained lithium-ion batteries (LIBs) and began a pilot project for discharging and recycling LIBs into black mass that is traded to upstream vendors for further metal extraction. *(Existing Recycling, recovery and or treatment, below the threshold of the WML requirements).*



Current storage, sorting and receiving



Current manual depollution of e-waste and battery recycling



Figure 1: Revive Africa Facility 24-26 Laub Street (Existing facility layout).

Revive Africa plans to establish a full-scale e-waste recycling facility comprising a PCB Recycling Plant and a Lithium-Ion Battery Recycling Plant. This project aims to process materials locally, create employment, and contribute to sustainable resource recovery in South Africa.

The proposed recycling facility entails increasing the volumes of e-waste accepted, as well as expanding their footprint to the adjacent buildings in 29-32 Laub Street, New Center Johannesburg. The proposed services for the e-waste management processes include recycling, treatment and recovery of e-waste and LIBs.

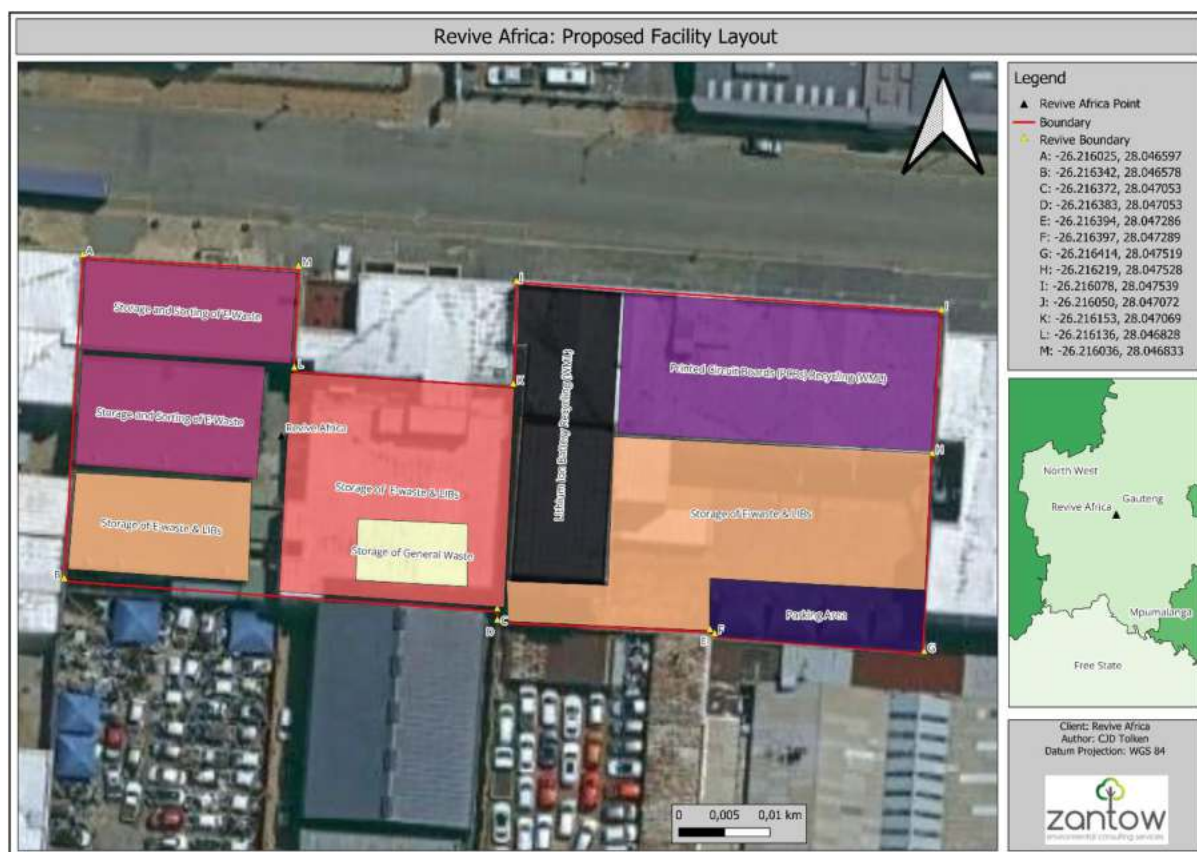


Figure 2: Revive Africa Facility 24-26 & 29-32 Laub Street (Proposed facility layout).

The planned PCB recycling facility will cover 1,800 m², dedicated to e-waste storage, dismantling, and processing. The plant will be capable of processing 40-50 tons of PCBs per month and is expected to create at least 15 new jobs, depending on volume. PCBs will be collected, graded, shredded and sold to upstream vendors for further processes.

The battery recycling facility will occupy approximately 900 m², for battery storage, discharging, shredding, and screening. It will have the capacity to process up to four (4) tons of lithium-ion batteries per day. The process involves discharging batteries, shredding them into granulate, and screening the granulate to separate the black mass from plastic and copper residues. Comprehensive environmental and safety controls will be implemented to manage VOCs, fluorinated gases, and particulate emissions to ensure safe operations.

Zantow Environmental Consulting Services CC (Zantow Environmental) has been appointed by Revive Africa as an Independent Environmental Assessment Practitioner (EAP) to facilitate the application process to obtain the required to facilitate the Waste Management Licence application and associated Scoping and Environmental Impact Reporting process.

As part of the application process, the National Web based Environmental Screening Tool (<https://screening.environment.gov.za/screeningtool/>) was used to generate a Screening Tool Report. The Screening Tool Report thus indicated that the proposed site for the waste management activities has a high sensitivity for the Civil Aviation theme. In addition, the report recommends the specialist studies that must be undertaken and submitted with the application.

The “Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation” (“the Protocols”), clearly states that “prior to

commencing with a specialist assessment, the current use of the land and environmental sensitivity of the site under consideration, identified by the screening tool, must be confirmed by undertaking a site sensitivity verification.

The said verification was undertaken by Zantow Environmental Consulting Services (Zantow Environmental), and it was confirmed that the site selected for the proposed waste management activities are located in close proximity to Civil Aviation Resources. However, the project itself would not have any impact on any of the identified Civil Aviation resources and is therefore anticipated to have **low to negligible effects on Civil Aviation operations**.

Using existing information, desktop assessments and a site visit, this Compliance Statement was compiled in line with the requirements set out in the Protocol for the specialist assessment and minimum report content requirements for Environmental Impacts on Civil Aviation.

1. DATA LIMITATIONS AND STUDY GAPS

Assumptions and conclusions made in terms of this compliance statement are based on the overall site layout and buildings around the site along with the site visit.

The assessment is based on available screening-tool information, mapped aviation datasets, aerial imagery and site observations. No detailed obstacle limitation surface survey, instrument-flight-procedure assessment or quantitative smoke-plume modelling was undertaken. The conclusions are therefore limited to the currently proposed activities within existing buildings and must be reconsidered if the development design introduces elevated external infrastructure or significant visible emissions.

2. METHODOLOGY

A desktop study was conducted to determine the Civil Aviation potential for the site selected for the proposed development based on the available data, the area's topography and the outline of building around the selected site. The site's current Civil Aviation status was based on the findings of the screening tool report generated on 06/06/2026 at 10:34:38.

The following information was used to compile the statement report.

- Existing spatial databases were used to determine the location of Civil Aviation installations in relation to the proposed project area, and to identify preliminary areas of concern in terms of impacts to Civil Aviation installations;
- The proposed project site and footprint were plotted on the Screening Tool to identify the sensitivity allocated;
- A site visit was undertaken to confirm the current land use and the environmental sensitivity as it relates to Civil Aviation.

3. DESKTOP AND SITE ASSESSMENT

3.1. Civil Aviation assessment of the site.

The proposed area selected for the waste management activities will be located within the boundary of an already disturbed industrial and commercially zoned area. The proposed activity is not expected to have any direct or indirect impact on the operation or safety of any civil aviation aerodrome in the surrounding area.

The proposed activities may generate controlled particulate matter, volatile organic compounds and other process emissions. Under normal operating conditions, these emissions will be captured and

managed through enclosed processing, local extraction and suitable air-pollution-control systems. The proposed activities are therefore not expected to generate a visible or sustained plume that could materially interfere with aviation operations.

Abnormal incidents, particularly lithium-ion battery fires, could generate smoke and thermal plumes. These risks will be addressed through the facility fire-risk assessment, emergency-response plan, fire-prevention and suppression systems, and liaison with the relevant emergency services. No conclusion of negligible civil aviation impact is dependent on uncontrolled atmospheric emissions being permitted.

The RSA Airspaces in a 3D data KMZ file is an initiative undertaken by the ATNS to illustrate the definitions and complexities of airspace, routes, aerodromes and navigational facilities within South Africa to the public in the interest of safety. By making use of this 3D modelled KMZ files, possible flight routes and aerodrome localities could be plotted. The following information was obtained with the use of the database:

Aerodromes & Helistops- within 8km radius	Aerodromes & Helistops- within 15km radius	Aerodromes & Helistops- within 35km radius
Downtown Helistop	Panorama Airfield (R206)	O.R. Tambo International Airport (FAOR)
Gold reef Helistop	Tedderfield (FATA) (R428)	Lanseria International Airport (FALA)
	Syferfontein (FASY) (R078)	Grand Central Aerodrome (139/05/0087)
	Meyersdal Eco Estate Helistop	Eagles Creek Aviation Estate (139/05/0099)
	Rand Airport (139/05/0090)/ (FAGM)	Brakpan Benoni Airfield (139/05/0091)
	Capital Hill Helistop	NTT VW Krugersdorp Helistop
	Rand Refinery Helistop	Muldersdrift Helistop
		The Campus Helistop
		Wilton Helistop
		Steyn City Properties Helistop
		Fidelity ADT Helistop
		Diepsloot Helistop
		Ultimate Helistop
		CPI Helistop
		A.T.E Helistop
		SPH Helistop
		DSV Helistop
		NOAG'S Market Helistop
		Spartan Helistop
		Glynnwood Hospital Helistop

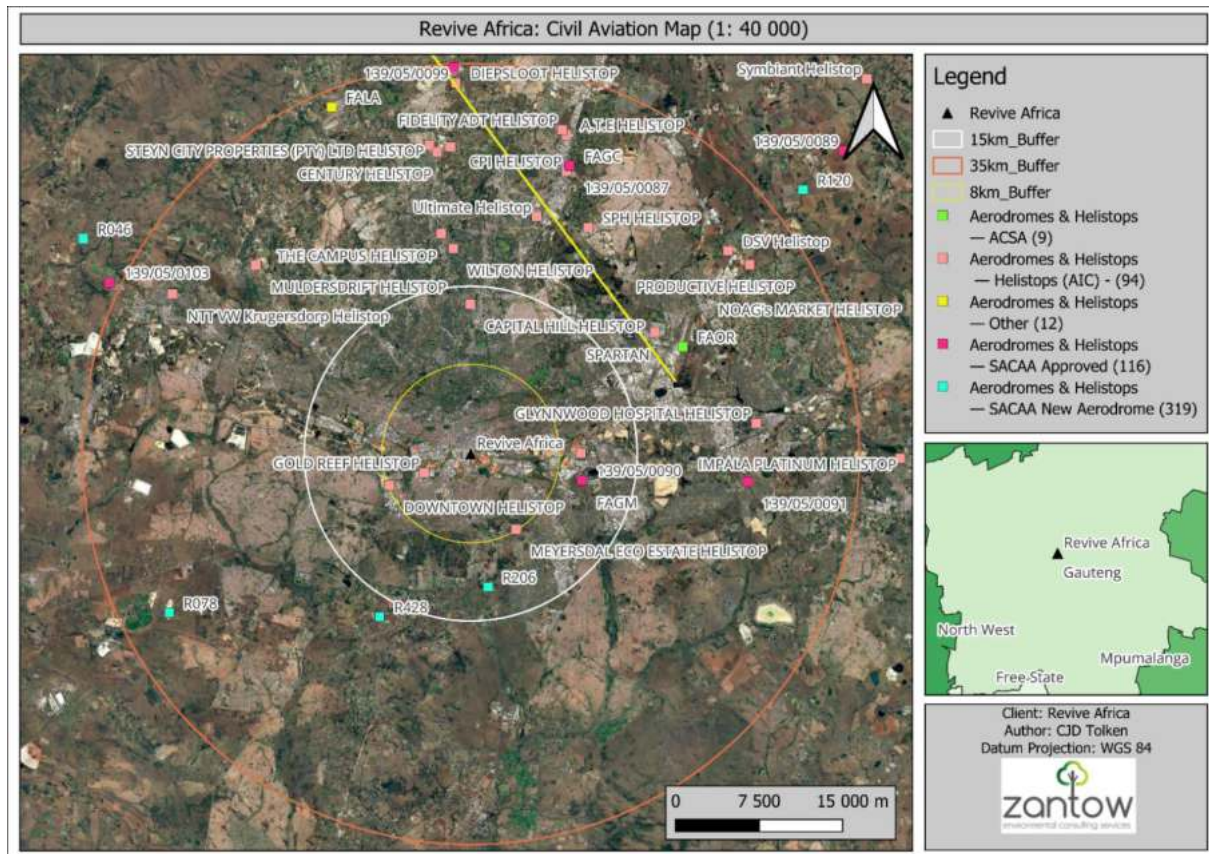


Figure 3: Civil Aviation Receptors Map

Aviation receptor	Type	Direction from site	Approximate distance	Applicable sensitivity buffer	Potential interaction
Downtown Heliport	Helistop	South-west	3 km	8 km	None anticipated
Gold Reef Heliport	Helistop	South-west	4 km	8 km	None anticipated
Panorama Airfield (R206)	Aerodrome	South	12 km	15 km	No obstacle or flight-path interference anticipated
Tedderfield Airfield (FATA)	Aerodrome	South-southwest	15 km	15 km	No obstacle or flight-path interference anticipated
Syferfontein Airfield (FASY)	Aerodrome	North-west	15 km	15 km	No obstacle or flight-path interference anticipated
Meyersdal Eco Estate Heliport	Helistop	South	13 km	15 km	None anticipated
Rand Airport (FAGM)	Aerodrome	East	10 km	15 km	No obstacle or flight-path interference anticipated
Capital Hill Heliport	Helistop	North	13 km	15 km	None anticipated
Rand Refinery Heliport	Helistop	East-southeast	8 km	15 km	None anticipated

O.R. Tambo International Airport (FAOR)	International airport	East-northeast	20 km	35 km	No material interaction anticipated
Lanseria International Airport (FALA)	International airport	North-west	33 km	35 km	No material interaction anticipated
Grand Central Aerodrome	Aerodrome	North	26 km	35 km	No material interaction anticipated
Eagles Creek Aviation Estate	Aerodrome	North	31 km	35 km	No material interaction anticipated
Brakpan Benoni Airfield	Aerodrome	East	34 km	35 km	No material interaction anticipated
NTT VW Krugersdorp Helistop	Helistop	West	34 km	35 km	None anticipated
Muldersdrift Helistop	Helistop	North-west	35 km	35 km	None anticipated
The Campus Helistop	Helistop	North	18 km	35 km	None anticipated
Wilton Helistop	Helistop	North	22 km	35 km	None anticipated
Steyn City Properties Helistop	Helistop	North-west	30 km	35 km	None anticipated
Fidelity ADT Helistop	Helistop	North	18 km	35 km	None anticipated
Diepsloot Helistop	Helistop	North	28 km	35 km	None anticipated
Ultimate Helistop	Helistop	North	23 km	35 km	None anticipated
CPI Helistop	Helistop	North-east	21 km	35 km	None anticipated
A.T.E. Helistop	Helistop	East	18 km	35 km	None anticipated
SPH Helistop	Helistop	North-east	19 km	35 km	None anticipated
DSV Helistop	Helistop	East	22 km	35 km	None anticipated
NOAG'S Market Helistop	Helistop	North	24 km	35 km	None anticipated
Spartan Helistop	Helistop	East-northeast	18 km	35 km	None anticipated
Glynnwood Hospital Helistop	Helistop	East	28 km	35 km	None anticipated

3.2. Fire, smoke and emergency aviation risks

Lithium-ion battery storage and processing present a potential abnormal-event risk associated with thermal runaway, fire and the generation of smoke and thermal plumes. Although such an event is not expected during normal operations, the potential consequence must be considered because several helistops and aerodromes occur within the broader aviation study area.

The project-specific fire-risk assessment and Emergency Preparedness and Response Plan must provide for early detection, isolation, suppression, emergency notification and management of smoke-generating incidents. Where an incident could generate a significant off-site smoke plume, the relevant emergency services and aviation authorities must be notified through the applicable emergency communication channels.

The residual civil aviation risk should then be recorded as **low under normal operation and low to medium during a major uncontrolled fire**, subject to implementation of the fire-risk controls.

4. SITE VISIT

In November 2025 and again in March 2026, a site visit was conducted. This report includes site images that were taken during the site visit. The existing site has been previously developed, and the current infrastructure has no impact on civil aviation activities. The proposed waste management activities will be conducted within the existing infrastructure, within an already disturbed industrial and commercially zoned area.

The proposed development will therefore have no impact on the operations of the existing aerodromes or surrounding airspace. Below are figures from the site visit depicting the activities currently undertaken on site.

Table 1. Photos taken during site visit.



Figure 4. Revive Africa (existing operation) building



Figure 5. Proposed building for increasing processing capacity.



Figure 6. Paved parking area behind building



Figure 7. Cemented surfaces inside building.



Figure 8. Electrical scrap storage containers.



Figure 9. Grading bins.



Figure 10. Scale



Figure 11. Work benches



Figure 12. Processed LIB materials.



Figure 13. Processed materials (black mass).



Figure 14. Toner storage.



Figure 15. Printer and toner storage.

5. SCREENING TOOL COMPARISON AND CONCLUSION

The screening tool identifies the area as a **high sensitivity** towards the Civil Aviation Theme.

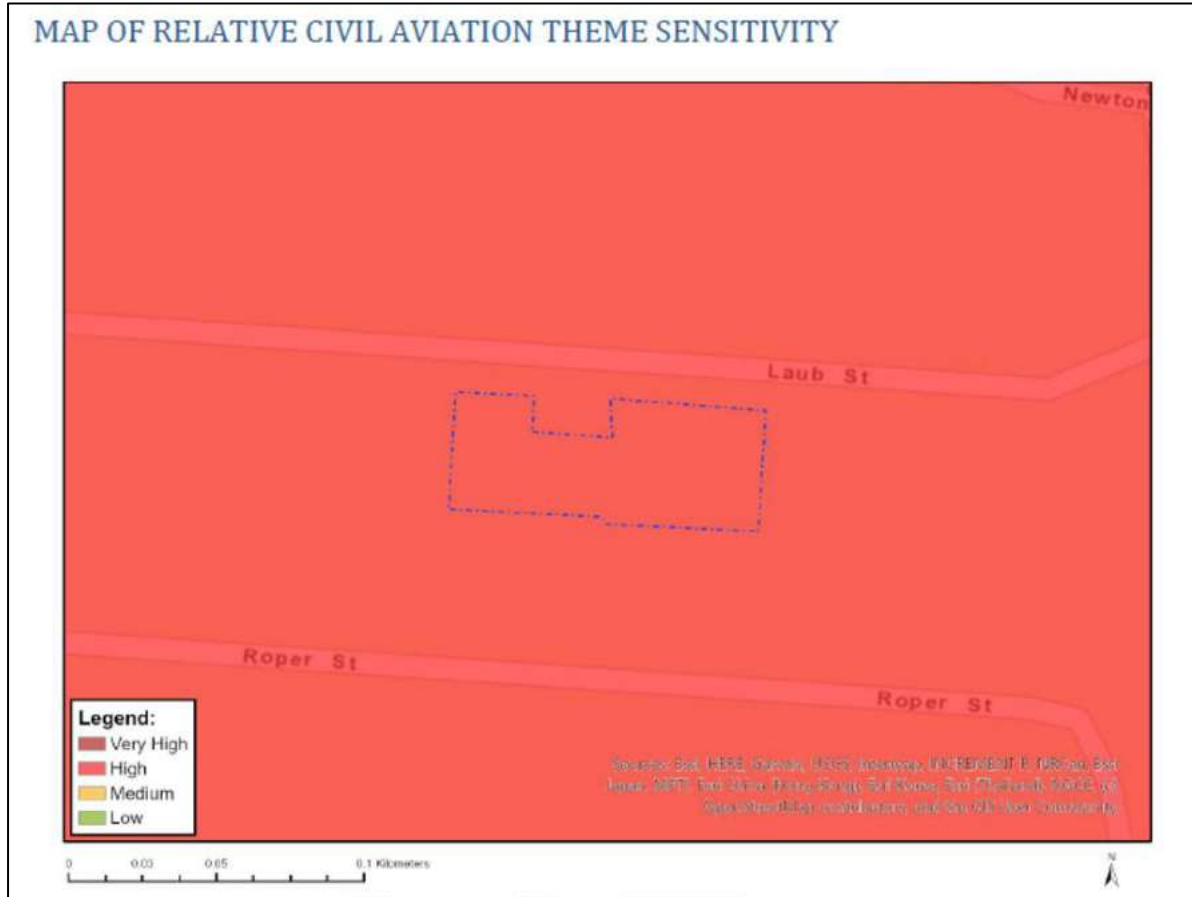


Figure 16: National Screening Tool – Civil Aviation Theme

Based on the findings of the assessment and available information it was determined that the site in its current state in fact has **low to negligible impact on Civil Aviation activities in the area.**

The site received a high sensitivity rating due to its location within 8 km and 35 km of civil aviation aerodrome infrastructure. Several civil aviation facilities were identified within the applicable buffer zones. However, the proposed development is not expected to affect the operations of existing aerodromes or the surrounding airspace, as all activities will be undertaken within existing infrastructure and will not interfere with civil aviation operations.

The conclusion is based on the assumption that no new permanent structure, stack, mast, antenna, crane or other obstruction will extend materially above the existing building roofline. Any future infrastructure that exceeds the existing building height or may affect protected airspace must be screened separately and, where required, referred to the relevant civil aviation authority before installation

In addition, the desktop information reviewed did not identify any mapped aviation route, aerodrome safeguarding surface or navigational facility that would be materially affected by the proposed activities. As no new elevated structures are proposed and operations will occur within existing buildings, the development is not expected to create an obstacle or interfere with normal aircraft movement

Conclusion

The National Environmental Screening Tool identifies the proposed site as having **high relative civil aviation sensitivity** because it is located within the prescribed proximity buffers associated with several aerodromes and helistops.

The site-sensitivity verification confirmed that the property is situated within an established and substantially transformed industrial and commercial area. The proposed PCB and lithium-ion battery recycling activities will be undertaken predominantly within existing buildings. No new aerodrome, landing area, elevated tower, mast or other major obstruction is proposed as part of the current development.

Based on the available aviation spatial information, site observations and proposed project design, no direct interference with an aerodrome, navigational facility, protected airspace or normal aircraft operation was identified. The project-specific civil aviation sensitivity is therefore considered **low**, notwithstanding the high relative sensitivity assigned by the Screening Tool.

The proposed activities may generate controlled particulate matter and gaseous emissions. Under normal operating conditions, these emissions will be captured and managed through enclosed processing and suitable extraction and air-pollution-control systems and are not expected to produce a visible or sustained plume that could interfere with aviation operations.

An abnormal lithium-ion battery fire could generate smoke and a thermal plume. This risk must be managed through the project fire-risk assessment, emergency-response plan, fire detection and suppression systems, smoke management and emergency notification procedures. Subject to implementation of these controls, the residual civil aviation risk is expected to remain low.

This conclusion is subject to the following conditions:

- Processing must occur within the identified existing buildings;
- No significant new structure may extend above the existing roofline without further aviation screening;
- Extraction stacks and rooftop equipment must be designed so that they do not constitute an aviation obstruction;
- No uncontrolled visible emission or persistent plume may be generated;
- External lighting must be designed to avoid glare or confusion for aircraft;
- Temporary cranes or elevated construction equipment must be assessed where applicable; and
- The civil aviation assessment must be reconsidered if the project design, building height, process emissions or development footprint materially changes.

On this basis, no significant adverse civil aviation impact is anticipated, and a more detailed civil aviation impact assessment is not considered necessary for the development as currently proposed.

ANNEXURE A

SPECIALIST CV

Annexure H1

Impact Assessment Tables-Preferred Alternative

Environmental impact category (nature)	Description of environmental aspect	Duration	Probability	Extent	Irreplaceable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
Air quality	Vehicle exhaust emissions - air pollution	1	1	1	0	1	3	Low	Vehicles must not idle while not in use.	0,1	0	2,7	Low
Stormwater and soil contamination	Storage and use of hazardous substances including paint, grease, cleaning agents	1	4	3	0	2	16	Low	All hazardous substances must be stored in dedicated areas and good housekeeping must be applied. Spillages must be cleaned appropriately Contaminated rubble or soil must be stored in a separate and demarcated area before being disposed of at a licensed landfill site.	0,1	0,08	13,12	Low
Waste management	Poor general waste management - wind blown litter leading to nuisance conditions, burning of waste	1	4	3	0	3	24	Low	Existing containment facilities may be used where a generated waste stream cannot be contained in a demarcated skips or bin until the material can be removed for re-use, recycling or safe disposal as appropriate. All waste removed from site during the construction phase must be transferred to licensed facilities for recycling or re-use where possible. Waste streams which cannot be recycled or re-used must be disposed of at licensed disposal facilities. Obtain safety disposal certificates for hazardous waste disposed. Burning of waste must be prohibited on site.	0,15	0,08	18,48	Low
Natural resource management	Wasteful use of resources like water and electricity leads to unnecessary impacts on the national resources.	1	5	5	2	5	65	Low	No running taps to be left unattended. Switch off lights when not in use.	0,05	0,06	57,85	Low

Noise generation	Noise impact on adjacent businesses and employees	1	3	3	0	2	14	Low	Ensure noise levels are compliant to the limits specified in the Occupational Health and Safety Act.	0,05	0,06	12,46	Low
Socio-economic	Temporary employment opportunities	1	10	5	0	5	80	Low positive					

Environmental impact category (nature)	Description of environmental aspect/activity	Duration	Probability	Extent	Irreplaceable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
Air quality impacts	Fugitive dust emissions-handling, dismantling, grinding, shredding, and milling of PCBs	7	9	4	0	8	160	Medium	All operations are to be conducted in enclosed shredder systems The operational area must be well ventilated and equipped with fume and dust extractors Conduct regular inspections and maintenance of fume and dust extractors to ensure all systems are operating efficiently All employees must be equipped with adequate PPE	0,15	0,1	120	Low
	Vehicle Emissions-Loading and Off-loading Goods	7	9	5	0	4	84	Low	Vehicles must not idle.	0	0	84	Low
	Volatile emissions-Gases from LIB shredding processes	7	9	5	0	8	168	Medium	All LIB processing should be conducted in fully enclosed and inert systems to prevent thermal runaway The operational area shall be well ventilated for personnel safety and equipped with explosion-rated fume and dust extraction systems designed for use with inert process equipment. Ensure maintenance of fume and dust extracting systems is conducted regularly Ensure all personnel is equipped with the correct PPE that is worn at all times Have signages indicating correct PPE for working area Provide adequate training for personnel on LIB recycling to reduce the release of volatile emissions	0,15	0,1	126	Low

Environmental impact category (nature)	Description of environmental aspect/activity	Duration	Probability	Extent	Irreplaceable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
Surface water and soil contamination	Leachate of hazardous substances- During waste handling, dismantling, and milling of PCBs	7	5	5	0	9	153	Medium	Ensure all PCB waste management procedures are done in the building with impermeable surfaces to prevent leachate of material to environment. All hazardous components removed from e-waste to be stored in containers and clearly labelled to indicate the contents All waste storage containers must be in good integrity.	0,15	0,08	118	Low
	Leachate of hazardous substances-During handling and shredding of LIBs	7	8	5	0	10	200	High	All LIB recycling must be conducted inside the operational area on an impermeable surface Employees must be properly trained on the correct handling of LIBs In the event of breakage any residue or powder from LIB processing is released it must be swept up immediately to prevent stormwater contamination A spill kit must be readily available and employees must be appropriately trained on how it is to be used	0,15	0,08	154	Medium
	Generation of spent sodium solution- LIB Discharge	7	8	3	0	8	144	Medium	Reuse the salt solution where practicable and replace only when operational limits are reached. Store fresh and spent solution in banded, impermeable containment areas and prevent contact with stormwater. Implement spill prevention measures, maintain spill response equipment and train personnel in emergency procedures. Ensure spent solution is collected by duly authorized waste management service providers for disposal, maintain disposal certificates.	0,15	0,08	111	Low

Environmental impact category (nature)	Description of environmental aspect/activity	Duration	Probability	Extent	Irreplaceable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
	Oil leaks/Spillages of hazardous materials	7	8	4	0	6	114	Low	All spills must be captured and reported as incidents using Revive Africa's internal incident reporting procedure Employees must be appropriately trained to handle spills A spill kit must be readily available Absorbent material used to clean spills must be treated as hazardous waste,	0,05	0,06	101	Low
	Waste (feedstock) storage and handling-LIB	7	8	5	0	5	100	Low	LIBs must be stored in a dry and well ventilated area, with no exposure to heat Implement good house keeping practices at the storage area.	0,05	0,08	87	Low
	Waste (feedstock) storage and handling-PCBs	7	8	5	0	5	100	Low	PCBs must be stored at their designated storage area in accordance to their grading as per Revive Africa's grading processes All components removed from the PCBs must be stored in designated storage containers that are correctly labelled	0,05	0,08	87	Low
	Waste generated- non-recyclable material	7	8	7	0	6	132	Medium	Waste must be stored in dedicated skips/bins and disposed at an appropriately licenced landfill site or sent to duly authorised upstream/downstream service providers. General and hazardous waste must be managed separately Use only credible and authorised waste contractors to transport and manage waste. Obtain safety disposal certificates for hazardous waste disposed. Burning of waste must be prohibited on site.	0,1	0,08	108	Low

Environmental impact category (nature)	Description of environmental aspect/activity	Duration	Probability	Extent	Irreplaceable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
Waste management	Handling of General Waste	7	5	6	0	7	126	Low	The site must be kept clear of litter Where possible general waste such as paper, cans and plastic must be separated and recycled General waste must be kept in clearly labelled containers General Waste must not be mixed with Hazardous waste Employees must be trained on the Handling of Waste General waste must be disposed at an appropriately licenced disposal site Records must be kept of the volumes of waste disposed	0,05	0,08	110	Low
	Handling of Hazardous Waste	7	9	6	1	8	184	Medium	Hazardous waste generated on-site must be stored in an appropriately labelled container Containers containing hazardous waste must be stored on an impermeable surface Hazardous and general waste must not be mixed Employees must be appropriately trained on the handling of Hazardous waste Hazardous waste must be removed from site and disposed by an appropriately licenced contractor at an appropriately licenced landfill site Records must be kept of the volumes of waste disposed	0,1	0,1	147	Medium
Natural resource management	Wasteful use of resources such as water and electricity leads to unnecessary impacts on the national resources.	7	6	6	2	5	105	Low	No running taps to be left unattended. Switch off lights when not in use.	0,05	0,1	89,3	Low

Revive Africa
Operational- Preferred Alternative

Environmental impact category (nature)	Description of environmental aspect/activity	Duration	Probability	Extent	Irreplaceable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
SHE	Occupational exposure to noise and residue in the operational areas	7	5	5	0	9	153	Medium	Keep noise levels as low as possible. Provide Health and Safety Toolbox Talks Maintain effective ventilation in the operational area. Appropriate PPE must be provided to all employees.	0,15	0,1	115	Low
	Thermal runaway from LIB processing	7	5	5	3	10	200	High	Ensure LIB recycling processes are conducted in a controlled environment. Ensure fire response equipment is provided and all employees duly trained on how to handle thermal runaway from LIB processing. Appropriate PPE must be provided to all employees.	0,1	0,08	164	Medium
Social	Permanent employment opportunities	7	10	5	0	8	176	Medium positive					
Waste recycling	Recycling of waste will prevent disposal to landfill	7	10	7	0	15	360	High positive					

Environmental impact category (nature)	Description of environmental aspect/activity	Duration	Probability	Extent	Irreplaceable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
Emissions to the atmosphere	Vehicle exhaust emissions - air pollution	3	8	3	0	5	70	Low	All vehicles to be maintained in good working order to keep their atmospheric emissions under control Prohibit idling of vehicles when not in use	0,05	0	66,5	Low
Storm water discharge	Hydrocarbon spillages from decommissioning vehicles and machines - storm water pollution	5	6	5	0	5	80	Low	Place drip trays beneath parked vehicles Spill kits must be available and train employees to implement spill kits	0,1	0,08	65,6	Low
Waste management	Storage and handling of general waste and building rubble - wind blown litter leading to nuisance conditions	3	6	3	0	5	60	Low	Store general and hazardous waste separately in their designated storage areas, designed to prevent windblown litter Appropriate skips or waste containers that are clearly labelled must be provided to store waste Maintain an inventory of waste generated and records keep records of how it was managed during the construction phase Prevent nuisance conditions and overfilling of skips and include the inspections thereof in the weekly ECO inspections Ensure that all waste removed is disposed or recycled by duly authorised service providers	0,05	0,08	52,2	Low
Socio-economic	Loss of employment opportunities due to closure of the site	5	8	5	0	13	234	High	Engagement with employees in advance Redirect employees to other operational units where possible	0,05	0,08	203,58	High

Environmental impact category	Description of environmental aspect (nature)	Duration	Probability	Extent	Irreplacable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10% to 15%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
SHE	Thermal runaway from LIB processing	7	5	5	3	10	200	High	Ensure LIB recycling processes are conducted in a controlled environment. Ensure fire response equipment is provided and all employees duly trained on how to handle thermal runaway from LIB processing. Appropriate PPE must be provided to all employees.	0,1	0,08	164	Medium
Surface water and soil contamination	Leachate of hazardous substances-During handling and shredding of LIBs	7	8	5	0	10	200	High	All LIB recycling must be conducted inside the c	0,15	0,1	150	Medium

Revive Africa
No-go alternative- Preferred Alternative

Environmental impact category	Description of environmental aspect and impact (nature)	Duration	Probability	Extent	Irreplacable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
Socio-economic impacts	Loss of revenue - will continue to use current raw material	7	8	5	0	10	200	High	Investigate alternative methods to contribute to local economy	0,05	0,08	174	Medium
	Loss of employment opportunities	7	8	5	0	10	200	High	Investigate alternative methods to contribute to local economy	0,05	0,08	174	Medium

Annexure H2

Impact Assessment Tables- Alternative 1

Environmental impact category (nature)	Description of environmental aspect	Duration	Probability	Extent	Irreplaceable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
Air quality	Vehicle exhaust emissions - air pollution	1	1	1	0	1	3	Low	Vehicles must not idle while not in use.	0,1	0	2,7	Low
Stormwater and soil contamination	Storage and use of hazardous substances including paint, grease, cleaning agents	1	4	3	0	2	16	Low	All hazardous substances must be stored in dedicated areas and good housekeeping must be applied. Spillages must be cleaned appropriately Contaminated rubble or soil must be stored in a separate and demarcated area before being disposed of at a licensed landfill site.	0,1	0,08	13,12	Low
Inefficient use of resources	Infrastructure Installation- use of steel, copper cables and control systems for automated equipment	1	4	5	3	4	52	Low	Optimise the design to minimise the quantities of steel, copper, concrete, and cabling required. Ensure systems are installed by duly qualified personnel.	0,05	0,04	47,32	Low

Waste management	Poor general waste management - wind blown litter leading to nuisance conditions, burning of waste	1	4	3	0	3	24	Low	Existing containment facilities may be used where a generated waste stream cannot be contained in a demarcated skips or bin until the material can be removed for re-use, recycling or safe disposal as appropriate. All waste removed from site during the construction phase must be transferred to licensed facilities for recycling or re-use where possible. Waste streams which cannot be recycled or re-used must be disposed of at licensed disposal facilities. Obtain safety disposal certificates for hazardous waste disposed. Burning of waste must be prohibited on site.	0,15	0,08	18,48	Low
Natural resource management	Wasteful use of resources like water and electricity leads to unnecessary impacts on the national resources.	1	5	5	2	5	65	Low	No running taps to be left unattended. Switch off lights when not in use.	0,05	0,06	57,85	Low
Noise generation	Noise impact on adjacent businesses and employees	1	3	3	0	2	14	Low	Ensure noise levels are compliant to the limits specified in the Occupational Health and Safety Act.	0,05	0,06	12,46	Low
Socio-economic	Technology adoption-Financial Investment and technology readiness	1	9	8	0	15	270	High-Negative					
	Temporary employment opportunities	1	10	5	0	5	80	Low positive					

Environmental impact category (nature)	Description of environmental aspect/activity	Duration	Probability	Extent	Irreplacable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
Air quality impacts	Fugitive dust emissions-handling and recycling of PCBs	7	9	4	0	8	160	Medium	All operations are to be conducted in enclosed shredder systems The operational area must be well ventilated and equipped with fume and dust extractors Conduct regular inspections and maintenance of fume and dust extractors to ensure all systems are operating efficiently All employees must be equipped with adequate PPE	0,1	0,1	128	Low
	Vehicle Emissions-Loading and Off-loading Goods	7	9	5	0	4	84	Low	Vehicles must not idle.	0	0	84	Low
	Volatile emissions-Gases from LIB recycling processes	7	9	5	0	8	168	Medium	All LIB processing should be conducted in fully enclosed and inert systems to prevent thermal runaway The operational area shall be well ventilated for personnel safety and equipped with explosion-rated fume and dust extraction systems designed for use with inert process equipment. Ensure maintenance of fume and dust extracting systems is conducted regularly Ensure all personnel is equipped with the correct PPE that is worn at all times Have signages indicating correct PPE for working area Provide adequate training for personnel on LIB recycling to reduce the release of volatile emissions	0,05	0,1	143	Medium
	Higher electricity demand-use of robotics, IoT, machine vision and automated equipment	7	9	6	4	8	208	High	Install smart energy management systems to monitor, record, and optimise electricity use in real time. Implement an Energy Management Plan and monitor electricity consumption against production output.	0,1	0,06	175	Medium

Environmental impact category (nature)	Description of environmental aspect/activity	Duration	Probability	Extent	Irreplaceable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
Energy Consumption	Indirect greenhouse gas emissions from electricity consumption	7	9	8	4	8	224	High	Ensure machinery and equipment are duly maintained according to manufacturer's specifications or annually for efficient operations. Train operators on energy-efficient operating practices. Develop and implement an Energy Efficiency and Greenhouse Gas Reduction Plan.	0,1	0,06	188	Medium
	Energy recovery-Resistor discharge	7	9	3	0	15	285	High-Positive					
Surface water and soil contamination	Leachate of hazardous substances- During waste handling, dismantling, of PCBs	7	5	5	0	9	153	Medium	Ensure all PCB waste management procedures are done in the building with impermeable surfaces to prevent leachate of material to environment. All hazardous components removed from e-waste to be stored in containers and clearly labelled to indicate the contents All waste storage containers must be in good integrity.	0,1	0,08	125	Low
	Chemical spills and contaminated wastewater from LIB mechano-chemical separation	7	8	5	0	10	200	High	All LIB recycling must be conducted inside the operational area on an impermeable surface Employees must be properly trained on the correct handling of LIBs Wastewater must be managed in an environmentally sustainable manner by duly authorised service providers Effluent from recycling process must not be discharged to municipal infrastructure prior treatment, once treated permission must be obtained from municipality prior discharge	0,1	0,08	164	Medium

Environmental impact category (nature)	Description of environmental aspect/activity	Duration	Probability	Extent	Irreplacable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
	Oil leaks/Spillages of hazardous materials	7	8	4	0	6	114	Low	All spills must be captured and reported as incidents using Revive Africa's internal incident reporting procedure Employees must be appropriately trained to handle spills A spill kit must be readily available Absorbent material used to clean spills must be treated as hazardous waste,	0,05	0,06	101	Low
	Waste (feedstock) storage and handling-LIB	7	8	5	0	5	100	Low	LIBs must be stored in a dry and well ventilated area, with no exposure to heat Implement good house keeping practices at the storage area.	0,05	0,08	87	Low
	Waste (feedstock) storage and handling-PCBs	7	8	5	0	5	100	Low	PCBs must be stored at their designated storage area in accordance to their grading as per Revive Africa's grading processes All components removed from the PCBs must be stored in designated storage containers that are correctly labelled	0,05	0,08	87	Low
	Waste generated- non-recyclable material	7	8	7	2	7	168	Medium	Waste must be stored in dedicated skips/bins and disposed at an appropriately licenced landfill site or sent to duly authorised upstream/downstream service providers. General and hazardous waste must be managed separately Use only credible and authorised waste contractors to transport and manage waste. Obtain safety disposal certificates for hazardous waste disposed. Burning of waste must be prohibited on site.	0,1	0,08	138	Low

Environmental impact category (nature)	Description of environmental aspect/activity	Duration	Probability	Extent	Irreplacable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
Waste management	Handling of General Waste	7	5	6	0	7	126	Low	The site must be kept clear of litter Where possible general waste such as paper, cans and plastic must be separated and recycled General waste must be kept in clearly labelled containers General Waste must not be mixed with Hazardous waste Employees must be trained on the Handling of Waste General waste must be disposed at an appropriately licenced disposal site Records must be kept of the volumes of waste disposed	0,05	0,08	110	Low
	Handling of Hazardous Waste	7	8	6	0	8	168	Medium	Hazardous waste generated on-site must be stored in an appropriately labelled container Containers containing hazardous waste must be stored on an impermeable surface Hazardous and general waste must not be mixed Employees must be appropriately trained on the handling of Hazardous waste Hazardous waste must be removed from site and disposed by an appropriately licenced contractor at an appropriately licenced landfill site Records must be kept of the volumes of waste disposed	0,15	0,1	126	Low
Natural resource management	Wasteful use of resources such as water and electricity leads to unnecessary impacts on the national resources.	7	6	6	2	5	105	Low	No running taps to be left unattended. Switch off lights when not in use.	0,05	0,1	89,3	Low

Environmental impact category (nature)	Description of environmental aspect/activity	Duration	Probability	Extent	Irreplaceable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
SHE	Occupational exposure to noise and residue in the operational areas	7	5	5	0	9	153	Medium	Keep noise levels as low as possible. Provide Health and Safety Toolbox Talks Maintain effective ventilation in the operational area. Appropriate PPE must be provided to all employees.	0,1	0,1	122	Low
	Electrical faults or thermal runaway during automated LIB dismantling	7	5	6	3	10	210	High	Ensure LIB recycling processes are conducted in a controlled environment. Conduct maintenance of equipment according to manufacture specifications or annually Install fire detection systems and ensure fire response equipment is provided and all employees duly trained on how to handle thermal runaway from LIB processing. Appropriate PPE must be provided to all employees.	0,1	0,08	172	Medium
	Exposure to robotic equipment and moving machinery	7	6	8	0	7	147	Medium	Assign designated walkways for personnel and install physical barriers, perimeter fencing, and machine guarding around all robotic cells and moving machinery to prevent unauthorised access. Provide Health and Safety Toolbox Talks Provide adequate training for all machinery operators and restrict access to robotic work areas to authorised and trained personnel only. Appropriate PPE must be provided to all employees. Develop and implement Safe Operating Procedures (SOPs) for operating, cleaning, and maintaining automated equipment	0,05	0,08	128	Low

Environmental impact category (nature)	Description of environmental aspect/activity	Duration	Probability	Extent	Irreplacable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
	Exposure to chemicals- LIB mechano-chemical separation	7	6	8	0	8	168	Medium	Install emergency eyewash stations and safety showers in areas where chemicals are stored or handled. Ensure all personnel receive training on chemical hazards, battery hazards, spill response, and emergency procedures. Restrict access to chemical handling areas to authorised and trained personnel only Conduct mechanical separation and any chemical treatment in enclosed or closed-process systems to minimise exposure. Appropriate PPE must be provided to all employees. Implement an occupational health surveillance programme for employees who may be routinely exposed to battery materials or hazardous chemicals.				
Socio-economic	Permanent employment opportunities	7	6	3	0	8	128	Low positive					
	Long term operational cost- Optimisation of LIB dismantling technology for different LIB battery chemistries	7	10	3	4	10	240	High Negative					
Waste recycling	Recycling of waste will prevent disposal to landfill	7	10	7	0	15	360	High positive					

Environmental impact category (nature)	Description of environmental aspect/activity	Duration	Probability	Extent	Irreplacable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
Emissions to the atmosphere	Vehicle exhaust emissions - air pollution	3	8	3	0	5	70	Low	All vehicles to be maintained in good working order to keep their atmospheric emissions under control Prohibit idling of vehicles when not in use	0,05	0	66,5	Low
Storm water discharge	Hydrocarbon spillages from decommissioning vehicles and machines - storm water pollution	3	6	5	0	5	70	Low	Place drip trays beneath parked vehicles Spill kits must be available and train employees to implement spill kits	0,1	0,08	57,4	Low
	Chemical spillages- Removal of infrastructure associated with mechano-chemical separation	3	8	6	0	8	136	Medium	Ensure decommissioning is conducted by duly trained personnel Spill kits must be available and train employees to implement spill kits	0,05	0,08	118,32	Low

Waste management	Storage and handling of general waste and building rubble - wind blown litter leading to nuisance conditions	3	6	3	0	5	60	Low	Store general and hazardous waste separately in their designated storage areas, designed to prevent windblown litter Appropriate skips or waste containers that are clearly labelled must be provided to store waste Maintain an inventory of waste generated and records keep records of how it was managed during the construction phase Prevent nuisance conditions and overfilling of skips and include the inspections thereof in the weekly ECO inspections Ensure that all waste removed is disposed or recycled by duly authorised service providers	0,05	0,08	52,2	Low
Social	Loss of employment opportunities due to closure of the site	5	8	5	0	13	234	High	Engagement with employees in advance Redirect employees to other operational units where possible	0,05	0,08	203,58	High

Environmental impact category	Description of environmental aspect (nature)	Duration	Probability	Extent	Irreplacable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10% to 15%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
Handling of Hazardous Waste	Hazardous and General waste is received, recovered, recycled and treated by Revive Africa. Improper handling, storage, recovery, recycling and treatment can lead to unacceptable impacts	7	8	6	1	10	220	High	Safe work procedures to safely store, handle, sort and process different waste streams, Adequate engineering controls	0,15	0,1	165	Medium
Energy Consumption	Higher electricity demand- use of robotics, IoT, machine vision and automated equipment	7	9	6	4	8	208	High	Install smart energy management systems to monitor, record, and optimise electricity use in real time. Implement an Energy Management Plan and monitor electricity consumption against production output. Ensure machinery and equipment are duly maintained according to manufacturer's specifications or annually for efficient operations.	0,1	0,06	174,72	Medium
	Indirect greenhouse gas emissions from electricity consumption	7	9	8	4	8	224	High	Train operators on energy-efficient operating practices. Develop and implement an Energy Efficiency and Greenhouse Gas Reduction Plan.	0,1	0,06	188,16	Medium
Surface water and soil contamination	Chemical spills and contaminated wastewater from LIB mechano-chemical separation	7	8	5	0	10	200	High	All LIB recycling must be conducted inside the o	0,1	0,08	164	Medium
SHE	Electrical faults or thermal runaway during automated LIB dismantling	7	5	6	3	10	210	High	Ensure LIB recycling processes are conducted in	0,1	0,08	172,2	Medium
Socio-economic	Long term operational cost- Optimisation of LIB dismantling technology for different LIB battery chemistries	7	10	3	4	10	240	High Negative					

Revive Africa
No-go alternative- Alternative 1

Environmental impact category	Description of environmental aspect and impact (nature)	Duration	Probability	Extent	Irreplacable loss of resources	Severity	Risk Rating Before Mitigation		Mitigation Measures	Mitigation Engineering (-10%) Admin (-5%)	Degree to which the impact can be reversed	Risk Rating After Mitigation	
Socio-economic impacts	Loss of revenue - will continue to use current raw material	7	8	5	0	10	200	High	Investigate alternative methods to contribute to local economy	0,05	0,08	174	Medium
	Loss of employment opportunities	7	8	5	0	10	200	High	Investigate alternative methods to contribute to local economy	0,05	0,08	174	Medium

Annexure I

Environmental Management Program (EMPr)



ENVIRONMENTAL MANAGEMENT PROGRAMME
FOR
CF AFRICA TRADING (PTY) LTD, T/A REVIVE AFRICA
GAUTENG PROVINCE



Report Nr: 4121-ZANREV-2026

Report date: 12 August 2026

GENERAL INFORMATION	
Report Name:	Environmental Management Program in Support of a Waste Management Licence for the Proposed Hazardous Waste (E-Waste) Recycling, Recovery and Treatment Facility at CF Africa t/a Revive Africa Located in New Centre, Johannesburg, Gauteng Province.
Report Date:	3 August 2026
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Report Compiled by:	Mbali Zwane
Report Reviewed by:	Karien Zantow
Report Nr:	4121-ZANREV-2026
WML Application Ref Nr:	12/9/11/L260623131323/3/N

TERMS AND DEFINITIONS

NEMA	National Environmental Management Act (No. 107 of 1998)
NEMAQA	National Environmental Management: Air Quality Act (No. 39 of 2004)
NEMWA	National Environmental Management Waste Act (No. 59 of 2008)
NWA	National Water Act (No.36 of 1998)
EMPr	Environmental Management Programme
GNR	Government Notice
GA	General Authorisation
GWIS	Gauteng Waste Information System
BA	Basic Assessment
EIA	Environmental Impact Assessment
EIR	Environmental Impact Assessment Report
EA	Environmental Authorisation
I&APs	Interested and affected Party
RoD	Record of Decision
WML	Waste Management License
WUL	Water Use Licence
GDARD	Gauteng Department of Agriculture and Rural Development
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
ECO	Environmental Control Officer
WMCO	Waste Management Control Officer
°C	Degrees Celsius
cm	Centimetres
I&AP	Interested and Affected Parties
kg	Kilograms
m	Metres
m ²	Square metres
m ³	Cubic metres
mm	Millimetres
PPE	Personal Protective Equipment
ECA	Environment Conservation Act, 1989
APPA	Atmospheric Pollution Prevention Act
SANS	South African National Standards
SAWIS	South African Waste Information System

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1. INTRODUCTION AND BACKGROUND

CF Africa Trading Pty (Ltd), trading as Revive Africa, currently operates a small-scale e-waste trading, storage and dismantling facility located at 24-26 Laub Street, New Centre Johannesburg. The company began operations in 2014 as a trader of empty printer cartridges that are collected through a corporate collections program. Revive Africa stores and prepare the cartridges prior to exporting them to upstream vendors for recycling. Since its inception, Revive Africa has expanded its operations into broader e-waste recycling. Since 2020, the company has collected over 434 593 laser cartridges and 982 404 ink units, keeping them out of landfill.

In April 2022, Revive Africa began trading printed circuit boards (PCBs) and collected a total of 96 306 kilograms to date. These PCBs are part of e-waste materials such as cell phones, computers, copiers, laptops, printers, servers, and telecommunications equipment. This initiative also led to the establishment of dedicated dismantling stations for the manual decontamination of the PCBs. Manual decontamination of e-waste also known as manual dismantling or depollution, involves the careful, non-destructive disassembly of electronic equipment by hand using tools such as screw drivers, hammers etc. to remove hazardous substances and separate materials for recycling. This process is crucial to isolate toxic components (like mercury, lead, and cadmium) from high-value materials (gold, copper, plastics), enhancing safety and recovery rates.

The facility soon realized that many of the devices they dismantle contained lithium-ion batteries (LIBs) and began a pilot project for discharging and recycling LIBs into black mass that is traded to upstream vendors for further metal extraction. The e-waste, consisting mainly of printer cartridges, printed circuit boards (PCBs) and Lithium-Ion batteries are collected through a corporate collections program before being transported to the Revive Africa facility. Majority of the material received is only subjected to re-packaging before being traded to upstream vendors for further processing.

With the proven success of the trials, Revive Africa now plans to establish a full-scale e-waste recycling facility comprising a PCB Recycling Plant and a Lithium-Ion Battery Recycling Plant. This project aims to process materials locally, create employment, and contribute to sustainable resource recovery in South Africa. The proposed facility entails increasing the volumes of e-waste accepted, as well as expanding their footprint to the adjacent buildings in 28-32 Laub Street, New Center Johannesburg. The proposed services for the e-waste management processes include recycling, treatment and recovery of e-waste and LIBs.

a) The planned PCB recycling facility will cover 1 800 m², dedicated to e-waste storage, dismantling, and processing. The plant will be capable of processing 40-50 tons of PCBs per month and is expected to create at least 15 new jobs, depending on volume. PCBs will be collected, graded, shredded and sold to upstream vendors for further processes.

b) The battery recycling facility will occupy approximately 900 m², for battery storage, discharging, shredding, and screening. It will have the capacity to process up to four (4) tons of lithium-ion batteries per day. The process will entail discharging batteries, shredding them into granulate, and screening the granulate to separate the black mass from plastic and copper residues. Comprehensive environmental and safety controls will be implemented to manage VOCs, fluorinated gases, and particulate emissions to ensure safe operations.

In addition to the recycling, recovery and treatment activities Revive Africa will utilise the space available within the facility for storage as well as the continuation of the printer cartridges trade. The facility is registered with the Department of Forestry, Fisheries and the Environment in terms of the Norms and Standards for the Storage of Hazardous Waste (Reg. Nr.: 12/9/11/ST574/3).

In terms of the National Environmental Management: Waste Act (No. 59 of 2008) (NEMWA), waste management activities that are listed in regulations published under NEMWA may not be undertaken without a Waste Management License (WML). The listed activities for which a WML is required are contained in Government Notice (GN) 921. Category A activities require a WML, and a Basic Impact Assessment (BA) process must be conducted, and Category B activities require a WML, and a full Scoping and Environmental Impact Assessment (EIA) process must be conducted.

The proposed waste management activities at Revive Africa will therefore trigger the following activities published under Category B of GN 921:

GNR 921 - Listed activity	Description of listed activity
B (2)	<i>The reuse or recycling of hazardous waste in excess of 1 ton per day, excluding reuse or recycling that takes place as an integral part of an internal manufacturing process within the same premises.</i>
B (3)	<i>The recovery of waste including the refining, utilisation, or co-processing of the waste at a facility that processes in excess of 100 tons of general waste per day or in excess of 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises.</i>
B (4)	<i>The treatment of hazardous waste using any form of treatment at a facility that processes in excess of 1 ton per day calculated as a monthly average, excluding the treatment of effluent, wastewater, sewage or organic waste using composting or any other organic waste treatment.</i>
B (10)	<i>The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).</i>

Revive Africa is therefore applying for a WML in terms of NEMWA, for which a Full Scoping EIA process will be followed. The waste streams that are processed at the facility have been classified as hazardous waste. The Competent Authority (CA) for the WML application has therefore been identified as the Department of Forestry, Fisheries and the Environment (DFFE).

An Environmental Management Programme (EMPr) must accompany the Full Scoping EIA process in terms of Regulation 23 of the Environmental Impact Assessment ("EIA") regulations (GNR 982) and

this EMPr has been developed according to the requirements set out in Appendix 4 of GNR 982. In addition, the EA also requires that an EMPr be developed and implemented in order to manage and mitigate potential impacts associated with the undertaking of the activity.

2. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Zantow Environmental Consulting Services (Zantow Environmental) has been appointed by Revive Africa as the independent EAP to facilitate the WML application as well as to facilitate the BA process for the proposed modification and upgrade of the waste management activities. The EAP's details are summarised below:

Independent consultant	Zantow Environment Consulting Services cc
Contact person	Karien Zantow
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This document was prepared by Mbali Zwane, an environmental consultant and reviewed by Karien Zantow from Zantow Environmental, with the following credentials:

Karien Zantow

Karien Zantow obtained her degree from the University of Pretoria in BSc (Agric) Animal Science. The main subjects were Physiology, Nutrition, Ecology, Biochemistry, Toxicology, Plant production, Soil Science and Pasture Science. This degree provided her with a sound base and understanding of the environment.

Karien extended her knowledge in the environmental sciences by completing the BSc (Hons) Environmental Technology at the University of Pretoria. The honours degree presented by the Chemical engineering department addressed Environmental management that included South African environmental legislation, ISO 14001, Environmental impact assessments, Life cycle assessment, auditing and public participation. As well as the three specialized fields of study: Water (wastewater treatment and design), air (abatement equipment) and solid/hazardous waste management. She also completed a Post Graduate diploma in Environmental Sciences at the University of Witwatersrand which focussed on Environmental Law, Environmental Chemistry, Air quality and Energy, Waste and Wastewater management and Environmental Impact Assessments.

Karien Zantow has more than 15 years of environmental experience in the construction, mining and industrial sectors working within the legislative environment.

- Teaching Business, subcontracted to Barlow World (1 year)
- Sappi Kraft Ngodwana (2 years) – As environmental engineer
- ArcelorMittal South Africa Vanderbijlpark Works (7 years)
- Zantow Environmental Consulting Services (August 2012 – current)

During her career she has been involved with many large-scale site characterisation and remediation projects from the conceptual phase to implementation. Other projects include a variety of Waste Management Licences, Atmospheric Emissions Licences, other EIA's and Environmental Audits. Moreover, emission sampling and reporting forms a core component of Karien's scope of work.

Karien is also a registered Natural Science Professional with the South African Council for Natural Scientific Professions (Reg Nr 400114/14).

3. DESCRIPTION OF OPERATIONS

3.1. Location

The site is located at 24 Laub Street, New Centre, which is in the jurisdiction of the City of Johannesburg Metropolitan Municipality in the Gauteng Province (See Figures 1, 2 and 3). The proposed waste management activities will be undertaken at 24-26 Laub Street and 28-32 Laub Street, New Centre, in an industrial zoned area and is completely transformed by the existing industrial activities.

3.2. Property Description:

The site is located on:

- Erf 137 in New Centre, Johannesburg
- Erf 45, 47, 49 in New Centre, Johannesburg

Physical address: 24-26 and 28-32 Laub Street, New Centre, Johannesburg

The table below gives the coordinates of the site.

Table 1: Coordinates of the site for the proposed facility

Corner	Latitude	Longitude
A	26° 12' 57.69" S	28° 02' 47.75" E
B	26° 12' 58.83" S	28° 02' 47.68" E
C	26° 12' 58.94" S	28° 02' 49.39" E
D	26° 12' 58.98" S	28° 02' 49.39" E
E	26° 12' 59.02" S	28° 02' 50.23" E
F	26° 12' 59.03" S	28° 02' 50.24" E
G	26° 12' 59.09" S	28° 02' 51.07" E
H	26° 12' 58.39" S	28° 02' 51.10" E
I	26° 12' 57.88" S	28° 02' 51.14" E
J	26° 12' 57.78" S	28° 02' 49.46" E
K	26° 12' 58.15" S	28° 02' 49.45" E
L	26° 12' 58.09" S	28° 02' 48.58" E
M	26° 12' 57.73" S	28° 02' 48.60" E

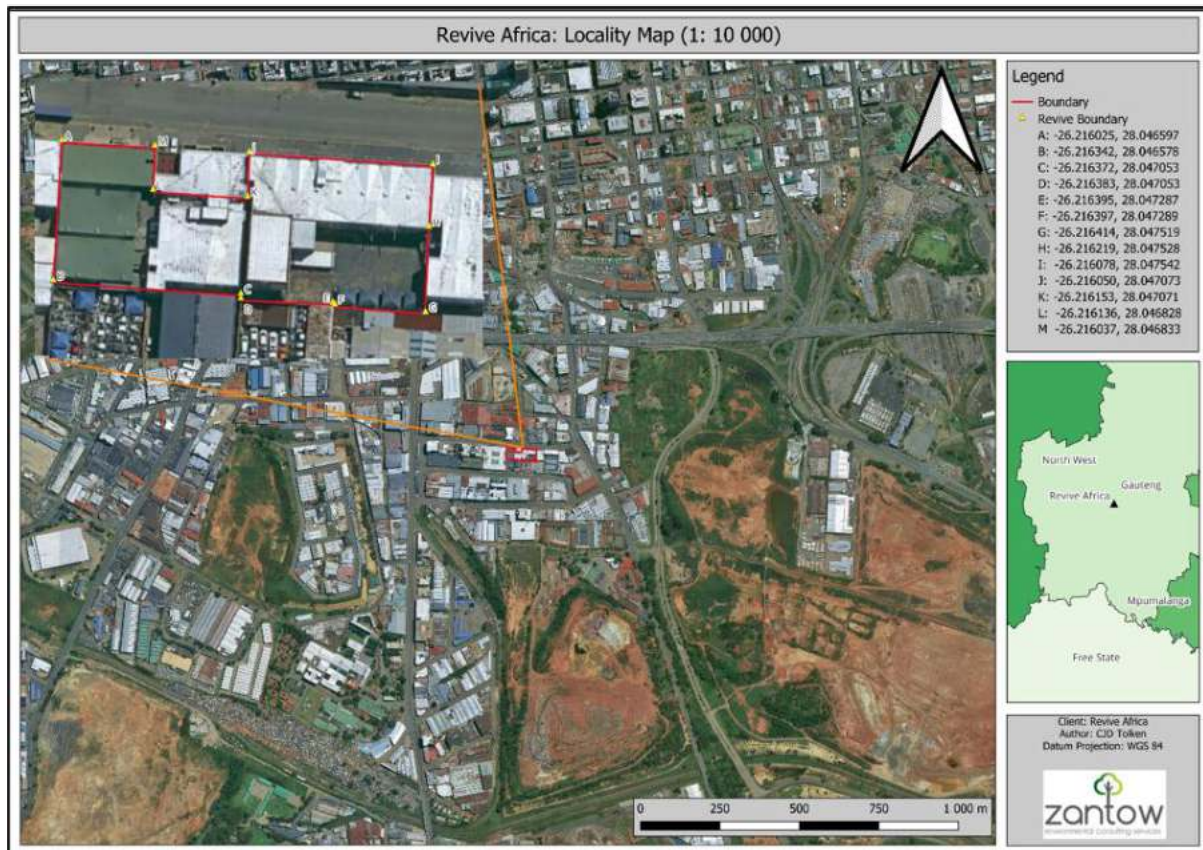


Figure 1: Property Location

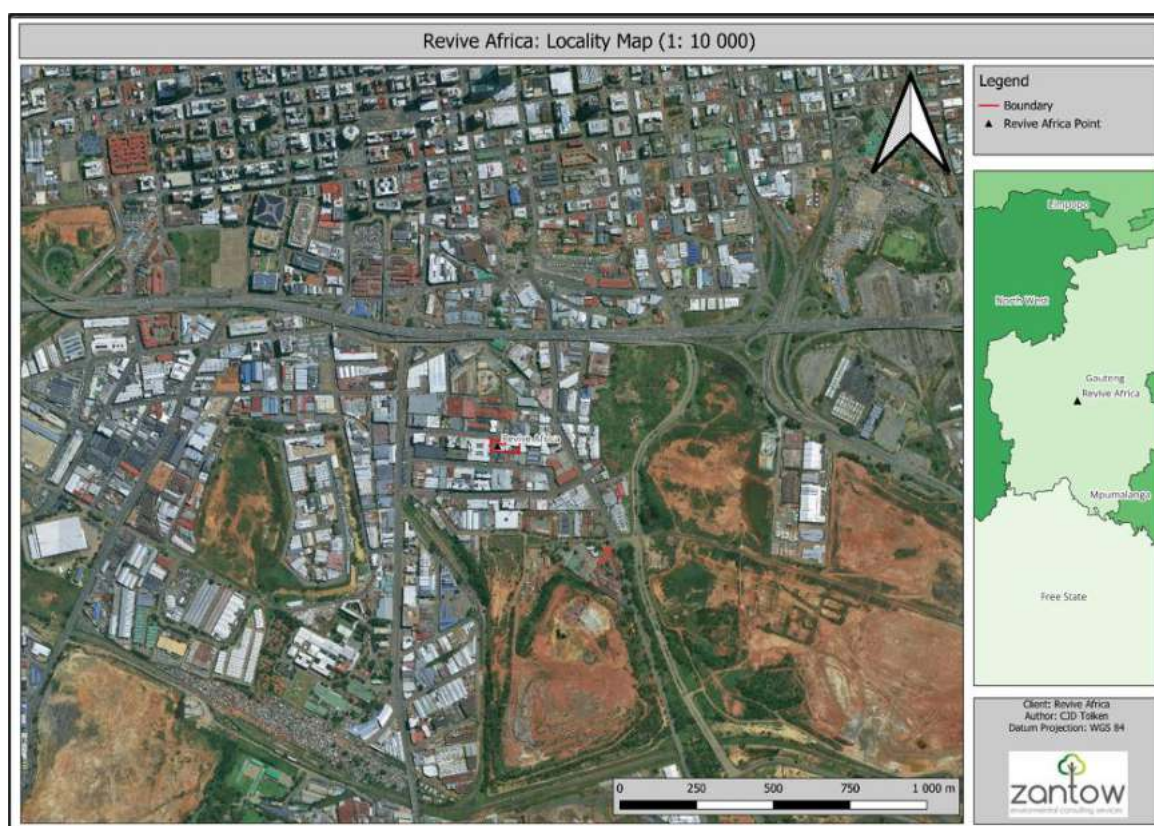


Figure 2: Location of the Revive Africa facility

3.3. Description of Recycling and Recovery Operations

Revive Africa currently undertakes the following activities:

- A. PCB Recycling Process - The manual depollution of PCBs.
- B. LIB Recycling Plant - The discharge of LIBs and recycling to black mass as well as the recovery of metals.
- C. Printer Cartridges – The trade, collection and shipment of empty printer cartridges.

The primary raw material in the production of finished products is e-waste, particularly ICT equipment and consumer electronics.

- Revive Africa currently processes waste in terms of the less than 500 kilograms of e-waste per day, requirement for not triggering a licence for both their PCB and LIB operations.
- The PCB recycling process is the main operation with a total of 96 306 kg collected and recycled since 2022.
- The LIB recycling processes were based on a trial basis to successfully discharge the batteries and recycle them to black mass with the purpose of extracting valuable metals such as Cobalt, Nickel and Lithium.

- The facility currently trades, stores and ships printer cartridges, since 2020 a total of 434 593 empty laser cartridges and 982 404 ink units have been kept out of landfill.

The proposed waste management activities entail the following activities:

- The planned PCB recycling facility will cover 1000 m², dedicated to e-waste storage, dismantling, and processing. The plant will be capable of processing 40-50 tons of PCBs per month and is expected to create at least 15 new jobs, depending on volume. PCBs will be collected, graded, and shredded and sold to upstream vendors for further processes.
- The battery recycling facility will occupy approximately 900 m², for battery storage, discharging, shredding, and screening. It will have the capacity to process up to four (4) tons of lithium-ion batteries per day. The process involves discharging batteries, shredding them into granulate, and screening the granulate to separate the black mass from plastic and copper residues. Comprehensive environmental and safety controls will be implemented to manage VOCs, fluorinated gases, and particulate emissions to ensure safe operations.

Structural changes to the Facility

The proposed waste management activities entail increasing the footprint of current operations to the adjacent building in 28-32 Laub Street, New Centre, Johannesburg for and e-waste management processes to include recycling, treatment and recovery of e-waste and LIBs.

4. OBJECTIVE OF THE EMPR

The overall objective of the EMPr is to provide Revive Africa with practical guidance for the environmentally and socially responsible management of the proposed waste management activities. This document provides appropriate mitigation measures designed to minimise or eliminate significant adverse environmental impacts that may result from project.

The specific objectives of this EMPr are to:

- Describe actions for implementing and maintaining mitigation measures to address the potential impacts identified in the BA process;
- Define organisational and administrative arrangements for environmental management and monitoring of the waste management activities at the facility;
- Ensure that site supervisory staff understand the recommended pro-active environmental management measures, so that potential problems can be identified, and mitigation measures adopted; and
- Define actions for environmental control, in the event of unexpected pollution.

4.1. Identified environmental aspects covered by the EMPr are as follows:

Indoor and Outdoor Air Quality

Mitigation and monitoring measures with the objective to achieve adequate control of emission generation associated with on-site activities in order to have acceptable impact on humans and the environment.

Waste management

Implementation of effective waste management practices to prevent environmental pollution and unnecessary disposal of waste streams. Effective and traceable records and documentation in order to assure waste generators whose waste are being handled, that waste is safely and responsibly recycled, recovered and or treated.

Surface water and soil pollution

Mitigation measures to prevent surface water and ground water contamination as a result of handling hazardous waste.

Resource use

Adequate management measures to minimise the use and promote the sustainable use of natural resources.

Socioeconomics

Measures to reduce the negative and enhance the positive socio-economic impacts during the construction, operation and decommissioning phases of the project.

4.2. Phases of the EMP

4.2.1. The Planning Phase

This EMP offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development. While there is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMP) during the planning phase, the necessary corrective action can be taken to further limit potential impacts.

4.2.2. The Construction Phase

The bulk of the impacts during this phase will have immediate effects (e.g. noise, dust and water pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts can then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from Revive Africa.

4.2.3. The Operational Phase

By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

4.2.4. The Decommissioning Phase

A generic approach has been included in the EMP for when Revive Africa intends to decommission the facilities. Revive Africa would however have to undergo an environmental authorisation process when decommissioning is planned.

4.3. Obligations and responsibilities

The obligations and responsibilities of Revive Africa, its contractors and its agents are described in this section.

Revive Africa has the overall responsibility to ensure that the activities undertaken at the facility are in accordance with the recommendations of the EMP as and when necessary, during the life cycle of the facility. It is the responsibility of Revive Africa to ensure that all contractors and agents adhere to the stipulations of the EMP.

Revive Africa undertakes to manage all operations in such a manner as to prevent or minimise adverse effects on the environment, reduce the risk of natural resource contamination and limit impacts on the surrounding community. In addition, Revive Africa must strive to maximise socio-economic benefits for

the area and protect the health and safety of employees, contractors, visitors and the general public. To this end, Revive Africa must:

- Ensure that the EMPr forms an integral part of the contract documents entered into with all contractors.
- Educate personnel, contractors and visitors with regards to general environmental, health and safety requirements applicable to the operations undertaken by Revive Africa and the content of the EMPr.
- Provide professional staff to give effect to its environmental management commitments.
- Appoint/designate a competent Environmental Control Officer (ECO) to oversee the implementation of the EMPr.
- The ECO will perform regular inspections to monitor compliance with the EMPr and provide results to the appropriate level of management within Revive Africa.
- The ECO will provide guidance on the remediation of any unplanned environmental impacts.
- The ECO will also motivate and facilitate any amendments to the EMPr as and when they become necessary.
- Monitor, evaluate and report performance in terms of safety, health and environmental strategies to the relevant management level within Revive Africa.
- Make employees related to the facility aware of the environmental risks pertaining to the activities associated with the operations of Revive Africa and inform them of the mitigation measures contained in the EMPr that are applicable to their scope of work.

4.4. Responsibilities

- **Operations Manager**

The Operations Manager will have the main responsibility to ensure that all contractors appointed throughout each phase of operation (construction, operation and closure) comply with the environmental management measures in this document.

In addition, the Operations Manager shall:

- Assume overall responsibility for the effective implementation and administration of the EMPr and the conditions and requirements of the WML;
- Ensure that the EMPr and the WML conditions are included in all contractor's contracts;
- Ensure that the applicable supervisor and contractors are provided with a copy of the WML and the latest approved version of the EMPr.

Furthermore, the duties of the operations manager include:

- Ensuring that the materials are being correctly delivered to the site and deposited at the correct storage point efficiently and safely.

- Ensuring that the site is kept clean and that cleaning schedules are adhered to.
- Ensuring that all plant and machinery are correctly operated and maintained in accordance with the manufacturer's specifications.
- Preventing any vehicle maintenance from being carried out on site, except in the designated workshop areas.
- Maintaining accurate records of all site activities, including the amounts and types of waste collected on a daily/weekly basis as well as accounts of any accident or injury occurring during operations.
- Report any significant environmental incident to Gauteng department of Agriculture to the relevant department as required by the license conditions.
- The Operations Manager will report the above back to the senior management on a regular basis, which will be used as part of the site management scheme.

- **Operations Supervisor**

The operations supervisor must report to the operations manager and will be responsible for the following aspects:

- Ensure compliance with the environmental requirements set in the EMPr;
- Brief the operational and maintenance staff about the requirements of the EMP;
- Advise the Management about the interpretation, implementation and enforcement of the EMPr;
- Conduct internal meetings;
- Undertake periodic audits of adherence to the EMPr;
- Report any significant environmental incidents to the Operations Manager;
- Respond to any complaints from the public.

- **Environmental Control Officer ("ECO")**

The ECO may be an appointee of Recite or an external party. The appointed ECO will be responsible for the implementation of the EMPr and ensuring compliance with the WML. In addition to this the ECO shall:

- Conduct regular site inspections, in conjunction with the Operations Supervisor to ensure that the operations undertaken by appointed contactors and Revive Africa employees are compliant with the EMPr and WML.
- Keep a register of all incidents (spills, complaints, injuries, legal transgressions etc.);
- Report any problems or complaints, which could not be resolved in collaboration with the Operations Supervisor to top Management;
- Ensure that monitoring takes place in accordance with the management measures outlined in the EMPr and the associated authorisations;

- Implement the recommendations made as a result of the annual independent environmental audits; and
- Ensure that all personnel are trained in accordance with the requirements outlined in the EMPr as well as the WML.

- **Scale operator**

- The scale operator will be responsible for:
- Ensuring that only approved and acceptable materials are brought onto the site.
- Ensuring that only approved personnel wishing to off load the appropriate materials are allowed onto the site.
- The Scale Operator will be trained to:
- Identify the material that is permitted onto the site;
- Inform the personnel where other material types that are rejected from this site may be appropriately and safely disposed of.

- **Cleaners**

The cleaners will be responsible for cleaning the facility on a pre-planned schedule. They will be required to remove all dust from all accessible surfaces and return spilled materials to the appropriate stockpile.

The cleaners will be trained to recognise the different materials anticipated on the site; and in the correct way of using cleaning agents, where applicable.

5. ENVIRONMENTAL MANAGEMENT PROGRAMME

The proposed project will follow a life cycle consisting of three phases, namely, construction, operation, and eventual closure. The different activities associated with the project, identified during the Impact Assessment, as well as the corresponding proposed mitigation measures are discussed in the following section.

Table 2: Objectives of Environmental Measures

Activity	Objective
Construction Activities	• Ensure that all necessary legal obligations and contractual conditions have been met prior to the construction commencement; and • Ensure that all role players and stakeholders are aware of the pending construction activities and have received timeous notice.
Water Management	• Effectively control storm water runoff to ensure no adverse impact on the surface or groundwater resources. • Ensure all hazardous waste activities occur on lined surfaces to avoid risk of groundwater contamination. • Operate the site according to the WML
Hazardous Substance Spills	• To ensure that hydrocarbon spills from plant and equipment occurring during all phases are suitably managed to reduce potential impacts on the environment.
Handling of waste	• To ensure that all sub-contractors responsible for delivering materials to site operate in an environmentally friendly manner whilst on site; and • To ensure that the activities related to material deliveries do not create any unnecessary impacts on the environment.
Waste Management	• To keep the construction site neat and clean; • Disposal of rubble and refuse in an appropriate manner; • Minimise neighbour complaints.
Fire Prevention	• Acceptable fire prevention measures as well as adequate fire response plans.
Designated Storage Areas	• To ensure that dangerous goods, hazardous materials and waste are properly stored so as to avoid accidents,

Activity	Objective
	spillage, and impacts to the environment.
Interaction with Landowners	• No damage to private property; and • Maintain good relations with neighbouring landowners.
Noise / Working Hours	• To ensure that noise is managed in such a way so that no legitimate complaints are received.
Safety	• Ensure the safety of personnel on site by ensuring adequate safety training and the use of Personal Protective Equipment ("PPE") at all times; and • Ensure that any construction areas or open trenches are clearly demarcated to avoid injury.

5.1. Environmental Management Programme for the Construction phase

Table 3: EMPr for the construction phase

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
1.	PLANNING						
Activities: Planning							
1.1	Improper planning leads to additional impacts that could have been avoided	Project Plan	Streamlined project execution	There must be sufficient facilities (plant materials) and resources (trained labour force) to ensure that the planned activities conform to both the license conditions and the Norms and Standards. For example, there should be sufficient trained staff to monitor, control and record incoming waste where required. The installation of the waste management equipment must be conducted by duly authorised service providers under supervision of a registered engineer.	Verify credentials before construction activities commence.	Operations Manager	Continuous
2.	SAFETY						
Activities: Health and Safety							
2.1	Occupational exposure impacting on personal health		Safe working conditions	All equipment used on site may only be operated by appropriately trained and / or licensed personnel.	Verify credentials before construction activities commence.	SHEQ Manager	Ongoing

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
2.2	and or wellbeing. Potential injuries	Prevention of personal injuries or health impacts on personnel		PPE and safety gear appropriate to the task being undertaken is to be provided to all site personnel (e.g. hard hats, safety boots, reflective vests, masks etc.).	Conduct regular inspections		
2.3				All personnel working on the project must operate in compliance with all safety measures as laid out in the Occupational Health and Safety Act (Act No. 85 of 1993) (OHSA).	Conduct regular occupational health and safety audits and inspections during construction.	SHEQ Manager	
3	WASTE						
Activities: Generation and management of waste							
3.1	Windblown litter – nuisance conditions	Eliminate or minimise pollution and nuisance conditions Correct waste management	Prevent wind-blown litter	All personnel, including external contractors must undergo a Safety Health and Environmental (SHE) training prior to the undertaking of work.	Training Records	SHEQ Manager and ECO	Upon commencement
3.2	Environmental pollution Incorrect handling, storage and disposal of waste leading to environmental pollution		Effective waste management practices Mixing of waste prevention	The SHE induction training must address the use and management of sanitation facilities (chemical portable toilets), general site management, housekeeping, waste management protocols and any other requirements set in the EMP.			
3.3			Appropriate waste handling and safe disposal	Littering is not permitted. All solid waste, rubble, scrap or building waste must be collected in separate, demarcated skips or bins.	Conduct regular inspections during construction	Operations Manager and ECO	Daily

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
3.4				Existing containment facilities may be used where a generated waste stream cannot be contained in a demarcated skips or bin until the material can be removed for re-use, recycling or safe disposal as appropriate.	Conduct regular inspections during construction	Operations Manager and ECO	Daily
3.5				Waste streams generated during the construction phase must be handled and stored in accordance with the Revive Africa Waste Management Procedure.			
3.6				All waste that cannot be recycling, re-used or recovered internally, must be disposed at licensed facilities.			
3.7				Material used to clean up spills must be regarded as hazardous and appropriately be disposed.			
3.8				Waste disposal certificates must be obtained for all hazardous waste disposed, and proper records must be kept on all waste leaving the premises.	Waste Manifest Documents / Safe Disposal Certificates	Operations Manager, Operations Supervisor and ECO	Weekly

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
4.	NOISE						
Activities: Construction activities							
4.1	Noise Pollution Occupational exposure	Non-exceedance of prescribed noise levels	Occupational exposure limits	Construction activities must be limited to operational hours between from 6AM to 6PM to minimise noise disturbance.	None	ECO Operations Manager, Operations Supervisor	Throughout construction
4.2				Equipment and machinery must be maintained as to limit excessive noise generation during construction phase.	Vehicle Inspections	Operations Manager, Operations Supervisor	Throughout construction
4.3				Employees or contractors working in high noise areas must be equipped with the appropriate PPE and hearing protection.	Exposure monitoring	SHEQ	Throughout construction
5.	AIR QUALITY						
Activities: Vehicle and machinery emissions and vehicle movement on unprepared surfaces							
5.1	Vehicle exhaust emissions - air	Minimise and limit emissions	None	All machines and vehicles must be well maintained to reduce the risk of excessive exhaust emissions.	Conduct regular inspections during construction	Operations Supervisor	Daily
5.2	pollution			Prohibit idling of vehicles when not in use.			
6.	SOIL AND SURFACE WATER						
Activities: Oil and diesel spillages from vehicles, storage and handling of hazardous substances							
6.1	Soil and stormwater		None	Contaminated rubble or soil must be stored in a			Throughout

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
6.2	contamination	Prevent soil and stormwater contamination		separate and demarcated area before being disposed of at a licensed landfill site.	Conduct regular inspections during construction	ECO and Operations Supervisor	construction
6.3				All construction vehicles and machinery must be properly maintained to prevent hydrocarbon leaks and spillages. Drip trays must be placed underneath parked vehicles, when parked for extended periods of time or where leaks have been identified.			
6.4	Soil and stormwater contamination- use of chemicals and Hydrocarbons	Prevent soil and stormwater contamination	None	All chemicals and hydrocarbons must be stored on an impermeable surface that is bunded.		ECO	
6.5				MSDS's of materials kept on-site must be readily available			
6.6				Spill-sorb or a similar absorption material must be kept on site and used to clean up hydrocarbon spills as and when it occurs.			
7.	GENERAL						
Activities: Construction activities and operations							
7.1	Damage to property Soil and water contamination	None	None	Proper and continuous liaison between Revive Africa, the contractors and stakeholders must be undertaken to ensure everyone is informed at all times;	Undertake quarterly internal audits	ECO and Operations Manager	When necessary

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
7.2	Air quality impacts			Documentation proving compliance to conditions or requirements of the EMPr or authorisations held by Revive Africa must be kept on file and made available to external auditors as and when requested.			
7.3	Non-compliance to legal requirements			Site inspections must be undertaken in order to monitor the progress of the construction activities as well as to identify any non-compliances to the EMPr or legal authorisations held by Revive Africa			
7.4	Inappropriate management of onsite activities			Relevant personnel must be appointed to implement this EMPr as well as deal with all stakeholder related matters.			
7.5				Quarterly internal audits must be carried out during the construction phase. All findings must be listed in a formal report which must be kept on file and made available to external auditors upon request.			

5.2. Environmental Management Programme for the Operational Phase

Table 4: EMPr for the operational phase

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
1.	SAFETY						
Activities: Health and Safety							
1.1	Occupational exposure impacting on personal health and or wellbeing. Potential injuries	Prevention of personal injuries or health impacts on personnel	Safe working conditions	PPE and safety gear appropriate to the task being undertaken is to be provided to all site personnel	Training Records	SHEQ Manager Operations Manager	Ongoing
1.2				All personnel, including external contractors working on site, must undergo a Safety Health and Environmental (SHE) training prior to the undertaking of work or at least on an annual basis.			
1.3				All personnel must receive regular relevant training on hazardous waste management as set out in the WML and Norms and Standards.			
1.4	Thermal runaway/ Fire from LIB processing			Ensure LIB recycling processes are conducted in a controlled environment.	Internal and External Audit Reports, Training and Maintenance Records	SHEQ Manager Operations Manager	Ongoing
				Ensure fire response equipment is provided and duly maintained.			
				Ensure that the fire risk assessment and emergency preparedness and response plan must be followed and all employees duly trained on how to handle thermal runaway from LIB processing.			
				Appropriate PPE must be provided to all employees.			

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
2.	WASTE						
Activities: Management of waste							
2.1	Incorrect handling, storage, recycling, recovery, and treatment of waste leading to environmental pollution	Eliminate or minimise pollution and nuisance conditions.	Effective waste management practices	Waste Management must be in line with the relevant South African legislation, regulations and or policies. Where not provided, waste must be recycled, recovered and or treated in terms of best practices	Internal and External Audit Reports Waste records	ECO	Ongoing
2.2		Correct waste management	Waste separations to promote recycling, recovery and treatment.	Waste storage must be managed in terms of the National Norms and Standards for the Storage of Waste.			
2.3		Correct waste management	Compliance to all environmental authorisations and the National Norms and Standards	Records must be in place for all waste received to be recycled, recovered and or treated.			
2.4		Prioritise recycling and re-use of waste material to prevent unnecessary disposal		Avoid mixing of waste that could lead to a reduced recyclability of the materials.			
2.5				Ensure processes are efficient and promote optimal recycling, recovery or treatment of waste.			
Activity: Management of waste generated on site							

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
2.6				Accurate and up to date records of waste generated on site must be kept and the records must reflect the method of management (disposal, reuse, recycling).			
2.7				Waste must be collected by a licenced service provider and disposed of at a licenced landfill site. Obtain safe disposal certificates from waste contractors for every load of hazardous waste transported and disposed of.			
2.8				Used oil must be stored in a bunded or concreted area in special containers and collected by a licenced services provider for disposal.			
2.9				Train employees on the handling of hazardous waste			
2.10				Waste must be separated (hazardous waste must be kept separate from general waste)			

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
2.11	Waste Storage and Handling (Raw Material)	Correct waste management Prevention of stormwater contamination	Compliance with WML and Norms and Standards	Waste must be stored in terms of the National Norms and Standards for the Storage of Waste. Implement good housekeeping practices at the storage area. Employees must be trained on the handling of waste. Spillages must be cleaned up immediately & spill kits must be readily available. Storage capacity must not be exceeded.	Inspect waste storage areas regularly. Training records.	ECO	Ongoing
3.	NOISE						
Activities: Processing activities							
3.1	Noise Pollution	Non-exceedance of prescribed noise levels	Occupational exposure limits	The proposed SHE Induction must include measures to address and minimise noise generation during the construction phase.	Conduct audits and inspections in line with the required timeframes set out in the relevant authorisations and or legal registrations.	ECO	Annually
3.2	Occupational exposure					ECO Operations Manager	

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
3.3				Equipment and machinery must be maintained in a good working order.	Spot checks and vehicle inspection logs	Operations Supervisor Operations Manager	Daily
3.4				Employees or contractors working in high noise areas must be equipped with the appropriate PPE and hearing protection.	Spot checks, PPE registers and internal auditing	SHEQ	Quarterly
4.	AIR QUALITY						
Activities: Vehicle Movement, emissions from exhausts							
4.1	Vehicle emissions-loading and offloading of goods	Minimise vehicle emissions	None	Vehicles must not idle when not in use.	Inspect Vehicles Regularly	ECO	Ongoing
4.2				Vehicles must be well maintained			
Activities: Fumes and other atmospheric emissions from waste recycling, recovery and treatment							
4.3	Fumes and Emissions	Minimise fume emissions	Acceptable indoor air quality as well atmospheric emissions	All operations are conducted in enclosed, sub-pressure systems	Inspect Extraction systems as per OEM requirement. Conduct preventative maintenance on the extraction systems as	Operations Manager & Operations Supervisor	Throughout project life time
4.4				Extraction and abatement must be installed at all unit processes where dust, fumes or emissions can be generated at significant rates.			Throughout project life time

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
4.5				Ensure maintenance is conducted on extraction systems	prescribed by the OEM, but at least annual Maintenance		Annually
4.6				Conduct Regular inspections on all systems to ensure that they are operating efficiently			
Activities: Dust and other atmospheric emissions from material handling and processing							
4.7	Raw material storage area	Minimise potential dust generation	None	Waste must be stored inside the building	Conduct Regular Inspections	Operations Manager & Operations Supervisor	Ongoing
4.8				Material must be stored in enclosed containers			
4.9				When tubes shatter, powder spills must be cleaned up immediately to prevent fugitive dust emissions			
5.	SURFACE WATER AND SOIL						
Activities: Oil and diesel spillages from vehicles, storage and handling of hazardous substances.							
5.1	Contamination with fuels, lubricants, and hydraulic fluids from vehicles	Prevent water contamination	Prevent pollution of surface water.	Spills must be reported as per Revive Africa' s incident procedure	Inspect stormwater channels to detect litter ingress.	Operations Supervisor and ECO	Ongoing
5.2				Employees must be appropriately trained to handle spills			
5.3				A spill kit must be readily available			
5.4				Absorbent material used to clean spills must be treated as hazardous waste,	Conduct inspections to identify any spills		
Activities: Raw material storage							
5.5	Surface and ground water contamination	To avoid contamination of water resources	No contamination on and off site	All hazardous substances storage tanks must be stored in a bunded area designed to contain 110% of the tank's capacity or 25% of the total capacity if multiple tanks are stored.	Inspect bunds regularly.	Operations Manager, Operations	Weekly

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
5.6				A spill kit must be available to clean up spillages.	Inspect spill kits regularly	Supervisor and ECO	
5.7				Large spillages must be reported and handled according to the facility's incident management procedure.	Conduct inspections to identify any spills		Ongoing
Activities: Storage and Handling of Lighting Waste							
5.8	Stormwater water contamination	Avoid contamination of stormwater	No contamination on and off site	Storage and Handling of lighting waste must be handled with care, to ensure that the lamps do not shatter	Ensure training on the handling of lighting waste is conducted	Operations Manager	Annually
5.9				Employees must be properly trained on the handling of the lamps on-site			
5.10				In the event of breakage any residue or powder released must be swept up immediately to prevent stormwater contamination	Ensure training on use of spill kits are conducted		
5.11				A spill kit must be readily available, and employees must be appropriately trained on how it is to be used			
7.	USE OF NATURAL RESOURCES						
Activities: Water, Electricity, and other Natural Resource Consumption							
7.1	Wasteful use and resources like water	Prevent wastage of natural resources	Minimum impact on natural resources	No running taps to be left unattended. Switch off lights when not in use.	None	ECO	Duration of Operational Phase
7.2	and electricity leads			Maintenance of water infrastructure.			

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA (TARGETS)	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PERSON / PARTY	TIME-FRAME
7.3	to unnecessary impacts on national resources.			Investigate energy saving mechanisms such as energy saving lights.			
10.	Socio-Economic						
Activities: Availability of employment opportunities							
9.1	Contribution to local economic development	Maximise benefit to local community	Appointment of local employees and contractors	Appoint local contractors and employees as far as reasonable possible.	None	ECO	Duration of Operational Phase
9.2				Investigate and implement Local Development projects to contribute to local communities.			
9.3				Participate in community forums where available or applicable			

5.3. Environmental Management Programme for the Decommissioning and Closure Phase

Table 5: EMPr for the decommissioning and closure phase

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PARTY	TIME-FRAME
1.	AIR QUALITY						
Activities: Emissions to the atmosphere							
1.1	Vehicle exhaust emissions - air pollution	Prevent emissions	None	All vehicles to be maintained in good working order to keep their atmospheric emissions under control.	None	Contractor	During closure phase
1.2				Prohibit idling of vehicles when not in use			
1.3				Employ effective dust control measures during decommissioning.			
2.	STORM WATER						
Activities: Hydrocarbon management							
2.1	Storm water pollution	Prevent spillages	None	Place drip trays beneath parked vehicles.	None	Contractor	During closure phase
2.2				Spill kits must be available and train relevant employees to respond to spills.			
2.3				Adequate maintenance of equipment to prevent spills.			
3.	WASTE MANAGEMENT						
Activities: Waste generation							
3.1	Windblown litter	Eliminate or	Prevent wind-	Store general waste in a designated area, designed to prevent wind-blown litter		Contractor	During closure

REF NR	POTENTIAL IMPACT	OBJECTIVES	PERFORMANCE CRITERIA	MITIGATION MEASURE(S)	MONITORING AND INSPECTIONS	RESPONSIBLE PARTY	TIME-FRAME
3.2	– nuisance conditions	minimise pollution and nuisance conditions	blown litter Effective waste management practices	Ensure that all general waste and building rubbles is removed and disposed of at a licensed general waste disposal site.	Inspect waste storage area regularly to ensure good house keeping		phase
3.3	Aesthetic impacts	Correct waste management		Use only licenced contractors			
3.4				Store building rubble in a designated area			
3.5	Soil, water and air pollution, human health risk	Eliminate or minimise pollution and health risk	Visual and documentary confirmation of correct disposal	Hazardous waste generated during decommissioning activities must be removed and disposed of at a licensed hazardous waste site and the safe disposal certificates kept on file for at least 5 years.	Inspection of waste storage areas to ensure good housekeeping and to detect spillages	Contractor	During closure phase
4.	SOCIAL						
Activities: Employment opportunities							
4.1	Loss of employment opportunities when site closes	- To benefit the local economy - To mitigate the impacts on employees and the local economy	None	Engagement with employees in advance Redistribute employees to other operational units as far as possible	None	Contractor	During closure phase

6. DOCUMENT RETENTION AND RECORD KEEPING

According to accepted international standards sufficient records shall be established and maintained to provide evidence of conformity to requirements and the effective operation of the relevant management systems throughout each phase of operation. Records shall remain legible, readily identifiable and retrievable in all appropriate areas to demonstrate conformance to requirements and to have an audit trail, which to verify the effective operation of Environmental Management.

Documents generated and used during each phase of operation as set out in tables 3, 4 and 5 above must be managed in accordance with the proposed measures set out below.

6.1. Hard copy retention schedule

Table 6: Document Retention Procedure

IDENTIFICATION OF RECORDS	RETENTION TIME		
	ACTIVE	HISTORY	RECORDS
Monitoring and measuring data	20 years	10 years	10 years
Disposal Certificates	20 years	10 years	10 years
Reports with State Departments	Indefinite	Indefinite	Indefinite
Corrective Action & Verification Forms	24 month's records	13 – 24 Months	5 years
Internal Audit Reports	24 month's records	13 – 24 Months	5 years
External Audit Reports	20 years	10 years	10 years
Copies of legal appointment letters	Valid period	10 years after cancellation	10 years after cancellation
Documents demonstrating compliance to WML and EMP conditions	Valid period	5 years	5 years

6.2. General requirements

- Any non-compliances to the requirements of the EMP or Legal Authorisations held by Revive Africa must be reported to the relevant authorities within 48 hours.
- All documents shall be kept on site and be available for monitoring and auditing purposes.
- An Environmental auditor may require access to documentation for auditing purposes when site visits are conducted.
- The documentation shall be signed by all parties to ensure that such documents are legitimate.

- Regular monitoring of all site works by the Site Manager, Operations Manager, ECO and SHEQ Manager is imperative to ensure that any problems encountered are resolved punctually and amicably.
- When the Site Manager is unavailable, the ECO shall be kept up to date by the Operations Manager on all works to ensure no problems arise.

Data management, record keeping and reporting to be conducted in terms of requirements and frequencies specialized by the relevant licence authorisation or permits.

7. MONITORING PROGRAM

A monitoring programme will be in place not only to ensure conformance with the EMP, but also to monitor any environmental issues and impacts which have not been accounted for in the EMP that are or could result in significant environmental impacts for which corrective action is required. Revive Africa will stipulate the period and frequency of monitoring required. This will be determined in consultation with relevant stakeholders and authorities.

The following monitoring and auditing schedules are proposed for the project and Revive Africa should incorporate the monitoring and auditing requirements into their EMS;

Table 7: Monitoring Program

Frequency	Monitoring applicable	Details of monitoring
Waste management		
Daily	Waste stream monitoring	• Date and time of entry into facility • Origin of each waste stream • Type and Classification of the waste stream • Volumes that were processed
	Duty of Care and Health and Safety – accidents and incidents	• Register all incidents. • Register all complaints. • Mitigation and preventative measures • Further actions to be monitored
Air quality		
Biennially	Occupational exposure	• Exposure monitoring in terms of the OHS act

7.1. Non-Conformance and Corrective Action

The monitoring of the operations at the site may identify non-conformances of the EMP. Non-conformances may also be identified through incidents, emergencies or complaints. In order to correct these non-conformances, the route course must be determined, and corrective actions must be identified.

8. TRAINING AND AWARENESS

It is important to ensure that all personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental harm. To achieve effective environmental management, it is important that employees, Contractors and Subcontractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMP.

The objectives of an Environmental Awareness Plan are to:

- Inform employees and contractors of any environmental risks which may result from their work;
- Inform employees and contractors of the manner in which the identified possible risks must be dealt with in order to prevent degradation of the environment; and
- Optimise the awareness of those involved in the plant upgrade (construction) and operational activities which have the potential to impact negatively on the environment (e.g. oil leaks or spillages from equipment), and in doing so, promote the global goal of sustainable development.

8.1. Implementation

Environmental principles regarding the construction and operation of the proposed plant establishment will be communicated to the contractor and its team (if construction will be undertaken by an external party), any newly appointed employees and visitors entering the construction and/or plant area to conduct work.

8.2. Content of environmental awareness plan

Key elements of the environmental awareness plan that will be presented at inductions include:

- Revive Africa's vision and policy;
- An explanation of sustainability;
- Surface and groundwater management;
- Air quality and odour management;
- Energy conservation;
- Waste management;
- The community and interested and affected parties;
- Reporting incidents; and
- Employee responsibilities.

9. EMERGENCY PREPAREDNESS PLAN

The current Revive Africa SA emergency response plan will remain relevant during construction and operation and should any activity, not covered by this plan, be conducted by the contractor it will be the contractor's responsibility as part of his method statement to include an emergency response for that particular activity.

The plan is updated as per the requirements on a regular interval, and the reader should always ensure that they have the latest copy at hand.

10. CONCLUSION

The successful implementation of this EMPr and its management actions will ensure that compliance with the environmental legislative requirements are achieved and that the likelihood of impacts occurring is reduced sufficiently. This EMPr also outlines the required environmental awareness training of employees, supervisors, contractors and visitors, which will ensure that management of the environment will occur through cooperation.

The success of this EMPr and overall sustainability of the project will further increase as a result of the defined organisational and administrative arrangements for environmental management and monitoring of the proposed project as well as procedures for environmental control, in the event of pollution (spillage) or similar events requiring action.

PROCEDURE APPROVAL RECORD

Procedure Name:

Environmental Management
Program

Revision Nr:

001

Replace Revision Nr:

N/A

RECORD OF REVISIONS AND ISSUES REGISTER

Date	Revision	Description	Issued to	Drafted by

Authorised by:

Fergus Slattery

Approval Signature:

--

Annexure J

Public Participation Report

To be Included in Final Environmental Impact Report

Annexure K

Site Layout

Revive Africa: Existing Facility Layout



Legend

- ▲ Revive Africa Point
 - Existing Facility
 - Receiving Areas
 - ▲ Existing Boundary
- A: -26.216025, 28.046597
B: -26.216342, 28.046578
C: -26.216372, 28.047053
K: -26.216153, 28.047069
L: -26.216136, 28.046828
M: -26.216036, 28.046833



Client: Revive Africa
Author: CJD Tolken
Datum Projection: WGS 84

Revive Africa: Proposed Facility Layout

Legend

▲ Revive Africa Point

— Boundary

▲ Revive Boundary

A: -26.216025, 28.046597

B: -26.216342, 28.046578

C: -26.216372, 28.047053

D: -26.216383, 28.047053

E: -26.216394, 28.047286

F: -26.216397, 28.047289

G: -26.216414, 28.047519

H: -26.216219, 28.047528

I: -26.216078, 28.047539

J: -26.216050, 28.047072

K: -26.216153, 28.047069

L: -26.216136, 28.046828

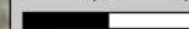
M: -26.216036, 28.046833



Client: Revive Africa
 Author: CJD Tolken
 Datum Projection: WGS 84



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Annexure L

Norms and Standards Registration



**forestry, fisheries
& the environment**

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001, Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: +27 86 625 1042

Ref No.: 12/9/11/ST574/3

Enquiries: Ms. Cynthia Baloyi

Tel: (012) 399 9523. **Email:** cybaloyi@dffe.gov.za

www.dffe.gov.za

CF Africa Trading Pty Ltd t/a Revive Africa
24-32 Laub Street
New Centre
JOHANNESBURG
2001

Email: fergus@reviveafrica.co.za

Dear Fergus Slattery

REGISTRATION OF A WASTE STORAGE FACILITY FOR CF AFRICA TRADING PTY LTD T/A REVIVE AFRICA, LOCATED AT 24-32 LAUB STREET, NEW CENTRE, JOHANNESBURG, CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE.

The Department acknowledges receipt of the Registration Form for storage of waste for CF Africa Trading Pty Ltd t/a Revive Africa, on 27 June 2026, to store the following waste stream classification type: E-Waste, Batteries, Packaging Waste(Plastics & Cardboards) and Metals (Ferrous and Nonferrous).

The Facility complied with the registration requirements and is hereby registered with Registration Number **12/9/11/ST574/3**. You are therefore required to comply with **Norms and Standards for Storage of Waste in terms of GN 926 of November 2013**.

Should you require further detailed information, please do not hesitate to contact this office.

Yours sincerely

LETTER SIGNED BY: MS. MISHELLE GOVENDER

DESIGNATION: CHIEF DIRECTOR: HAZARDOUS WASTE MANAGEMENT AND LICENSING

DATE: 29 July 2026



Batho pele – putting people first

Departement van Bosbou, Visserie en die Omgewing • Department of Forestry, Fisheries and the Environment • UmNyango wezamaHlathi, zokuThiya neBhoduluko • iSebe lezamaHlathi, ezokuLoba noKusingqongileyo • Umnyango WezamaHlathi, Ezokudoba Nezemvelo • Kgoro ya Dithokgwa, Boreahlapi le Tikologo • Lefapha la Meru, Botshwasi ba ditlhapi le Tikoloho • Lefapha la Dikgwa, Ditlhapi le Tikologo • Litiko Letemahlatsi, Tinhlanti Netendzawo • Muhasho wa zwa Vhusima-maḡaka, Vhureakhovhe na Mupo • Ndzawulo ya Swihlahla, Vunjoveri na Mbango. The processing of personal information by the Department of Forestry, Fisheries and the Environment is done lawfully and not excessively for the purpose of processing in compliance with the POPI Act, any codes of conduct issued by the Information Regulator in terms of the POPI Act, and/or relevant legislation providing appropriate security safeguards for the processing of personal information of others.

Annexure M

Scoping Report Acceptance



forestry, fisheries & the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001, Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: +27 86 625 1042

Ref No: 12/9/11/L260623131323/3/N

Enquiries: Mrs. Cynthia Baloyi

Tel: 012 399 9523 **Email:** cybaloyi@dffe.gov.za

www.dffe.gov.za

Zantow Environmental Consulting Services CC

PO Box 3858

VAN DER BIJLPARK

1910

Email: karien@zantow.co.za

Dear Ms. Karien Zantow

ACCEPTANCE LETTER OF A FINAL SCOPING REPORT (FSR) FOR THE PROPOSED ELECTRONIC WASTE RECYCLING, RECOVERY AND TREATMENT FACILITY FOR REVIVE AFRICA LOCATED IN NEW CENTRE, CITY OF JOHANNESBURG, GAUTENG PROVINCE.

The Department confirms receipt of the Final Scoping Report (FSR) for a waste management licence application submitted by Zantow Environmental Consulting Services CC on behalf of Revive Africa on 14 July 2026.

The Department has evaluated the submitted FSR and it is satisfied that it complies with the minimum requirements of the Scoping Report in accordance with Appendix 2 of the EIA Regulations, 2014 (as amended). The FSR is hereby accepted by the Department with the following conditions:

1. The Environmental Impact Assessment process must be undertaken in line with Appendix 3 of Government Notice R 982 of the EIA Regulations, 2014 (as amended). Prior to the submission of the final Environmental Impact Assessment Report (EIAR), the draft EIAR must be submitted to the Department for comments as part of the 30 day public participation process.
2. The EIAR must include the draft Environmental Management Programme (EMPr) as indicated on item 10.10 of this report. The draft EMPr to be developed must comply with Appendix 4 of Government Notice R 982 of the EIA Regulations 2014 (as amended).



Batho pele – putting people first

Departement van Bosbou, Visserye en die Omgewing • Department of Forestry, Fisheries and the Environment • UmNyango wezamaHlathi, zokuThiya neBhoduluko • iSebe lezamaHlathi, ezokuLoba noKusingqongileyo • Umnyango WezamaHlathi, Ezokudoba Nezemvelo • Kgoro ya Dithokgwa, Boreahlapi le Tikologo • Lefapha la Meru, Botshwasi ba diithapi le Tikoloho • Lefapha la Dikgwa, Dithapi le Tikologo • Litiko Letemahlatsi, Tihlanti Ntendzawo • Mhasho wa zwa Vhusima-magaka, Vhureakhoyhe na Mupo • Ndzwawulo ya Swihlahla, Vunjoveni na Mbango. The processing of personal information by the Department of Forestry, Fisheries and the Environment is done lawfully and not excessively for the purpose of processing in compliance with the POPI Act, any codes of conduct issued by the Information Regulator in terms of the POPI Act, and/or relevant legislation providing appropriate security safeguards for the processing of personal information of others.

ACCEPTANCE LETTER OF A FINAL SCOPING REPORT (FSR) FOR THE PROPOSED ELECTRONIC WASTE RECYCLING, RECOVERY AND TREATMENT FACILITY FOR REVIVE AFRICA LOCATED IN NEW CENTRE, CITY OF JOHANNESBURG, GAUTENG PROVINCE.

You may proceed with the Environmental Impact Assessment process in accordance with the tasks contemplated in the Plan of Study for Environmental Impact Assessment as required in terms of the EIA Regulations, 2014 (as amended).

Please draw the applicant's attention to the fact that the activity must not commence prior to a waste management license being granted by the Department.

Should you wish to correspond further on this matter, please quote Reference: 12/9/11/L260623131323/3/N. Enquiries may be directed to the contact person highlighted at the top of this correspondence.

Yours sincerely



Mr. Matjelele Phaladi

DESIGNATION: DIRECTOR: LICENSING

DATE: 07 / 08 / 2026

Annexure N

Waste Management Plan

WASTE MANAGEMENT PLAN			
Number:	4382-ZANREV-2026	Authorised:	F Slattery & K. Zantow
Revision:	00	Issue Date:	31 July 2026

WASTE MANAGEMENT PLAN

Document reference 4382-ZANREV-2026



Revive Africa (Pty) Ltd
24 Laub Street
New Centre
Johannesburg
2001

REPORT STATUS	PRPARED BY	REVIEWED AND APPROVED BY
Revision 00 July 2026	Zantow Environmental Consulting Services CC On behalf of CF Africa Trading	Karien Zantow Zantow Environmental Consulting Services CC Fergus Slattery CF Africa Trading t/a Revive Africa

WASTE MANAGEMENT PLAN			
Number:	4382-ZANREV-2026	Authorised:	F Slattery & K. Zantow
Revision:	00	Issue Date:	31 July 2026

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WASTE MANAGEMENT PLAN			
Number:	4382-ZANREV-2026	Authorised:	F Slattery & K. Zantow
Revision:	00	Issue Date:	31 July 2026

1. SCOPE

The purpose of this Waste Management Plan (WMP) is to ensure that all waste generated, received, stored, handled and processed by CF Africa Trading t/a Revive Africa shall be managed, controlled, monitored and disposed of in a safe manner without risk to human health, safety and the environment. All employees, contractors and or subcontractors who perform work on the Revive Africa site or on behalf of Revive Africa are required to abide by the regulations set out in this procedure. All employees, contractors and or subcontractors are to be made aware of the procedure content, site rules and relevant regulations pertaining to waste and waste management on site.

This procedure has been drafted in line with requirements set out in the National Environmental Management: Waste Act, 59 of 2008 as well as relevant provincial and municipal regulations and by-laws and is aimed at ensuring legal compliance in terms of waste management at Revive Africa.

This procedure provides a guideline for the correct management of all waste streams associated with all activities undertaken by Revive Africa.

2. REVISION OF THE WASTE MANAGEMENT PROCEDURE

This procedure shall be reviewed every two (2) years by the site's Management and the Environmental Control Officer (ECO), or more frequently if required, and revised as appropriate.

3. OBJECTIVE

The objectives of this WMP are to ensure that Revive Africa:

- Complies with all relevant National, Provincial and Local legislations;
- Prevents pollution as far as reasonably possible;
- Identifies, classifies and manages the different types of waste generated during operations in accordance with relevant legislation requirements;
- Assigns responsibility for implementation and management of the Waste Management Plan; and
- Implement duty of care which is the cornerstone for waste management at Revive Africa.

4. REFERENCES AND RELATED PROCEDURES

- ISO14001:2015 Environmental management systems - requirements
- Waste Management License (Ref Nr: 12/9/11/L260413152509/3/N)
- Registration in terms of the National Norms and Standards for the Storage of Waste (Reg Nr: 12/9/11/ST574/3)
- City of Johannesburg Waste Management By-laws, 2021

5. RECORDS

- Waste Inventory
- Waste Manifest Documents
- Weight records and or register.

WASTE MANAGEMENT PLAN			
Number:	4382-ZANREV-2026	Authorised:	F Slattery & K. Zantow
Revision:	00	Issue Date:	31 July 2026

6. DEFINITIONS AND ABBREVIATIONS

In terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (as amended) (NEM: WA), the following definitions are applicable:

Building and demolition waste	means waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any structure and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition
Business waste	means waste that emanates from premises that are used wholly or mainly for commercial, retail, wholesale, entertainment or government administration purposes.
Disposal site	means a site used for the accumulation of waste with the purpose of disposing or treatment of such waste and registered according to legislation for specific types of waste
Domestic waste	means waste, excluding hazardous waste, that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes.
ECO	means Environmental Control Officer.
General waste	means waste that does not pose an immediate hazard or threat to human health or to the environment, and includes— a) Domestic waste; b) Building and demolition waste; c) Business waste; and d) Inert waste.
GWIS	Means the Gauteng Waste Information system
Hazardous waste	means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.
Inert waste	means waste that— a) Does not undergo any significant physical, chemical or biological transformation after disposal; b) Does not burn, react physically or chemically biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact; and c) Does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant.
Recycle	means a process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material.
Re-use	means to utilise articles from the waste stream again for a similar or different purpose without changing the form or properties of the articles.

WASTE MANAGEMENT PLAN			
Number:	4382-ZANREV-2026	Authorised:	F Slattery & K. Zantow
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Recovery means the controlled extraction or retrieval of any substance, material or object from waste.

Treatment of waste means any method, technique or process that is designed to-

- a) change the physical, biological or chemical character or composition of a waste; or
- b) remove, separate, concentrate or recover a hazardous or toxic component of a waste; or
- c) destroy or reduce the toxicity of a waste,
- d) in order to minimise the impact of the waste on the environment prior to further use or disposal;

Waste means any substance, whether that substance can be reduced, re-used, recycled and recovered –

- a) which the generator has no further use of for the purposes of production;
- b) that must be treated or disposed of; or
- c) that is identified as a waste by the Minister by notice in the Gazette and includes waste generated by the mining, medical or other sectors, but—
 - i. a by-product is not considered waste; and
 - ii. any portion of waste, once re-used, recycled and recovered, ceases to be classified as waste.

Waste disposal facility means any site or premise used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premise.

Waste transporter means any person who conveys or transfers waste:

- a) Between the waste generator and a waste management facility; or
- b) Between waste management facilities.

WMP means Waste Management Plan.

WASTE MANAGEMENT PLAN			
Number:	4382-ZANREV-2026	Authorised:	F Slattery & K. Zantow
Revision:	00	Issue Date:	31 July 2026

7. APPLICABLE LEGISLATION AND REGULATIONS

- NEM: Waste Act
- National Waste Information Regulations (GN R.625 of 2012) – for GWIS reporting
- Waste Classification and Management Regulations (GN R.634 of 2013)
- Norms and Standards for Assessment of Waste for Landfill Disposal (GN R.635 of 2013)
- Norms and Standards for Disposal of Waste to Landfill (GN R.636 of 2013)
- National Environmental Management Laws Amendment Act update
- Extended Producer Responsibility (EPR) Regulations

8. ROLES AND RESPONSIBILITIES

8.1. Waste Management Control Officer

The Waste Management control Officer must:

- Ensure that relevant personnel are familiar with all requirements of the Waste Management Plan
- Ensure that relevant personnel are familiar with all requirements of the;
 - Waste Management License (12/9/11/L260413152509/3/N)
 - National Norms and Standards Registration (12/9/11/ST574/3)
 - Approved Environmental Management Program (dated August 2026)
- Undertake required internal inspections and audits to enable proper management of the site.
- Ensure that required waste records are recorded, i.e. waste received, processed, generated and removed.
- Ensure that all records confirming waste removed from site is filed and recorded.
 - Records must confirm the waste type removed, date of removal, details of the relevant transporter, details of the final destination and details regarding the waste management measure (i.e. treatment, disposal, recycling or recovery).
- Report any deviations from the approved operational plans and procedures in terms of relevant authorisations.
- Ensure that the external monitoring audit reports are conducted according to the requirements set out in the sites Waste Management Licenses and Environmental Authorisations.
- Implement routine training of employees and operators to ensure awareness with regards to waste management principles on site.
- Ensure to keep up to date records demonstrating compliance in terms of relevant authorisations.
- Record and investigate incidents in terms of the incident investigation procedure
- Record, investigate and manage external complaints in terms of the external complaints handling procedure
- Investigate optimisation of waste streams to determine additional usage (reduce / re-use / recycle / dispose)
- Ensuring the transporter / recycler / re-user / landfill site is licensed (Waste Management Licence) and providing the ECO with the applicable documentation.
- Managing of third-party waste management contracts.
- Ensure sufficient waste bins, skips or bulk containers are available on site.
 - The design of the bins skips, or bulk containers must ensure containment to prevent seepage, and must be covered to prevent water ingress and must be placed on impermeable surfaces within bunded areas.
- Conduct monthly inspections to investigate waste management practices on-site and report any incidences.

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8.2. Maintenance Department

The maintenance department is responsible for the maintenance and upkeep of all plant infrastructure and equipment. In addition to the responsibilities of the Waste Management Control Officer, the Maintenance Department must;

- Ensure that equipment checks and maintenance is undertaken as per industry or manufacturer approved standards and the preventative maintenance plan.
- Provide copies and records of maintenance, repairs and services on equipment or infrastructure to the Waste Management Control Officer for auditing purposes.
- Report any equipment or machinery malfunctions or failures to the Waste Management Control Officer upon occurrence.
- Assist with investigations following an incident or external complaint as and when so required.

8.3. Operations Manager

The operations manager must:

- Report any planned changes, deviations or alterations to plant infrastructure, equipment or operations which would result in an increase in production capacity, generation of a new waste stream or impact on the environment.
- Ensure to report all incidents to the Waste Management Control Officer upon occurrence.
- Provide assistance to the Waste Management Control Officer during audits, incident or complaint investigations when so needed.
- Provide assistance to the Waste Management Control Officer during an emergency situation as and when so required.

9. WASTE MANAGEMENT AT REVIVE AFRICA

9.1. Waste Hierarchy

The principal strategy adopted by Revive Africa shall follow the hierarchy of waste management. The key objective shall be to reduce waste generation by the facility. For certain processes, during which waste reduction is not feasible, the Company shall explore opportunities to re-use, recycle and / or treat waste, with the final option being disposal via reputable contactors and at duly authorised landfill sites.



Figure 1: Waste Hierarchy

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9.2. Transportation of Waste

- The collection and transportation of waste must be done according to Sections 24 and 25 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (as amended) (NEM: WA) as well as Section 59 of the City of Johannesburg Waste Management By-Laws, 2021.
- Transporters of waste must have a system in place to report and respond to loss of containment during transit.
- The transporters of waste must be registered on the Gauteng Waste Information System (GWIS) and with the City of Johannesburg as a waste removal service as applicable.
- Revive Africa will ensure that transporters, as far as their control reaches, only utilises competent and licensed drivers; and
- Transporters of hazardous waste must be issued with the required documentation when collecting and transporting waste from Revive Africa.

9.3. Offloading Waste

Upon arrival at the facility:

- Vehicles shall report to the designated receiving area.
- Waste documentation shall be verified.
- All waste loads must be subjected to a quality control test prior to acceptance, and must be inspected for:
 - Contamination with oils, unknown chemicals or hazardous substances;
 - Radioactive electronic components;
 - Explosive or pressurised devices
- Waste shall be directed to the appropriate storage or processing area (when accepted).

a) Reject Loads:

- Unauthorised or waste which does not comply with the quality standards as determined by Revive Africa must be rejected and the load sent back to the supplier.
- Rejected loads must be recorded along with how the load was managed.

b) Accepted Loads

- Accepted waste loads must pass over the calibrated weigh scale and be recorded.
- The date, source, waste type as well as details of the transporter must be recorded and kept on file for auditing purposes.
- Before off-loading commences, the relevant checklists must be completed to ensure that safe off-loading will occur.
- Waste may only be off-loaded in a demarcated area, with a cement floor.

9.4. Storage of Waste Received and Accepted

The storage of waste at the must comply with the National Norms and Standards for the Storage of Waste (GNR 926, dated 29 November 2013), as well as Sections 21 and 22 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (as amended) (NEM: WA).

Measures must be taken to adhere to the following:

- The containers, in which any waste is stored, must be intact and not corroded, or in any other way, rendered unfit for the safe storage of the waste.

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- Pollution of the environment and harm to human health must be prevented from taking place.
- Nuisances such as odour, visual impacts and breeding of vectors must be prevented at all times.
- Inspect containers regularly to detect corrosion, damage and or potential leakages.
- Waste may not be stored for longer than 18 months prior to waste management measures taken.
- All containers (bins, skips or bulk containers) shall be kept in a clean and hygienic manner.
- Containers (bins, skips or bulk containers), utilised for the disposal of general and hazardous waste, must be demarcated accordingly.
- Ensure the monthly inspection checklist is completed.
- LIB storage containers must be located away from ignition sources and in well-ventilated areas with well-maintained emergency response equipment.

9.5. Storage of Generated Waste on Site

- Waste material may only be temporarily stored at areas demarcated for such storage.
- General waste shall be stored in a manner that prevents the harbouring of pests.
- General, recyclable and hazardous waste must always be stored and disposed of separately.
- General, recyclable and hazardous waste must be stored and disposed of in appropriately demarcated bins.
- Waste bins must be emptied into appropriately demarcated skips or bulk containers, once a week or more often, if required.
- Skips or bulk containers must be emptied and their contents removed on a regular basis by duly authorised recycling service providers or transported to a licensed landfill facility for disposal, where recycling is not feasible.
- No build-up or waste disposal is permitted onsite.
- No burning of waste is permitted.
- Waste bins and or containers must be appropriately labelled for the waste stream to be disposed therein.
- Safe disposal certificates and / or waste manifests (where applicable) must be requested from all waste removal service providers for all loads of waste removed from site.
 - The waste manifest must be signed by the Generator, Transporter and the final Waste Manager.
 - All waste manifests must be stored electronically and no load of waste from site may be paid for, without the receipt of the manifest documentation.
- Waste may only be disposed of at a licensed landfill site.
- Safe disposal certificates must be kept on file to illustrate compliance with the cradle to grave principle; and
- Hazardous waste may only be handled by a registered waste disposal company.

10. LIB FIRE PREVENTION MANAGEMENT PLAN

Lithium-ion batteries present specific risks due to:

- Thermal runaway;
- Flammable electrolyte;
- Internal short circuits;
- Mechanical damage;

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- Overcharging;
- Manufacturing defects.

Thermal runaway may result in:

- Rapid temperature increase;
- Release of toxic gases;
- Fire;
- Explosion;
- Propagation to adjacent batteries.

The facility shall implement the following controls:

- **Battery Inspection**

Incoming batteries shall be inspected for:

- Damage;
- Swelling;
- Leakage;
- Heat generation;
- Physical deformation.

Damaged batteries shall not enter normal processing streams. A dedicated quarantine area shall be provided for batteries that are:

- Damaged;
- Swollen;
- Leaking;
- Showing signs of thermal damage;
- Suspected of internal failure.

The quarantine area shall:

- Be clearly marked;
- Be separated from normal battery storage;
- Restrict unauthorised access;
- Have appropriate fire protection measures;
- Allow safe emergency intervention.

- **Battery Segregation**

Battery storage shall include segregation of:

- Intact batteries;
- Damaged batteries;
- Unknown battery types;
- Different battery chemistries where necessary.

- **Ignition Source Control**

The following controls shall be implemented:

- No smoking within operational areas;
- Control of hot works;
- Restriction of open flames;
- Electrical equipment maintained appropriately;

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- Good housekeeping practices

In the event of a battery overheating or entering thermal runaway the fire risk assessment and emergency preparedness and response plan must be followed.

11. SPILLS AND CONTAMINATION

- Waste spillages must be prevented as far as possible.
- Spillages must be contained and cleaned-up and as soon as possible.
- Employees must be trained on spill containment and response.
- Relevant spill management equipment (spill kits) and / or procedures must be available and implemented accordingly.
- Major spillages must be reported to the Waste Management Control Officer.
- In the case of a major spill, (i.e. an unexpected, sudden and uncontrolled release of a hazardous substance, that causes, has caused or may cause significant harm to the environment, human life or property) management must follow and adhere to the requirements of Section 30 of NEMA.

12. RECYCLING / RECOVERING OF E-WASTE

- Only employees with appropriate training must operate the facility.
- Conduct maintenance, as required, to keep the operational facility in a good working condition; and
- Records must be kept of e-waste recovered, recycled or traded and reported on the required GWIS reporting system, at the frequency as set out in the Regulations.
- No changes to the processing facility which may increase the current processing and or production capacity may be implemented or commissioned without prior approval and or relevant authorisations.
- No changes to existing infrastructure may be implemented without prior approval from relevant authorities and management.

An inventory of all waste generated and managed on the site must be maintained and records of waste management must also be maintained.

13. WASTE CLASSIFICATION

- Waste listed under Annexure 1 of GN 364 does not require classification in terms of SANS10234.
- Waste generated by Revive Africa not listed under Annexure 1 of GN 364 must be classified in accordance with SANS 10234 within one hundred and eighty (180) days of generation.
- Waste must be kept separate for the purpose of classification and must not be mixed prior to classification.
- Waste must be reclassified once every five (5) years or within thirty (30) days of modification to the processing operations of Revive Africa or input materials that generates the waste stream.
- Waste which has been treated must be re-classified accordingly.
- Revive Africa must develop a safety data sheet for all hazardous waste generated in accordance with SANS 10234.

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- No waste may be accepted which has not been classified unless such a waste is a pre-classified waste in terms of Annexure 1 of GN364.
- No waste may be diluted to reduce the concentration.
- Revive Africa must ensure that all waste removed from site for disposal to landfill is done in accordance with the Norms and Standards for disposal of Waste to Landfill in terms of Section 7(1) of the Waste Act.

14. TRAINING AND AWARENESS

- Relevant employees must be informed of the different types of waste and the correct methods with regards to the management and disposal thereof.
- Training and awareness must be provided continuously to all employees working with waste and to all contract workers that might be exposed to waste.
- Revive Africa must implement a training programme that must include:
 - a) Precautionary measures that need to be taken.
 - b) Procedures that the employees must apply their particular type of work.
 - c) Procedures for dealing with spillages and accidents.
 - d) Appropriate use of protective clothing; and
 - e) The risks of hazardous substances to their health which they are likely to be exposed to.
- A sufficient number of employees must receive training to cover for leave periods, absences due to illness, public holidays or any other reason.
- An attendance register must be kept and signed by each employee at each training session and made available to the relevant authorities when requested; and
- Only trained persons must be allowed to handle waste and or chemicals.

15. MEASURING AND MONITORING WASTE STREAMS

Waste streams are monitored and reported monthly, by the Waste Management Control Officer / Department Supervisor to management. Where major deviations or increases are noted, it must be substantiated with a reason and filed accordingly for future reference and record keeping.

Responsible persons have been appointed. Waste stream information is managed by the responsible persons for the applicable waste streams.

All waste-related records must be kept, as per the legal requirements.

16. RECORD KEEPING

Accurate and up to date records of the management of waste generated must be kept. These records must reflect:

- The classification of the waste.
- The quantity of each waste stream generated, expressed in tons or cubic meters per month.
- The quantities of each waste which has been traded, re-used, recycled, recovered, treated or disposed of; and
- By whom the waste was managed.

Records of waste management must be kept for a period of at least five (5) years and be made available to authorities or auditors upon request.

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Waste Disposal Manifests, Environmental Inspection Reports, and Internal and External Environmental Audits – Shall be retained by Revive Africa for a period of five (5) years.

17. WASTE MANIFEST DOCUMENTS

A waste manifest document must be completed for all hazardous waste loads which are accepted.

Copies of completed waste manifest documents must be kept on file for record purposes.

18. WASTE DISPOSAL REQUIREMENTS

All waste streams generated as part of daily operations must be stored and handled in line with the requirements asset out in terms of this procedure.

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ANNEXURE 1: REVIVE AFRICA WASTE INVENTORY

WASTE NAME	DETAILS	SOURCE	ON-SITE MANAGEMENT	APPROXIMATE AMOUNT	ASSESSMENT FOR DISPOSAL	SANS 10234 CLASSIFICATION	DESTINATION	WASTE HANDLER/ TRANSPORTER	RESPONSIBLE PERSON ON SITE
Printed Circuit Boards (PCBs)	End-of-life printed circuit boards containing recoverable metals	Incoming e-waste	Stored on impermeable surface in designated covered storage area prior to processing	Variable (based on throughput)	Recycle and recover metals	Hazardous	On-site processing	Internal handling / Licensed transporter	Operations Manager
Lithium-ion Batteries (LIBs)	Intact end-of-life batteries	Incoming e-waste	Stored in designated battery storage area, segregated by chemistry and condition	Variable	Recycle	Hazardous	On-site processing	Internal handling / Licensed transporter	Operations Manager
Damaged/Defective LIBs	Swollen, leaking or damaged batteries	Incoming e-waste / Operational rejects	Stored in dedicated quarantine area in suitable fire-resistant containers	Low	Recycle where feasible; otherwise dispose at licensed hazardous waste facility	Hazardous	On-site processing	Internal handling	Environmental Manager
Battery Black Mass	Mixed cathode/ano de material recovered during LIB processing	LIB recycling process	Stored in sealed, labelled containers in hazardous waste storage area	Moderate	Sent for further refining/recovery	Hazardous (subject to classification)	Approved metal refiner or recycler	Licensed transporter	Operations Manager
Copper Fraction	Recovered copper	PCB and LIB recycling	Stored in designated recyclable material area	High	Recycling	Non-hazardous recyclable	Authorised metal recycler	Licensed recycler	Production Supervisor
Aluminium Fraction	Recovered aluminium	PCB and LIB recycling	Stored in labelled containers or bins	Moderate	Recycling	Non-hazardous recyclable	Authorised metal recycler	Licensed recycler	Production Supervisor

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WASTE NAME	DETAILS	SOURCE	ON-SITE MANAGEMENT	APPROXIMATE AMOUNT	ASSESSMENT FOR DISPOSAL	SANS 10234 CLASSIFICATION	DESTINATION	WASTE HANDLER/ TRANSPORTER	RESPONSIBLE PERSON ON SITE
Ferrous Metals	Steel casings and components	PCB and LIB recycling	Stored separately for recycling	Moderate	Recycling	Non-hazardous recyclable	Scrap metal recycler	Licensed recycler	Production Supervisor
Plastic Fractions	Plastic housings and insulation	PCB dismantling	Stored separately in covered skips	Moderate	Recycle where possible; dispose of contaminated plastics	Generally non-hazardous (unless contaminated)	Plastic recycler / Licensed landfill	Licensed transporter	Operations Manager
Dust and Filter Residues	Dust collected from extraction and filtration systems	Shredding and mechanical separation	Stored in sealed drums pending classification	Low	Hazardous disposal or recovery depending on classification	Potentially hazardous	Licensed hazardous waste facility	Licensed hazardous waste transporter	Environmental Manager
Electrolyte Residues	Electrolyte recovered from damaged batteries	LIB recycling	Stored in compatible sealed containers with secondary containment	Low	Hazardous treatment/disposal	Hazardous	Licensed hazardous waste treatment facility	Licensed hazardous waste transporter	Operations Manager
Contaminated Absorbents	Spill clean-up materials	Spill response activities	Stored in sealed hazardous waste containers	Low	Hazardous disposal	Hazardous	Licensed hazardous waste landfill/treatment facility	Licensed hazardous waste transporter	Operations Manager
Contaminated PPE	Gloves, coveralls, wipes contaminated with hazardous materials	Maintenance and spill response	Collected in labelled hazardous waste bins	Low	Hazardous disposal	Hazardous	Licensed hazardous waste facility	Licensed hazardous waste transporter	Waste Management Control Officer
Used Filters	Dust extraction and ventilation systems	Air pollution control equipment	Stored in sealed containers	Low	Disposal following classification	Potentially hazardous	Licensed disposal facility	Licensed transporter	Maintenance Manager
Waste Electrical Components	Non-recoverable electronic components	PCB dismantling	Segregated and stored in designated waste bins	Low to Moderate	Disposal or specialist recycling	Subject to classification	Licensed waste facility / authorised disposal site	Licensed transporter	Operations Manager

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WASTE NAME	DETAILS	SOURCE	ON-SITE MANAGEMENT	APPROXIMATE AMOUNT	ASSESSMENT FOR DISPOSAL	SANS 10234 CLASSIFICATION	DESTINATION	WASTE HANDLER/ TRANSPORTER	RESPONSIBLE PERSON ON SITE
General Domestic Waste	Office and ablution waste	Offices and staff facilities	Collected in general waste bins	Low	Municipal disposal	General waste	Municipal landfill or authorised waste facility	Municipal or contracted service provider	Operations Manager
Recyclable Paper and Cardboard	Packaging and office waste	Offices and receiving area	Stored separately for recycling	Low	Recycling	General recyclable	Paper recycler	Recycling contractor	Operations Manager
Wooden Pallets	Packaging materials	Incoming deliveries	Reused where possible or sent for recycling	Low	Reuse or recycle	General waste	Pallet recycler	Contractor	Operations Manager

Note 1 – Contractors or service providers may change from time to time as determined by commercial and / or service delivery performance. The licence requirements and status of the new service provider or contractor will be verified, and records will be kept accordingly.

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ANNEXURE 2: EAP DECLARATIONS OF INDEPENDENCE

I, Karien Zantow, in my capacity as Environmental Consultant compiled this Waste Management Plan on behalf of CF Africa Trading (Pty) Ltd t/a Revive Africa and declare that –

- I act as independent consultant.
- I declare that there are no circumstances that may compromise my objectivity in performing my work.
- I do not and will not have any vested interest in the activity.
- I have not, and will not engage in, conflicting interests in the undertaking of the activity.
- I do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the National Environmental Management Waste Act.
- I have expertise in compiling and revising a Waste Management Plan, including knowledge of the applicable legislation and municipal by-laws and guidelines that have relevance to the activity; and
- I will comply with the Act, regulations, and all other applicable legislation.



Karien Zantow
Environmental Specialist
SACNASP Nr 400411/14
EAPASA Reg Nr 2019/1871

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REVISION HISTORY AND APPROVAL:

Ref	4382-ZANREV-2026 Waste Management Plan		
Rev	Date	Reason for Revision	Next Review date
		•	
		•	
		•	
		•	
		•	

Annexure O1

Fire Risk Assessment



FIRE RISK ASSESSMENT

E-Waste Recycling, Recovery and Treatment Facility

CF Africa Trading (Pty) Ltd t/a Revive Africa
24–26 Laub Street (extending into 28–32 Laub Street), New Centre, Johannesburg, 2001
July 2026

1. Introduction, purpose and scope

CF Africa Trading (Pty) Ltd, trading as Revive Africa (“the client”), operates an e-waste receiving, sorting, dismantling and storage facility at 24–26 Laub Street, New Centre, Johannesburg, and has applied for a Waste Management Licence for a full-scale e-waste recycling, recovery and treatment operation extending into 28–32 Laub Street. The proposed operation includes a printed circuit board (PCB) recycling plant of approximately 1 800 m² with a capacity of 40–50 tons per month, and a lithium-ion battery (LIB) recycling plant of approximately 900 m² with a capacity of up to 4 tons of batteries per day.

Section 10.5.5 of the Final Scoping Report records the client’s commitment that a fire-risk assessment be undertaken by a suitably competent specialist, with particular emphasis on lithium-ion battery storage and processing, and that its findings inform the final facility layout, the operating procedures and the Emergency Preparedness and Response Plan (“EPRP”). This assessment discharges that commitment. Each of the items enumerated in section 10.5.5 is addressed in this report.

The purpose of this Fire Risk Assessment is to identify the fire hazards associated with the existing and proposed activities, to evaluate the adequacy of the existing fire protection provisions, to rate the resulting risks using a documented methodology, and to set out a prioritised risk-reduction action plan. Its findings feed directly into the fire scenario, evacuation procedures and response measures of the EPRP, which is issued as a separate deliverable.

1.1 Assessment basis and limitations

- Final Scoping Report 4110-ZANREV-2026 (F) dated 13 July 2026, including the operational data, process descriptions and Plan of Study;
- Existing and Proposed Facility Layout drawings forming part of the WML application;
- Site photographs forming part of the WML application, and twelve interior and yard photographs supplied by the client in July 2026;
- The client’s advice that the facility is not a Major Hazard Installation as contemplated in the Major Hazard Installation Regulations, 2022 (GN R.2989, GG 47970, 31 January 2023). This assessment accordingly excludes MHI notification, safety report and SANS 1514 alignment. Given the proposed escalation of battery processing to 4 tons per day, it is recommended that the client verify this position against the listed substances and threshold quantities of those Regulations once the design inventory for the full-scale plant is settled, and the exclusion is recorded on that basis;
- No destructive testing, fire load calculation by calorimetry, fire modelling or engineering simulation has been performed. This assessment was performed on a desktop basis; no physical site inspection was undertaken, and the assignment was executed on the client’s instruction using the information listed above and information provided by the client, on whose accuracy and completeness this assessment relies. Where a fact or the status of a control could not be confirmed from that information, this is stated in the relevant section, and the associated risk has been rated on a conservative basis. The client should confirm the unconfirmed items and advise Fourie LRC of any material inaccuracy, which may require the affected ratings to be revised.

2. Facility description

The facility occupies a street-fronted, multi-storey brick building and associated single-storey warehouse structures within a densely developed urban block, with third-party occupancies and public roadways

immediately adjacent on all boundaries and informal activity in the surrounding area. Internal areas comprise a receiving area, e-waste sorting and storage areas, a dismantling station with workstations, an LIB processing and storage area, and general waste storage, subdivided principally by steel mesh security cages. Roof construction over the warehouse areas comprises steel trusses with corrugated sheeting incorporating translucent panels; the multi-storey block is of masonry and concrete construction with an external steel escape stair.

Historical processing has remained below 500 kg per day (a maximum of approximately 379 kg per day combined in 2026, of which approximately 37 kg per day comprised lithium-ion battery treatment). Materials are handled in bulk bags on timber pallets, timber crates and cartons, moved by a diesel forklift and pallet trucks. The proposed operation materially increases both throughput and hazard, most significantly through the 4 ton per day battery plant incorporating discharging, shredding and screening, with black mass recovery. Occupancy comprises operational personnel at dismantling workstations and stores, administrative staff, and visiting drivers. Headcount, shift arrangements and after-hours occupation were not confirmed from the information available and should be confirmed by the client.

3. Methodology

Fire risks are rated as the product of likelihood (L, 1–5) and consequence (C, 1–5), on the matrix below, and banded as Low (1–4), Medium (5–9), High (10–15) and Extreme (16–25). Ratings are desktop ratings reflecting the risk with existing controls as understood from the assessment basis. Consequence is assessed with reference to harm to persons, property loss, off-site and environmental impact, and business interruption, taking the most severe credible outcome. Risks are rated twice: a current rating reflecting the existing control measures, and a residual rating reflecting the position targeted once the additional control measures in the register and the action plan have been implemented and are sustained.

Likelihood ↓ / Consequence →	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
5 Almost certain	5	10	15	20	25
4 Likely	4	8	12	16	20
3 Possible	3	6	9	12	15
2 Unlikely	2	4	6	8	10
1 Rare	1	2	3	4	5

4. Fire hazard identification

4.1 Fire load

- Dense combustible storage throughout: mixed e-waste (plastics-rich housings, cable, printed circuit boards with brominated flame retardants that generate highly toxic combustion products), toner cartridges and toner dust, cartons, timber crates and pallets, and polypropylene bulk bags – the bags themselves contributing to vertical fire spread;
- Lithium-ion batteries in storage and in process – an energetic fire load capable of self-sustained combustion independent of external oxygen contribution, with ejection of burning cells;
- Fuel: diesel for the forklift and petrol for the portable generator, with a fuel container observed within a storage area (photographic observation – refer FR-05);
- General waste storage.

4.2 Ignition sources

- Electrical installation and distribution in an older building; residual energy in received devices; charging activities (not confirmed from the information available);
- Mechanical damage to lithium-ion cells during sorting, dismantling, handling and (as proposed) shredding – the dominant initiation mechanism at this facility;
- The portable generator and refuelling activities; hot forklift components;
- Hot work during maintenance; smoking (no-smoking signage observed; enforcement not confirmed from the information available); arson at the perimeter.

4.3 Lithium-ion battery thermal runaway (Scoping Report s10.5.5 items)

Thermal runaway is addressed with reference to each item enumerated in the Scoping Report:

- Battery chemistry and state of charge: incoming chemistries (LCO, NMC, LFP, NCA, LMO) vary in thermal stability; state of charge on receipt is uncontrolled. Discharge before processing (as the proposed process provides) is the single most effective preventive control;
- Damaged, defective and recalled batteries: the highest-likelihood initiation population; requires a dedicated quarantine regime (action A1);
- Thermal runaway and propagation: bulk-bag storage on timber pallets provides no propagation barrier between cells or between bags; propagation modelling is not possible desktop-side, but the configuration must be treated as conducive to spread;
- Combustible and explosive gases: vented electrolyte vapours (including hydrogen, CO and hydrocarbon species, with HF on combustion) present a flash fire and explosion hazard in enclosed areas, decisive for the proposed 900 m² plant (FR-14, actions A8–A9);
- Quarantine arrangements: no dedicated quarantine area is identifiable on the layout drawings or in the photographs reviewed;
- Compatibility of extinguishing agents: conventional DCP and CO₂ extinguishers do not arrest thermal runaway; cooling-based or encapsulating agents are required (action A3).

5. Assessment of existing fire protection provisions

5.1 Passive protection and compartmentation

Internal subdivision is by steel mesh security cages, which provide no fire resistance and no smoke separation; the warehouse areas therefore function as effectively undivided fire compartments containing dense combustible storage. The separation between the warehouse structures, the multi-storey block, and adjoining third-party occupancies is of masonry construction, but the fire rating of openings, service penetrations and roof junctions could not be confirmed from the information available. Translucent roof sheeting will fail early in a fire, which assists smoke venting but also admits external fire brands.

5.2 Means of escape

Escape from caged storage areas is dependent on cage gates and, in places, appears to be single-direction; large roller shutter doors serve as primary egress from warehouse areas; the multi-storey block relies on internal stairs and the external steel escape stair. Escape signage, emergency lighting, panic hardware, travel distances and door ironmongery could not be assessed against SANS 10400-T from the information available (action A5). Housekeeping in escape routes was acceptable in the photographs reviewed but requires ongoing control given storage density.

5.3 Detection, alarm and suppression

No automatic fire detection or fixed suppression installation is identifiable from the material reviewed; portable extinguishers were observed at workstation areas (a single DCP unit visible in the photographs). At the current scale this is a significant gap after hours; at the proposed scale it is untenable without detection, gas detection in the battery plant, and suppression capability matched to LIB fires (FR-13, FR-14; actions A3, A9). Extinguisher servicing status under SANS 10105-1 was not confirmed from the information available.

5.4 Management provisions

No-smoking signage is displayed. The status of the following could not be confirmed from the information available and should be confirmed by the client: fire equipment service register; electrical Certificate of Compliance; hot work permit system; fire team appointments and training; evacuation drill records; housekeeping inspection regime; and the City of Johannesburg fire safety certificate / certificate of fitness for the occupancy.

5.5 Firewater containment

No dedicated firewater containment is identifiable. Suppression water from any significant fire will entrain metal-bearing residues, electrolyte decomposition products and toner, and – absent isolation – will discharge to the municipal stormwater system, constituting an emergency incident under section 30 of NEMA with attendant reporting and remediation duties (FR-11; action A10). This finding is carried into the EPRP spillage and fire scenarios.

5.6 Emergency service access

The facility fronts public roads on multiple elevations, which favours fire appliance access, but on-street congestion, gated yard access and after-hours security arrangements may delay entry; hydrant locations, flow and pressure were not confirmed from the information available. A familiarisation engagement with the City of

Johannesburg Emergency Management Services is recommended (action A13), including provision for smoke-plume notification to the aviation authorities as contemplated in the Scoping Report.

6. Fire risk register

For each risk, the register records the principal causes, the credible consequence, the existing control measures, the current risk rating (likelihood × consequence with existing controls in place), the additional control measures required (cross-referenced to the action plan in section 8), and the residual risk rating targeted on implementation of those measures. Residual ratings assume full and sustained implementation of the additional controls.

FR-01 – Lithium-ion battery thermal runaway in storage	
Principal causes	Damaged, defective, swollen or end-of-life cells stored in bulk bags; elevated state of charge; internal short circuit; external heating
Credible consequence	Self-propagating fire; ejection of flaming cells; toxic and flammable gas release (HF, CO, electrolyte vapours); propagation to adjacent stock
Existing control measures	Batteries stored within access-controlled steel mesh cages on pallets, off the floor; no-smoking rule and signage; incoming receipt inspection (not confirmed from the information available). No dedicated quarantine area or non-combustible containment for damaged units is identifiable.
Current risk (existing controls)	$L4 \times C5 = 20$ – EXTREME
Additional control measures required	Dedicated quarantine area with non-combustible containment for damaged, defective, swollen and recalled units (A1); documented incoming state-of-charge and condition inspection with direct routing of damaged units to quarantine (A4); LIB-compatible suppression at the storage area (A3); automatic detection (A9); separation distances and propagation barriers between bulk storage positions
Residual risk (on implementation)	$L2 \times C4 = 8$ – MEDIUM

FR-02 – Thermal runaway during handling, dismantling or processing	
Principal causes	Mechanical damage (puncture, crushing, dropping) during sorting, dismantling or shredding of LIBs
Credible consequence	Localised fire escalating to area fire; operator burn and inhalation injury
Existing control measures	Manual dismantling at dedicated workstations; hand tools; operator PPE (gloves) observed; battery discharging performed before treatment; operator training records (not confirmed from the information available).
Current risk (existing controls)	$L4 \times C4 = 16$ – EXTREME
Additional control measures required	Formal battery-handling procedure covering damage recognition and the thermal runaway indicators (heat, swelling, venting, odour); insulated tools; LIB-compatible extinguishing units within reach of each battery workstation (A3); training per the EPRP schedule; for the proposed plant, mechanical pre-treatment only of verified-discharged cells with interlocked enclosure (A8, A9)
Residual risk (on implementation)	$L2 \times C4 = 8$ – MEDIUM

FR-03 – Fire in general e-waste storage areas	
Principal causes	Electrical fault, discarded ignition source, residual energy in devices; high fire load of plastics, PCBs, packaging, bulk bags and timber pallets
Credible consequence	Rapid fire growth in dense combustible storage; heavy smoke production
Existing control measures	Housekeeping within storage cages observed as orderly; access control to cages; no-smoking signage displayed; portable extinguishers at workstation areas; daily close-down practice (not confirmed from the information available).
Current risk (existing controls)	L3 × C4 = 12 – HIGH
Additional control measures required	Automatic fire detection with monitored notification across the storage areas (A9); daily documented close-down inspection; segregation of high-fire-load packaging from stock; aisle discipline maintained by the forklift operating corridor (A11)
Residual risk (on implementation)	L2 × C3 = 6 – MEDIUM

FR-04 – Fire spread between storage and processing areas	
Principal causes	Internal subdivision by steel mesh cages which provide security but no fire resistance; combustible storage abutting multiple areas
Credible consequence	Loss of the full warehouse; spread toward the multi-storey block and adjoining occupancies
Existing control measures	Masonry construction between the principal structures and adjoining occupancies; mesh cage subdivision (security function only – no fire resistance or smoke separation); fire rating of openings and penetrations (not confirmed from the information available).
Current risk (existing controls)	L3 × C5 = 15 – HIGH
Additional control measures required	Fire-rated separation, or defensible spatial separation with clear zones, between principal storage areas and between storage and processing, with the input of a registered fire engineering practitioner for the proposed full-scale layout (A8); detection to shorten intervention time (A9)
Residual risk (on implementation)	L2 × C4 = 8 – MEDIUM

FR-05 – Ignition at the portable generator and fuel container	
Principal causes	Petrol-driven generator and plastic fuel container located within a storage area adjacent to combustible bulk bags and packaging (desktop observation from client photographs)
Credible consequence	Fuel-fed fire in a congested storage area; rapid escalation
Existing control measures	Generator used intermittently as backup supply; extinguisher available in the general area; refuelling practice (not confirmed from the information available).
Current risk (existing controls)	L3 × C4 = 12 – HIGH

Additional control measures required	Remove the generator and all fuel containers from combustible storage areas to a dedicated external position with appropriate separation and a suitable extinguisher (A2); fuel log and weekly start test at the external position per the EPRP
Residual risk (on implementation)	$L1 \times C3 = 3$ – LOW

FR-06 – Forklift operations	
Principal causes	Refuelling of the diesel forklift indoors; mechanical damage to stored batteries by forklift tines; hot surfaces adjacent to combustibles
Credible consequence	Ignition of stored combustibles; initiation of battery thermal runaway
Existing control measures	Forklift fitted with an extinguisher (observed); operator licensing and pre-use inspection regime (not confirmed from the information available); no-smoking rule.
Current risk (existing controls)	$L3 \times C4 = 12$ – HIGH
Additional control measures required	Refuelling outdoors at a designated position only; demarcated forklift operating corridors protecting stored batteries from impact (A11); planned maintenance and daily pre-use checks; battery stock protected by rack-end barriers where practicable
Residual risk (on implementation)	$L2 \times C3 = 6$ – MEDIUM

FR-07 – Electrical installation and distribution	
Principal causes	Ageing installation in a building of pre-modern construction; overloading; unauthorised extensions; absence of current Certificate of Compliance (not confirmed from the information available)
Credible consequence	Electrical fire, potentially after hours and undetected
Existing control measures	Fixed installation with enclosed distribution boards; extent of alterations, load balance and CoC status (not confirmed from the information available).
Current risk (existing controls)	$L3 \times C4 = 12$ – HIGH
Additional control measures required	Obtain or produce a valid electrical Certificate of Compliance including alterations; thermographic survey of distribution boards; prohibition on unauthorised extensions (A6); after-hours risk mitigated by automatic detection (A9)
Residual risk (on implementation)	$L2 \times C4 = 8$ – MEDIUM

FR-08 – Hot work and maintenance activities	
Principal causes	Cutting, welding or grinding during maintenance or rack construction without a hot work permit system (not confirmed from the information available)
Credible consequence	Ignition of adjacent combustibles; smouldering fire developing after work completion
Existing control measures	Maintenance performed by contractors under supervision; formal hot work permit system (not confirmed from the information available).

Current risk (existing controls)	$L2 \times C4 = 8$ – MEDIUM
Additional control measures required	Hot work permit system with designated hot work area, fire watch during and for 60 minutes after the work, and removal or protection of combustibles within the work radius (A7)
Residual risk (on implementation)	$L1 \times C4 = 4$ – LOW

FR-09 – Arson and security-related ignition	
Principal causes	Inner-city location; informal activity adjacent to the site; unauthorised access after hours
Credible consequence	Deliberate ignition at the perimeter or within yard storage
Existing control measures	Perimeter walls, palisade fencing and controlled gates; barbed wire observed on street elevations; CCTV coverage and after-hours guarding arrangements (not confirmed from the information available).
Current risk (existing controls)	$L2 \times C4 = 8$ – MEDIUM
Additional control measures required	Review of perimeter security, surveillance coverage and after-hours response; yard housekeeping to remove combustible accumulation at the perimeter (A12); external lighting maintained through power failures per the EPRP
Residual risk (on implementation)	$L1 \times C4 = 4$ – LOW

FR-10 – Smoke impact on off-site receptors and aviation	
Principal causes	Any significant fire at the facility, particularly involving LIBs and plastics
Credible consequence	Toxic smoke affecting adjacent occupancies and public roads; smoke plume affecting aviation operations, requiring notification of the aviation authorities
Existing control measures	No specific existing controls beyond the general suppression and response capability assessed in section 5; liaison with the emergency services not yet formalised.
Current risk (existing controls)	$L3 \times C4 = 12$ – HIGH
Additional control measures required	Early detection and suppression to limit fire size (A3, A9); EMS familiarisation and pre-planning, including hydrant confirmation and access (A13); neighbour and aviation notification protocols implemented through the EPRP
Residual risk (on implementation)	$L2 \times C3 = 6$ – MEDIUM

FR-11 – Contaminated firewater run-off	
Principal causes	Fire suppression water contacting e-waste, battery residues and metal-bearing dusts; absence of dedicated firewater containment (not confirmed from the information available)
Credible consequence	Contaminated run-off entering the municipal stormwater system; an emergency incident in terms of section 30 of NEMA
Existing control measures	Impermeable concrete floors and surfaced yard; no bunding, isolation valves or dedicated containment for firewater is identifiable.
Current risk (existing controls)	$L3 \times C4 = 12$ – HIGH

Additional control measures required	Firewater containment strategy: drain covers or isolation on the stormwater connections, bunding or sacrificial containment capacity, deployed per the EPRP fire scenario (A10); spill and containment equipment positioned per the EPRP equipment register
Residual risk (on implementation)	$L2 \times C3 = 6$ – MEDIUM

FR-12 – Obstruction or inadequacy of means of escape	
Principal causes	Dense storage; single-direction escape from caged areas; roller shutter doors as primary exits; occupation of the multi-storey block (not confirmed from the information available)
Credible consequence	Delayed evacuation; entrapment of persons in smoke-logged areas
Existing control measures	Multiple roller shutter and personnel door exits from the warehouse areas; external steel escape stair serving the multi-storey block; escape routes observed clear in the photographs reviewed; signage, emergency lighting, panic hardware and travel distances (not confirmed from the information available).
Current risk (existing controls)	$L3 \times C5 = 15$ – HIGH
Additional control measures required	Means-of-escape assessment against SANS 10400-T with corrective measures: escape signage, emergency lighting, panic hardware, secondary escape from caged areas, cage gates openable from inside without a key while occupied (A5); route housekeeping discipline; six-monthly evacuation drills per the EPRP
Residual risk (on implementation)	$L2 \times C4 = 8$ – MEDIUM

FR-13 – Suppression capability not matched to the lithium-ion battery hazard	
Principal causes	Portable extinguishers of conventional type; no fixed suppression observed in the warehouse areas; extinguishing media not verified as compatible with LIB fires (not confirmed from the information available)
Credible consequence	Inability to suppress or contain a battery fire in its incipient stage at the proposed processing scale of up to 4 tons per day
Existing control measures	Portable DCP/CO ₂ extinguishers at workstation areas; servicing status under SANS 10105-1 (not confirmed from the information available).
Current risk (existing controls)	$L4 \times C4 = 16$ – EXTREME
Additional control measures required	LIB-compatible extinguishing media (water mist, encapsulator agent or equivalent, and Class D where metallic lithium exposure is foreseeable) at battery storage, dismantling and processing areas, with supplier confirmation of compatibility for the chemistries handled (A3); fire team trained on the media and on the strict limits of first response (EPRP); fixed suppression evaluated for the proposed plant under A8
Residual risk (on implementation)	$L2 \times C3 = 6$ – MEDIUM

FR-14 – Combustible and explosive gas accumulation (proposed LIB plant)	
Principal causes	Electrolyte vapour and off-gassing from damaged or off-specification cells within the proposed 900 m ² battery plant; inadequate ventilation or gas detection

Credible consequence	Flash fire or explosion within an enclosed processing area
Existing control measures	Proposed activity – not yet commissioned. No existing controls; the Scoping Report commits to environmental and safety controls for VOCs, fluorinated gases and particulates in the plant design.
Current risk (existing controls)	$L3 \times C5 = 15$ – HIGH
Additional control measures required	Design-stage controls as commissioning preconditions: mechanical ventilation sized for the vapour load, combustible-gas detection interlocked to ventilation and process shutdown (A9), fire-rated separation of the plant informed by a registered fire engineering practitioner (A8), and discharge verification before mechanical treatment
Residual risk (on implementation)	$L2 \times C4 = 8$ – MEDIUM

7. Compliance gap analysis

Requirement and source	What it requires	Status
Fire precautions and means of egress – Environmental Regulations for Workplaces, 1987 (OHSA)	Escape routes, doors and egress capacity; fire precautions commensurate with the risk	Not confirmed from the information available – to be confirmed by the client
SANS 10400-T (NBR Act 103 of 1977)	Occupancy classification, compartmentation, escape distance, exit provision, fire resistance of elements	Not confirmed from the information available – mesh cage subdivision provides no fire resistance
SANS 10105-1	Selection, placement and servicing of portable fire extinguishers	Not confirmed from the information available – media suitability for LIB fires to be confirmed by the client
City of Johannesburg Emergency Services By-laws	Fire safety certificate / certificate of fitness; hazardous substance storage provisions; fire service access	Not confirmed from the information available – to be confirmed by the client
Certificate of Compliance – Electrical Installation Regulations (OHSA)	Valid CoC for the electrical installation, including alterations	Not confirmed from the information available – to be confirmed by the client
Norms and Standards for the Storage of Waste, GN 926, GG 37088 (NEM:WA)	Registration, containment, separation and management provisions for the hazardous waste storage areas (registration in progress per the Scoping Report)	Partially addressed – registration in progress
NEMA section 30	Capability to contain, report and remediate an emergency incident, including contaminated firewater	Addressed through the EPRP and action A10
Hazardous Chemical Agents Regulations, 2021 (OHSA)	Exposure control for electrolyte vapours, metal dusts and combustion products in processing areas	To be addressed in the proposed plant design; interim controls (not confirmed from the information available)

8. Risk-reduction action plan

Priority 1: implement within 0–3 months (or before commissioning of the relevant proposed activity, whichever is earlier). Priority 2: 3–6 months. Priority 3: 6–12 months. Responsible persons and target dates to be allocated by the client on adoption of this plan; the final column records the client's allocated owner.

Ref	Action	Risk ref	Prio	Owner
A1	Establish a dedicated, segregated quarantine area for damaged, defective, swollen and recalled lithium-ion batteries, physically separated from general battery stock, with non-combustible containment (e.g. sand-filled or rated battery containers) and clear labelling	FR-01, FR-02	1	[]
A2	Remove the portable generator and all fuel containers from combustible storage areas; establish a dedicated external fuel and generator position with appropriate separation and a suitable extinguisher	FR-05	1	[]
A3	Procure and position extinguishing media verified as suitable for lithium-ion battery fires (e.g. water mist, F-500 encapsulator agent or equivalent, and Class D where metallic lithium exposure is foreseeable) at the battery storage, dismantling and proposed processing areas; obtain confirmation of agent compatibility from the supplier for the battery chemistries handled	FR-13, FR-01, FR-02	1	[]
A4	Verify, and where absent implement, a documented daily state-of-charge and condition inspection for incoming batteries, with damaged units routed directly to quarantine	FR-01, FR-02	1	[]
A5	Commission an assessment of the means of escape across the warehouse and multi-storey block against SANS 10400-T, and implement corrective measures (escape signage, emergency lighting, panic hardware, secondary escape from caged areas)	FR-12	1	[]
A6	Obtain or produce a valid Electrical Certificate of Compliance for the installation; implement a thermographic survey of distribution boards; prohibit unauthorised electrical extensions	FR-07	2	[]
A7	Implement a hot work permit system and designated hot work area	FR-08	2	[]
A8	Introduce fire-rated separation, or defensible spatial separation with sprinkler-protected or clear zones, between the principal storage areas and between storage and processing; obtain the input of a fire engineering practitioner registered under the Engineering Profession Act 46 of 2000 for the proposed full-scale plant layout	FR-04, FR-14	2	[]
A9	Install automatic fire detection with monitored notification appropriate to the occupancy, prioritising the battery storage and processing areas; for the proposed LIB plant, provide combustible-gas detection interlocked to ventilation and process shutdown	FR-03, FR-14	2	[]
A10	Develop and implement a firewater containment strategy (bundling, drainage isolation valves or sacrificial containment) to prevent contaminated run-off reaching the municipal stormwater system	FR-11	2	[]

Ref	Action	Risk ref	Prio	Owner
A11	Formalise forklift refuelling outdoors at a designated position; implement a forklift operating corridor discipline to protect stored batteries from impact	FR-06	2	[]
A12	Review perimeter security, after-hours surveillance and yard housekeeping to manage the arson exposure	FR-09	3	[]
A13	Establish liaison with the City of Johannesburg Emergency Management Services, including a familiarisation visit, confirmation of access and water supply, and provision of the site layout and hazard information; include the aviation notification protocol in the EPRP	FR-10, FR-12	2	[]
A14	Maintain the fire equipment service programme in terms of SANS 10105-1 and retain records for inspection	FR-03, FR-13	3	[]

9. Conclusions

At its existing scale the facility presents a High fire risk profile, driven by dense combustible storage, lithium-ion batteries in bulk-bag storage without quarantine segregation, the absence of automatic detection and of suppression media matched to battery fires, non-fire-rated internal subdivision, and unverified means of escape – all within an urban block where a significant fire will have immediate off-site consequences, including toxic smoke exposure of neighbouring occupancies and potential aviation impact, and contaminated firewater discharge constituting a NEMA section 30 incident.

The proposed escalation to 4 tons of lithium-ion batteries per day is not acceptable on the existing control framework. Commissioning of the battery plant should be conditional on: the quarantine regime (A1); LIB-compatible suppression (A3); automatic fire and combustible-gas detection interlocked to ventilation and shutdown (A9); fire-rated separation of the plant informed by a registered fire engineering practitioner (A8); and firewater containment (A10). Subject to implementation of the Priority 1 actions, the residual risk at the existing scale is capable of reduction to Medium; the residual risk of the proposed plant must be re-assessed once the engineering design is available.

The findings of this assessment are carried directly into the site fire scenario, the evacuation procedures and the notification protocols of the Emergency Preparedness and Response Plan issued as a companion deliverable.

10. References

- Occupational Health and Safety Act 85 of 1993; Environmental Regulations for Workplaces, 1987; General Safety Regulations, 1986; Electrical Installation Regulations, 2009; Hazardous Chemical Agents Regulations, 2021
- National Building Regulations and Building Standards Act 103 of 1977; SANS 10400-T; SANS 10400-W
- SANS 10105-1; SANS 10287
- National Environmental Management Act 107 of 1998, s30; National Environmental Management: Waste Act 59 of 2008; Norms and Standards for the Storage of Waste, GN 926, GG 37088 of 29 November 2013
- Major Hazard Installation Regulations, 2022 (GN R.2989, GG 47970) – exclusion recorded in s1.1

- City of Johannesburg Emergency Services By-laws; Disaster Management Act 57 of 2002
- Final Scoping Report 4110-ZANREV-2026 (F), Zantow Environmental Consulting Services CC, 13 July 2026

Louis Fourie

Director | Fourie Legal and Risk Consulting (Pty) Ltd

LLB | LLM (Environmental Law)

Annexure O2

Emergency Preparedness and Response Plan



EMERGENCY PREPAREDNESS AND RESPONSE PLAN

E-Waste Recycling, Recovery and Treatment Facility

CF Africa Trading (Pty) Ltd t/a Revive Africa
24–26 Laub Street (extending into 28–32 Laub Street), New Centre, Johannesburg, 2001
July 2026

1. Purpose, scope and legal framework

This Emergency Preparedness and Response Plan ("the Plan") establishes the organisation, procedures and resources by which CF Africa Trading (Pty) Ltd t/a Revive Africa ("the facility") will prepare for, respond to and recover from emergencies arising from its e-waste receiving, sorting, dismantling, storage, recycling, recovery and treatment activities, including the proposed printed circuit board recycling plant and lithium-ion battery recycling plant. It applies to all employees, contractors, visitors and drivers, on site and – in respect of transport emergencies – in transit.

The Plan gives effect principally to section 30 of the National Environmental Management Act 107 of 1998 (control of emergency incidents), and further to: the National Environmental Management: Waste Act 59 of 2008 and the conditions of the Waste Management Licence once issued; the Occupational Health and Safety Act 85 of 1993 with the Environmental Regulations for Workplaces, 1987 and General Safety Regulations, 1986; the Disaster Management Act 57 of 2002; the National Road Traffic Act 93 of 1996 read with SANS 10231 in respect of the transport of lithium-ion batteries (UN 3480 / UN 3481); the Norms and Standards for the Storage of Waste (GN 926, GG 37088); and the City of Johannesburg Emergency Services By-laws.

The Plan is informed by, and must be read with, the Fire Risk Assessment issued as a companion deliverable, whose findings determine the site fire scenario, the evacuation provisions and elements of the notification protocol. The Plan is drafted for incorporation into, and consistency with, the Environmental Management Programme for the facility once available, and satisfies the commitment in the Final Scoping Report (4110-ZANREV-2026 (F)) to develop an Emergency Preparedness and Response Plan for the full-scale operation. The facility is not a Major Hazard Installation on the client's advice; should that position change, this Plan must be aligned to SANS 1514 under the Major Hazard Installation Regulations, 2022.

2. Emergency organisation and responsibilities

2.1 Emergency Co-ordinator

- Assumes overall control of any emergency until relieved by the emergency services; declares the emergency level and orders evacuation;
- Ensures the notifications in section 3 are made, including the section 30 NEMA notification;
- Authorises re-entry and stand-down; ensures the incident record and investigation are initiated;
- Appointee: [Name]. Deputy (and after-hours contact): [Name].

2.2 Fire team / emergency response team

- Executes first-response actions (incipient-stage suppression, isolation, spill containment) only where trained, equipped and safe to do so;
- Sweeps areas during evacuation; controls access at the gate for emergency services; team members and areas of responsibility: [List].

2.3 First aiders

- Render first aid; identify casualties requiring ambulance evacuation; record treatments. Appointees: [Names].

2.4 All personnel

- Report any emergency or abnormal condition immediately; know the alarm signal, escape routes and assembly point; comply with instructions; do not re-enter until stand-down.

2.5 Drivers and dispatch personnel

- Carry the transport emergency information in section 7.2, the contact card and the vehicle spill kit; report in-transit incidents immediately to the Emergency Co-ordinator.

3. Alarm, communication and notification

3.1 Raising the alarm

Any person discovering an emergency must raise the alarm by [alarm method – siren / air horn / shout relay – to be confirmed] and report to the Emergency Co-ordinator, stating location, nature and persons affected. Alarm signal for evacuation: [describe]. All-clear signal: [describe].

3.2 External notification

The Emergency Co-ordinator makes external notifications in the following order of priority: (1) emergency services where life, property or the environment is threatened; (2) the section 30 NEMA notification where the incident meets the definition in section 3.3; (3) the authorities and parties in the directory below as applicable to the scenario; (4) neighbouring occupancies where off-site effects (smoke, run-off, evacuation) are foreseeable, and the aviation notification in the case of a significant smoke plume.

3.3 Section 30 NEMA – emergency incident reporting

An “incident” for these purposes is an unexpected, sudden and uncontrolled release of a hazardous substance, including from a fire, that may cause serious harm to the environment, human life or property. Where such an incident occurs, the responsible person must:

1. Immediately, and within the practical demands of containment, notify: the Gauteng competent authority; the SAPS and the relevant fire prevention service; the relevant municipality; and all persons whose health may be affected – report initial observations promptly, and in any event within 14 days provide the written report required by section 30(6);
2. Take all reasonable measures to contain and minimise the effects of the incident, including its immediate consequences and any risks posed to public health;
3. Undertake clean-up procedures and remedy the effects of the incident;
4. Assess the immediate and long-term effects on the environment and public health;
5. Comply with any verbal or written directive issued by the authorities, and retain all records, samples and photographs for the investigation.

The written section 30(6) report must set out the nature of the incident, the substances involved and their quantity, initial measures taken, the causes, and the measures taken and to be taken to avoid recurrence.

3.4 Emergency contact directory

Role / organisation	Name	Contact
Emergency Co-ordinator	[Name]	[Mobile]
Deputy Emergency Co-ordinator	[Name]	[Mobile]
Site fire team leader	[Name]	[Mobile]
First aider(s)	[Name(s)]	[Mobile]
Facility manager – Revive Africa	Fergus Slattery	081 747 2326 / 011 493 5700
City of Johannesburg Emergency Management Services (fire / rescue / ambulance)	–	011 375 5911 / 10177
SAPS – [local station]	–	10111 / [station number]
Gauteng Dept: Agriculture, Rural Development and Environment (competent authority – s30 NEMA)	[Duty contact]	[Number]
City of Johannesburg – Environmental Health / Waste	Mr Thami Zwane	ThamiRZ@joburg.org.za / [Number]
Johannesburg Water (effluent / stormwater incidents)	–	011 688 1400 / [after-hours]
Air Traffic and Navigation Services / nearest ATC unit (smoke plume notification)	–	[Number]
Department of Employment and Labour (OHSA s24 incidents)	–	[Provincial office number]
Spill response contractor	[Company]	[24-hr number]
Electrical contractor (24-hr)	[Company]	[Number]
Insurer – claims / incident line	[Insurer]	[Number]
Environmental consultant (EAP) – Zantow Environmental Consulting	Karien Zantow	083 384 3641
HSE legal advisor – Fourie LRC	Louis Fourie	073 235 7536

The directory must be displayed at the receiving area, the dismantling stations, the battery area and the office, and reviewed quarterly.

4. Emergency scenarios and response procedures

Each scenario below sets out prevention and preparedness measures, the response procedure, and recovery actions. Where a scenario constitutes or develops into a section 30 incident, the notification procedure in section 3.3 applies in addition to the scenario steps.

4.1 Power failure

Prevention and preparedness

- Backup generator maintained at its designated external position with a weekly start test and fuel log; fuel stored away from combustible storage (FRA action A2);
- Uninterruptible supply or controlled-shutdown provision for fire detection, gas detection (proposed plant), access control and emergency lighting;
- Documented safe shutdown and restart sequences for dismantling, discharging, shredding and screening equipment, displayed at each machine.

Response

1. Stop all processing equipment via normal or emergency stop; render equipment safe (lock-out) before any restoration attempt;
2. The Emergency Co-ordinator confirms whether the failure is internal (distribution fault – isolate and call the electrical contractor) or external (load-shedding / grid failure);
3. Suspend all battery discharging, dismantling and (once operational) shredding activities – these must not run without extraction, ventilation and detection in service;
4. Deploy the generator to priority loads (emergency lighting, detection, security, communications) only; do not run processing from backup power;
5. Post personnel at darkened or access-controlled points; secure the perimeter, as power failure elevates the security and arson exposure;
6. If the failure is prolonged, suspend receiving, secure open storage, and stand personnel down in an orderly manner.

Recovery

- Confirm electrical integrity (and CoC where repairs were made) before re-energising; restart equipment per the documented sequence; verify detection and extraction are in service before battery activities resume; record the event in the incident register.

4.2 Equipment malfunction

Prevention and preparedness

- Planned maintenance and pre-use inspections for the forklift, pallet trucks, dismantling tools and (once commissioned) discharging, shredding and screening plant;
- Emergency stops identified and tested; lock-out / tag-out equipment and procedure implemented; guards in place;
- Operators trained on the malfunction indicators specific to battery processing: abnormal noise or vibration, jamming, heating, smoke or electrolyte odour.

Response

1. Stop the equipment by emergency stop; isolate and lock out the energy source;

2. If a person is entrapped or injured, summon the first aider and, where required, the ambulance service; do not attempt release that could worsen injury – await emergency services unless immediate danger dictates otherwise;
3. If the malfunction involves battery-processing equipment, treat any heating, smoke or odour as incipient thermal runaway and apply the fire scenario (4.3) without delay: clear the area and prepare suppression;
4. Quarantine any batteries or material damaged by the malfunction;
5. Report to the Emergency Co-ordinator; tag the equipment out of service.

Recovery

- Repair by competent persons only; complete an incident report and, where the malfunction caused injury or a dangerous occurrence, assess reportability to the Department of Employment and Labour under OHS Act section 24; review the maintenance regime.

4.3 Site fire (including lithium-ion battery thermal runaway)

This scenario is governed by the findings of the Fire Risk Assessment, which identifies battery thermal runaway, dense combustible storage, non-rated internal subdivision and off-site smoke exposure as the determining features of a fire at this facility.

Prevention and preparedness

- Implementation of the FRA risk-reduction action plan, in particular: battery quarantine (A1); removal of the generator and fuel from storage areas (A2); LIB-compatible suppression media (A3); incoming battery inspection (A4); means-of-escape corrective measures (A5); detection (A9); firewater containment (A10);
- Housekeeping discipline in storage areas and escape routes; enforcement of no smoking and the hot work permit system; daily close-down inspection;
- Fire team trained on the thermal runaway indicators – hissing or venting, sweet chemical odour, swelling, heat, sparking – and on the strict limits of first-response suppression.

Response

1. Raise the alarm; the Emergency Co-ordinator orders evacuation per section 5 – for any fire involving or near lithium-ion batteries, evacuation is ordered immediately and is not conditional on suppression success;
2. Call the City of Johannesburg EMS (011 375 5911 / 10177), stating that the facility stores and processes lithium-ion batteries and e-waste, the location of the fire, and access arrangements;
3. Attempt first-response suppression only if the fire is incipient, the responder is trained, a safe escape path exists, and – for battery involvement – only with the LIB-compatible media provided; conventional DCP/CO₂ must not be relied upon to arrest thermal runaway. One attempt; if not immediately effective, withdraw and close doors/gates behind;
4. Isolate electrical supply to the affected area where safely accessible; shut down extraction only if it is spreading smoke to occupied areas [To be confirmed by the client] against the ventilation design;
5. Deploy stormwater isolation measures (drain covers / isolation valves) to contain firewater run-off – contaminated run-off entering the municipal system is a section 30 incident and triggers the notifications in 3.3, including Johannesburg Water;
6. On EMS arrival, hand over control; provide the site layout, hydrant locations, the battery storage and quarantine positions, and the hazardous materials summary maintained for the emergency services;

7. Where a significant smoke plume develops: notify neighbouring occupancies on the affected side, and effect the aviation notification per the contact directory;
8. Account for all persons at the assembly point (section 5); report any unaccounted person to EMS immediately;
9. Make the section 30 notification where the fire involves or may involve release of hazardous substances (battery combustion products, contaminated run-off) – for a fire of any significance at this facility, this should be presumed to apply.

Recovery

- No re-entry until EMS declares the structure safe; treat burnt and heat-exposed batteries as unstable for at least 24 hours (reignition risk) – quarantine fire debris containing cells in non-combustible containers in open air, away from structures;
- Contain, sample and lawfully dispose of firewater and fire debris as hazardous waste via a licensed contractor with safe disposal certificates; remediate per the authorities' directives;
- Complete the section 30(6) written report within 14 days; notify the insurer; conduct the investigation; revise this Plan and the FRA with the lessons learned.

4.4 Spillage – on site

Prevention and preparedness

- Batteries and electrolyte-containing components handled and stored on impermeable surfaces; damaged units in quarantine containment; oils, coolants and process chemicals stored bunded with SDSs available;
- Spill kits (absorbent suitable for organic electrolytes, acid-resistant PPE, non-sparking tools, disposal bags) positioned per the equipment register; personnel trained in their use;
- Toner and fine dust managed by extraction and sealed handling to prevent dispersal.

Response

1. Evacuate the immediate area; don PPE per the SDS before approach; eliminate ignition sources – electrolyte vapours are flammable;
2. Stop the source where safely possible (right the container, transfer, plug); a leaking or venting battery is handled with insulated tools into quarantine containment, not bare-handed;
3. Contain the spill with absorbent socks/booms before it reaches drains; deploy drain covers; prevent wash-down to stormwater;
4. Absorb, collect and seal spill material and contaminated absorbent as hazardous waste; label and stage for licensed disposal;
5. Where the spill has entered or may enter the stormwater or sewer system, or otherwise meets the section 30 definition: apply section 3.3, including notification of Johannesburg Water;
6. Decontaminate the area; record the event; replenish the spill kit before work resumes.

4.5 Spillage – in transit

Applies to collection and dispatch of e-waste and lithium-ion batteries (UN 3480 / UN 3481, Class 9) on public roads, whether by the facility's vehicles or by contracted transporters, in line with the National Road Traffic Act 93 of 1996 and SANS 10231. Each vehicle must carry: the transport emergency card for the load, the contact directory card, a spill kit, an extinguisher, and PPE. Loads must be secured, segregated from incompatible materials, and batteries packaged to prevent short circuit and movement.

Response – driver's duties

1. Stop safely; switch off the engine; deploy the vehicle's warning triangle(s); keep bystanders and smokers away – establish an exclusion of at least 25 m for any battery involvement or vapour release;
2. Call the Emergency Co-ordinator immediately, stating location, load, nature and extent of the spillage and any injuries; where there is fire, injury or road obstruction, call the SAPS (10111) and EMS (10177) first;
3. If safe and trained: contain the spillage with the vehicle spill kit and keep material out of roadside drains – do not touch damaged batteries bare-handed and do not reload swollen, hot or venting units;
4. A battery showing thermal runaway indicators must not be fought by the driver beyond an incipient attempt with the vehicle extinguisher – withdraw upwind and await emergency services;
5. Remain at the scene until released; record the details and photograph the scene where safe.

Response – facility (consignor) duties

6. The Emergency Co-ordinator dispatches the spill response contractor and, where warranted, facility personnel with equipment to the scene;
7. Make the section 30 notification where hazardous substances have been or may be released to the environment (roadside soil, stormwater) – the duty applies equally to in-transit incidents and rests on the responsible person, including the owner of the substance;
8. Arrange recovery, lawful disposal of contaminated material, and remediation of the scene; obtain the incident report from the driver and any transporter; notify the insurer.

4.6 Natural disasters, including floods

Prevention and preparedness

- Roof, gutters, downpipes and yard drainage inspected and cleared before and during the rainy season; storage kept off the floor on pallets – with battery storage prioritised for elevated, water-protected positions, since water ingress into lithium-ion battery stock creates short-circuit and delayed thermal runaway risk;
- Severe weather monitoring (SAWS warnings) by the Emergency Co-ordinator; lightning protection status of the buildings [To be confirmed by the client];
- Sandbags or barriers available for doorways vulnerable to stormwater ingress [To be confirmed by the client].

Response

1. On a severe storm or flood warning: suspend receiving and dispatch; secure yard storage and loose materials; verify battery stock is elevated and covered; charge and position lighting and communications for power loss (see 4.1, which commonly accompanies severe weather);
2. During flooding or ingress: isolate electrical supply to affected areas before contact with standing water; evacuate personnel from affected areas to upper levels or the assembly point as directed – do not walk or drive through moving water;
3. Prevent contact between floodwater and battery stock or hazardous materials; where contact has occurred, treat the affected stock as damaged: quarantine on receding of water, and monitor for heating for at least 72 hours;
4. Where hail, wind or lightning damages the structure: cordon damaged areas pending competent inspection; apply the structural failure scenario (4.8) as required;
5. Where floodwater has mobilised hazardous substances off site or into the stormwater system: apply section 3.3;

6. Liaise with the City of Johannesburg disaster management structures under the Disaster Management Act 57 of 2002 where the event forms part of a wider municipal emergency.

Recovery

- Competent inspection of electrical installations and structure before re-occupation; controlled drying, segregation and assessment of wetted stock; disposal of unrecoverable material as hazardous waste where applicable; incident record and insurer notification.

4.7 Medical emergency

1. Summon the nearest first aider; call EMS (10177) for any serious injury, electrical contact, chemical exposure or smoke inhalation; state the access gate to be used;
2. For chemical or electrolyte exposure: flush affected skin or eyes with water for at least 15 minutes; provide the SDS to the medical responders; for HF-suspected exposure from battery combustion products, state this expressly to EMS;
3. Do not move a seriously injured person except to remove them from immediate danger; keep the route to the casualty clear for EMS;
4. Record the injury; assess reportability under OHSA section 24 and, where reportable, notify the Department of Employment and Labour and preserve the scene as required.

4.8 Structural failure

1. Evacuate and cordon the affected area; account for personnel; call EMS where any person is trapped – do not attempt rescue within an unstable structure;
2. Isolate electricity and any services to the affected area;
3. Obtain a competent person's inspection before re-entry; report to the local authority where required by the National Building Regulations.

4.9 Hazardous gas or fume release

1. Evacuate upwind; treat any battery venting event as a precursor to fire – apply 4.3 in parallel;
2. Increase ventilation where controls allow and it is safe; eliminate ignition sources; only trained personnel with respiratory protection may approach;
3. Call EMS for any exposure symptoms (respiratory irritation, dizziness); apply section 3.3 where the release may affect persons or the environment off site.

4.10 Civil unrest or security incident

1. Lock down the facility; keep personnel inside away from street-facing openings; do not confront intruders;
2. Call the SAPS (10111) and armed response [provider: _____]; the Emergency Co-ordinator accounts for personnel and controls communications;
3. Suspend receiving and dispatch; where safe, secure battery and hazardous material storage against interference; resume operations only on the Emergency Co-ordinator's instruction.

5. Evacuation

- On the evacuation alarm, all persons stop work, make equipment safe only where this can be done in seconds (release, switch off), and proceed by the nearest escape route to the assembly point: [designated position – to be designated by the client; the position must be off the facility footprint, upwind-flexible, and clear of the fire service approach];
- Escape routes and exits per the evacuation layout displayed at the facility; routes must be kept clear at all times; cage gates on escape routes must be openable from inside without a key while areas are occupied (FRA action A5);
- Area wardens / fire team members sweep their areas, close doors and gates behind them, and report their area clear or otherwise to the Emergency Co-ordinator;
- Roll call is taken at the assembly point against the daily attendance and visitor registers; drivers and contractors on site report to the assembly point; any unaccounted person is reported to the emergency services immediately with their last known location;
- Persons requiring assistance to evacuate are identified in advance and assigned a buddy; visitors are escorted by their host;
- No person re-enters until the Emergency Co-ordinator declares the all-clear on the signal in section 3.1.

6. Emergency equipment register

The register below records the minimum emergency equipment for the facility; quantities and exact positions are recorded and maintained in the client's equipment register.

Equipment	Location	Inspection / servicing
Portable fire extinguishers (DCP / CO ₂)	Per fire equipment register	Monthly visual; annual service per SANS 10105-1
Lithium-ion compatible extinguishing agent (e.g. water mist / encapsulator units)	Battery storage, dismantling and processing areas [per FRA action A3]	Monthly visual; per supplier schedule
Fire hose reels / hydrants	[To be confirmed by the client]	Per SANS servicing schedule
Battery quarantine containers (non-combustible)	Quarantine area [per FRA action A1]	Weekly inspection
Spill kits (general and electrolyte-suitable absorbent, PPE, disposal bags)	Receiving, dismantling, battery areas, dispatch vehicle(s)	Monthly inventory check
Drain covers / stormwater isolation means	Yard and receiving areas [per FRA action A10]	Monthly inspection
First aid boxes	Per GSR requirements; workstations and offices	Monthly inventory check
Emergency lighting and exit signage	Escape routes and exits [per FRA action A5]	Monthly function test
Backup generator and fuel (external designated position)	[Location per FRA action A2]	Weekly start test; fuel log
Emergency alarm / signalling device	[Type and location]	Monthly test
PPE: heat-resistant gloves, face shields, respirators (ABEK-P3 or per SDS)	Battery handling and spill response points	Monthly inventory check

7. Training, drills and exercises

Training / exercise	Who	Frequency
Induction: emergency procedures, alarm, evacuation, assembly	All personnel, contractors and regular drivers	On appointment and annual refresher
Fire extinguisher use, incl. LIB-specific media and the decision to withdraw	Fire team and battery-area personnel	Annual
Battery hazard awareness: damage recognition, quarantine, thermal runaway indicators (heat, swelling, venting, odour)	All battery-handling personnel	On appointment and annual
Spill response (site and transport)	Fire team, dispatch personnel, drivers	Annual
First aid (registered course)	Appointed first aiders	Per certificate validity
Evacuation drill (full site)	All personnel	Six-monthly; one drill per year unannounced
Emergency Co-ordinator tabletop exercise (scenario-based, incl. s30 notification walkthrough)	Emergency Co-ordinator, deputies, fire team leader	Annual

Evacuation drills are planned, executed and evaluated using the Emergency Evacuation Drill Checklist in Annexure A. Training and drill records, including the completed checklists and corrective actions, are retained for a minimum of five years and made available to the authorities on request.

8. Incident reporting, investigation and recovery

- All emergencies, near-misses and abnormal events are recorded in the incident register within 24 hours, stating date, time, location, persons involved, description, response actions and notifications made;
- The Emergency Co-ordinator initiates an investigation proportionate to the event, identifying immediate and root causes and corrective actions with owners and dates; OHSA section 24/25 reportability and NEMA section 30 reporting are assessed for every incident;
- Recovery actions – structural and electrical clearance, stock assessment and quarantine, waste classification and lawful disposal, remediation, insurer processes – are tracked to close-out;
- Corrective actions arising from incidents, drills and audits feed the review process in section 9.

9. Plan review and version control

- This Plan is reviewed: annually; after any emergency or significant near-miss; on any material change to layout, process, throughput or occupancy (including commissioning of the PCB and battery plants); on issue of the Waste Management Licence or the EMPr (alignment review – refer optional service D of the engagement); and on any relevant legislative change;
- Amendments are recorded in the revision table below; superseded versions are withdrawn from display points; the current version is displayed per section 3.4 and communicated at toolbox talks.

Rev	Date	Description	Approved by
0	21/07/2026	First issue	[]

Annexure A – Emergency Evacuation Drill Checklist

This checklist is completed for every evacuation drill (six-monthly, of which at least one per year is unannounced). The completed checklist, together with the corrective actions arising, is filed as a drill record in terms of section 7 of this Plan.

Date of drill	
Time commenced	
Drill scenario (vary; include a battery-area scenario at least annually)	
Announced / unannounced	
Drill co-ordinator	
Observers and stations	

Part A – Planning (before the drill)

Item	Done (✓)	Notes
Scenario, date and time approved by the Emergency Co-ordinator		
Observers appointed and briefed; stationed at the alarm point, principal escape routes and the assembly point		
Alarm monitoring company and/or emergency services advised, where applicable, to prevent false dispatch		
Neighbouring occupancies advised where the drill may be visible or audible to them		
Visitors and contractors on site included in the scope of the drill		
Attendance and visitor registers, stopwatch and this checklist available at the assembly point		

Part B – Execution (record times)

Milestone	Time	Notes
Alarm raised		
Evacuation commenced		
First person at assembly point		
Last person at assembly point		
Roll call completed		
All-clear given and re-entry commenced		
Total evacuation time (alarm to last person at assembly), minutes		

Part C – Observations

Observation	Yes / No / N/A	Comment
Alarm clearly audible in all areas, including caged storage areas, the yard and the upper floors		
All personnel stopped work immediately and made equipment safe only where achievable in seconds		

Escape routes and exits unobstructed; cage gates on escape routes openable from inside without a key		
Area wardens / fire team swept their areas, closed doors and gates, and reported their areas clear		
Personnel used the nearest escape route and did not detour for belongings or vehicles		
Assembly point reached without crossing the fire service approach or public roadways unsafely		
Roll call accurate against the attendance and visitor registers; result reported to the Emergency Co-ordinator		
Persons requiring assistance were assisted in accordance with their buddy assignments		
Visitors and contractors were escorted by their hosts and accounted for		
The Emergency Co-ordinator maintained control and communications throughout		
Simulated external notifications executed correctly, including a section 30 NEMA notification walkthrough where the scenario involves a release		
Re-entry occurred only on the all-clear signal		

Part D – Debrief and corrective actions

Finding	Corrective action	Owner	Target date

Drill evaluated by (name, signature, date)	
Emergency Co-ordinator (name, signature, date)	
Next drill due (date; announced / unannounced)	