



**NEW GX ENVIRO SOLUTIONS AND
LOGISTICS HOLDINGS (PTY) LTD**

**KWAGGASRAND RECYCLING FACILITY
UPGRADE – DRAFT ENVIRONMENTAL
IMPACT ASSESSMENT REPORT**

Locality: Pretoria

Departmental Ref No: Gaut: 002/14-15/W0015

SHANGONI
Management Services (Pty) Ltd



DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

New GX Enviro Solutions and Logistics Holdings (Pty) Ltd

Kwaggasrand Recycling Facility Upgrade – draft EIR

Locality: Pretoria

Departmental Ref No: Gaut: 002/14-15/W0015

September 2015

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PROJECT DETAILS

Gauteng Department of Agriculture and Rural Development

Reference No.: Gaut: 002/14-15/W0015

Project Title: Kwaggasrand Recycling Facility Upgrade

Project Number: NEW-KWA-14-09-11

Compiled by: Lizette Crous

Date: 30 September 2015

Technical Reviewer: Lourens de Villiers



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EXECUTIVE SUMMARY

The Applicant

New GX Enviro Solutions Logistics Holdings (Pty) Ltd is a waste management company specialising in the provision of waste disposal and recycling solutions.

In 2011, New GX was adjudicated a tender (Tender CB124/2010) by the City of Tshwane Metropolitan Municipality (CTMM) to provide the following services in Region 3 and Region 4 of the City of Tshwane:

- Weekly waste collection;
- Litter picking;
- Illegal dumping clearance; and
- Skip removal services, as and when required.

Through the fulfilment of the above mentioned tender, New GX currently provides employment to 120 local residents and further develops local Small, Medium and Micro-sized Enterprises (SMMEs). The company is also contractually required to support community based recycling initiatives and establish a buy-back centre or centres.

Background description

New GX is leasing the project property (Portion 463 of the farm Pretoria Town and Townlands 351 JR) from the CTMM. An existing recycling facility, the Kwaggasrand Recycling Facility, is located on the eastern part of the property and has been operational for more than ten years.

Project description

A waste recycling facility exists for the sorting, screening, balling and/or crushing of the following recyclables:

- Cardboard;
- Paper;
- Plastic;
- Cans; and
- Glass.

Phase 1A: Currently, the manual sorting at the existing facility has been temporarily ceased, as of the 1st of December 2013. This is due to the fact that the adjacent Kwaggasrand landfill site has closed, as it had reached its disposal capacity. A Materials Recovery Facility (MRF) is being introduced adjacent to the existing recycling building to optimise the recycling facility. The processing capacity of the facility will stay the same and the installation of the MRF therefore does not form part of the Waste Management Licence application as the same processes will occur, only via a more efficient system.

The proposed project involves the upgrading of the Kwaggasrand Recycling Facility into a multi-purpose waste recycling facility (the activities being applied for as a part of this Waste Management Licence application). The project will entail the following three phases.

Phase 1B of the project: The construction of new infrastructure in support of the existing recycling facility in order to optimise and increase the throughput capacity of the facility. This phase entails the establishment of a Waste Transfer Station and the throughput capacity of the recycling facility will be increased to $\pm 783.57 - 912.9$ tons per day of dry and wet waste that hasn't been recycled by households and businesses. The infrastructure will include, for example, a docking/parking area for the dumping of waste and refuse loads, a waste and refuse storage area, parking areas, a staff canteen, offices, an education centre and ablution facilities. Designs for the upgrade of the recycling facility have been finalised and are included in Section 1.5.3 and attached under Appendix C of this report.

Wet waste will be managed in two ways at the facility. In the first process, the wet waste will be separated from the dry waste and can then be channelled towards one of two processes. In the first process, the wet waste will either be loaded into open top bins and taken to a licensed, off-site bio-digester/gasifier for further processing or it will be air dried onsite to produce Refuse Derived Fuel ('RDF'). The applicant is also proposing to install a bio-digester/gasifier at the Kwaggasrand Recycling Facility, but this technology requires authorisation from the National Department of Environmental Affairs. Once such authorisation has been received, the wet waste will be fed into the onsite bio-digester/gasifier. In the second process, the recyclable fractions will be removed and the remaining wet waste will be baled. Wastewater from this process will be treated and released into the municipal sewage system.

Phase 1B will only make provision for the recycling of the new, "wet waste" waste stream. This phase will not increase the capacity or change the nature of waste that will be recycled as part of Phase 1A of the project (MRF).

Phase 2 of the project:

Green waste: A composting facility will be set up on open land west of the above mentioned recycling building. Phase 2 will also include the establishment of a storage area for baled and plastic wrapped refuse.

Phase 3 of the project: A building rubble crushing plant will also be erected on open land to the west of the above mentioned recycling building. Phase 3 will also entail the establishment of a Waste Tyre Crumbing Facility where waste tyres will be de-beaded, cut, shredded, screened and grinded into rubber crumbs.



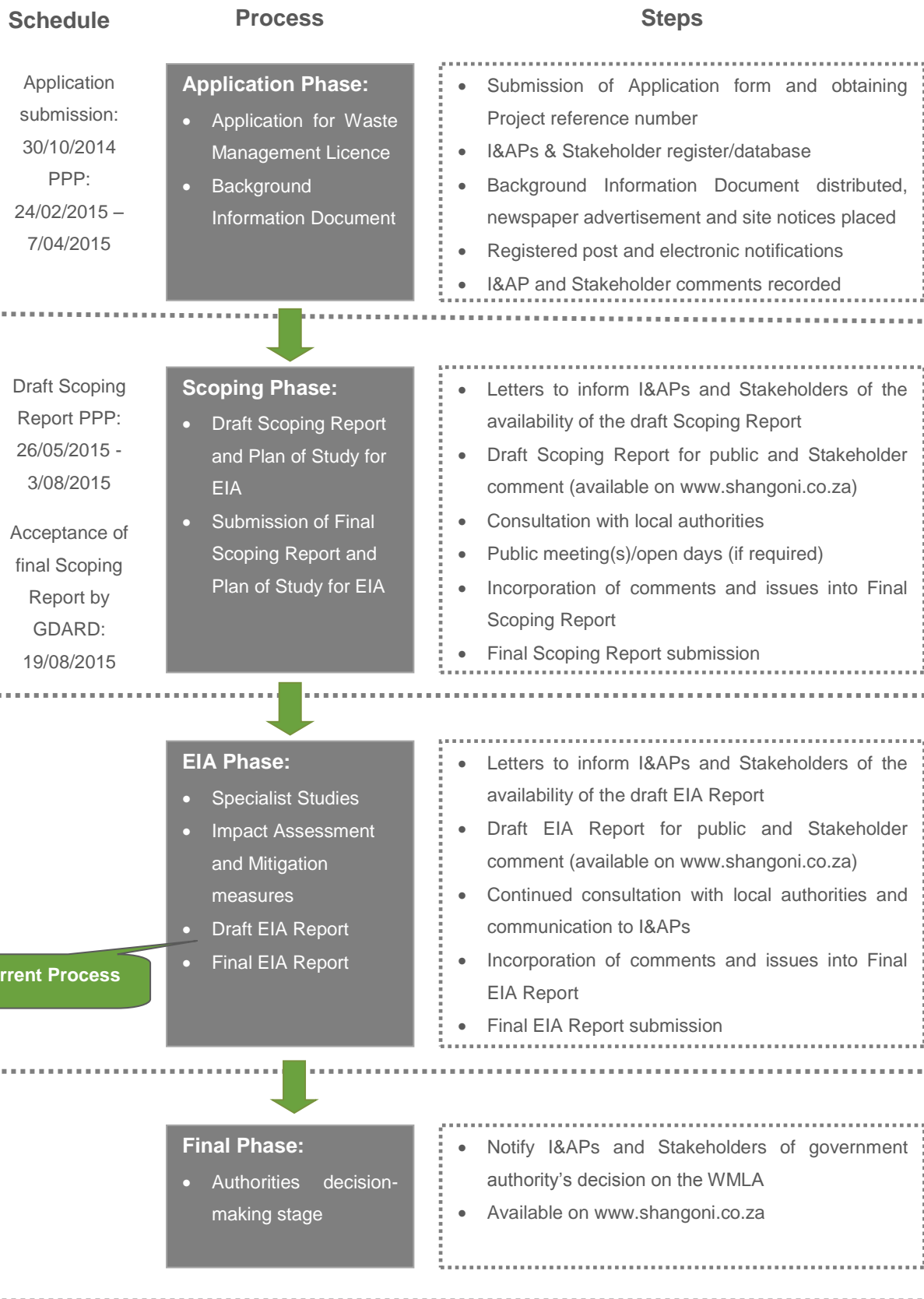
Legal requirements and legislative process

Proposed waste management activities at the recycling facility trigger listed waste management activities in terms of the National Environmental Management: Waste Act, Act 59 of 2008 (NEM:WA, 2008) and the regulations there under. Relevant listed activities triggered by the proposed activities are described further in this draft Environmental Impact Assessment Report (EIR) (refer to Part 1.5).

It is the intention of this EIR to provide the necessary information pertaining to the proposed activities associated with the project, as required in terms of the Environmental Impact Assessment Regulations (EIA Regulations R543: EIA Regulations in terms of Chapter 5 of the NEMA, 1998, dated June 2010) under the NEMA, 1998, and NEM:WA, 2008. This draft EIR intends to highlight all information relevant to the proposed recycling facility upgrade project.

The diagram below provides a visual representation of the Scoping- and EIA approach followed in terms of NEM:WA, 2008, NEMA, 1998, and the Environmental Impact Assessment Regulations, dated 2010.





Environmental impacts associated with the project

The purpose of this document is to supply the Gauteng Department of Agriculture and Rural Development with the requested information pertaining to the National Environmental Management: Waste Act (NEM:WA), the National Environmental Management Act (NEMA), as amended, and Regulation 28 of the Environmental Impact Assessment Regulations, dated 2010. Contained in this document is a detailed investigation of the activity and potential site-specific impacts associated with the Kwaggasrand Recycling Facility upgrade project.

This application for authorisation by way of a Waste Management Licence for the above mentioned project entails conducting a full Scoping and Environmental Impact Assessment process. During the Environmental Scoping Report (ESR) phase and draft Environmental Impact Report (EIR) phase, the baseline potential impacts related to the upgrading of the Kwaggasrand Recycling Facility have been identified.

Regulation 31 (of Regulation 543) of the EIA Regulations, 2010, under the NEMA, 1998, requires that an Environmental Impact Assessment Report (EIR) includes an assessment of the status, extent, duration, probability, reversibility, replaceability of resources and mitigatory potential of the major potential environmental impacts of the proposed project be undertaken. Refer to Part 7 of this report for a detailed risk assessment.

Potential significant impacts that have been identified during the scoping and environmental impact assessment process have been listed below. Closure and decommissioning of the recycling facility is not anticipated for the foreseeable future. Should the facility close, a detailed closure and rehabilitation plan will be submitted to the Gauteng Department of Agriculture and Rural Development prior to decommissioning.

- Environmental impacts due to poor design and planning of the recycling facility upgrades;
- Formation of subsidence features in dolomite residuum areas;
- Soil, surface water and ground water pollution due to incorrect management and disposal of cement and concrete;
- Soil, surface water and ground water pollution due to ineffectively treated wastewater entering the environment;
- Soil, surface water and ground water pollution due to the run-off of contaminated wash water;
- Soil pollution and degradation due to incorrect management, storage and disposal of construction waste, general waste and hazardous waste;
- Soil, surface water and ground water pollution due to unsanitary conditions onsite;
- Soil, surface water and ground water pollution due to inadequate storage of tyres and rubber crumbs;
- Soil, surface water and ground water pollution due to the incorrect management, storage and disposal of chemicals and oil;



- Compromisation of the municipal sewage system's efficacy;
- Soil, surface water and ground water pollution due to affected stormwater runoff;
- Destruction and deterioration of natural, sensitive vegetation to the South of the site boundary;
- The spread of alien and invasive plant species from the site into the natural vegetation area to the south of the site boundary;
- Disturbance and displacement of fauna species onsite;
- Degradation and loss of topsoil;
- Soil erosion;
- Generation of noise pollution and nuisance;
- Degradation of ambient air quality due to dust generation;
- Increased traffic flow to the site and potential strain on existing road infrastructures as well as creating a higher risk of vehicular accidents on the access roads;
- The generation of odours and nuisance from the waste handled onsite;
- Nuisance and an unsightly appearance to people in the vicinity of the recycling facility due to windblown litter/waste;
- Release of atmospheric emissions due to fire establishment from to the storage of large quantities of waste materials, both before and after processing at the recycling facility, as well as the storage of waste tyres and rubber crumbs;
- Wear of access roads, accidents on access roads, unpermitted transport of materials and loss of materials being transported on access roads;
- Groundwater contamination from waste leachate from the composting facility; and
- Potential loss of artefacts or sites protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999).

The table below summarises the impacts that have been identified and evaluated for the recycling facility upgrade project.



Table 1: A summary of the impacts associated with the proposed upgrading of the Kwaggasrand Recycling Facility project

Potential Impact	Environmental Significance Pre Mitigation			Environmental Significance Post Mitigation		
	P ¹	M ²	S ³	P	M	S
Planning and Design Phase						
<ul style="list-style-type: none"> Non-compliance to environmental legislation. Air pollution (generation of dust) due to the inadequate design of the Recycling Facility. Soil erosion due to the inadequate design of the Recycling Facility. Contaminated runoff from waste handling areas. Leachate from the composting facility. Leachate from the waste tyre storage and crumbing facility. 	3	3	M	2	2	L
Formation of subsidence features in dolomite residuum areas.	4	4	H	2	3	M
<ul style="list-style-type: none"> Soil, stormwater or groundwater pollution due to the inadequate design and installation of the sewerage pipeline system. Wastage of a valuable natural resource (water) due to the inadequate design and installation of the water pipeline system. 	3	3	M	2	2	L
Soil, stormwater or groundwater pollution due to the inadequate design of the ablution facilities.	2	3	M	1	2	L
<ul style="list-style-type: none"> Delays due to poor planning. Legal non-compliances to the Waste Management Licence and EMP. Harm to the environment. 	3	3	M	1	2	L
Environment in General						
Harm to the environment in general (this includes pollution of soil and water resources, as well as harm to employees and wasteful practices in terms of resource use and waste management).	3	3	M	2	2	L
Fauna and Flora						
Destruction of natural, sensitive vegetation (beyond the site's boundaries).	3	3	M	2	2	L
Deterioration of sensitive vegetation due to edge effects.	3	3	M	2	2	L
Spread of alien invasive plant species from the transformed site to the natural vegetation that will result in the deterioration of	4	3	H	2	2	L

¹ Probability² Magnitude³ Severity

Potential Impact	Environmental Significance Pre Mitigation			Environmental Significance Post Mitigation		
	P ¹	M ²	S ³	P	M	S
the sensitive ridge vegetation.						
Disturbance and displacement of fauna species onsite.	3	3	M	2	2	L
The use of poison to control pests negatively impacts upon untargeted animals such as birds, cats and dogs.	3	3	M	2	2	L
Topsoil and Erosion						
Degradation and loss of a valuable resource (topsoil) through increased runoff as stormwater flows over cleared, bare areas during rainfall events.	4	2	M	3	1	L
Degradation and loss of a valuable resource (topsoil).	3	3	M	2	2	L
Erosion of cleared areas.	4	3	H	3	2	M
Ineffective rehabilitation causing soil erosion and the generation of dust.	3	3	M	2	2	L
Soil erosion due to improper management of stormwater onsite.	4	3	H	1	3	L
Soil, surface water, stormwater and groundwater						
Soil and surface water pollution due to the incorrect management of cement and concrete.	3	3	M	2	2	L
Soil and surface water pollution due to the release of contaminated wash water into the environment.	2	3	M	2	2	L
Soil, surface water and groundwater pollution from incorrect waste management practices. Nuisance caused by odours and unsightly appearance of waste onsite.	3	3	M	2	2	L
Soil, surface water and groundwater pollution as a result of unsanitary conditions onsite.	2	3	M	1	3	L
Chemical and hydrocarbon pollution of soil, stormwater and groundwater due to the chemical-, fuel-, grease- or oil spillages or leaking equipment and vehicles.	3	3	M	1	3	L
Soil and surface water pollution due to the contamination of clean stormwater runoff.	3	3	M	2	2	L
The release of treated wastewater into the municipal sewage system and compromising the municipal system's efficiency.	3	3	M	2	2	L
Soil and groundwater pollution from leaking or broken sewerage pipes.	2	3	M	2	2	L
Incorrect storage of waste tyres and rubber crumbs resulting in soil, stormwater and groundwater pollution.	3	4	H	2	2	L
Composting processes may lead to groundwater contamination from waste leachate.	3	3	M	2	2	L
Atmosphere and Noise						
• Generation of noise and nuisance to neighbours as a result of construction activities occurring during inconvenient times of the day.	3	3	M	2	2	L



Potential Impact	Environmental Significance Pre Mitigation			Environmental Significance Post Mitigation		
	P ¹	M ²	S ³	P	M	S
• Noise disturbance and nuisance to neighbours and other sensitive receptors due to operational activities.						
Ambient air quality degradation as well as disturbance and nuisance to neighbours and other sensitive receptors due to dust generated from onsite traffic.	3	3	M	2	2	L
Release of atmospheric emissions from potential burning of stockpiled tyres, rubber crumbs or waste due to unsafe storage practices that result in the establishment of fires.	3	4	H	2	2	L
Generation of atmospheric emissions, odours and nuisance to neighbours due to activities at the recycling facility, and in particular, at the composting facility.	3	3	M	2	2	L
Nuisance and an unsightly appearance to people in the vicinity of the recycling facility due to windblown litter/waste.	3	3	M	1	2	L
Infrastructure						
Wear of access roads, accidents on access roads, unpermitted transport of materials and loss of materials being transported on access roads.	4	3	M	2	2	L
Resource usage						
Wastage or depletion of a valuable resources (water and electricity) due to inefficient or redundant usage.	3	2	M	1	2	L
Visual						
Negative impact on neighbours and motorist having to see the recycling facility from their residences and Maunde Street, respectively.	5	3	H	3	2	M
Heritage and Palaeontological						
Loss of heritage artefacts or sites protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999).	2	3	M	2	2	L
Loss of fossils protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999).	4	3	H	4	2	M



Appropriate mitigation measures will assist in minimising the potential impacts on the surrounding environment during the construction and operational phases of the proposed project. A draft Environmental Management Programme (EMP) has also been compiled, with the aim of serving as a working document in order to manage and/or mitigate the identified potential impacts. Refer to Appendix F for a copy of the draft EMP.

Based on the outcomes of the Environmental Impact Assessment, conducted as part of this full Scoping and Environmental Impact Assessment process, as well as the alternatives assessment, the following recommendations are made:

1. **The proposed project (the upgrading of the Kwaggasrand Recycling Facility) should be authorised and allowed to proceed on the preferred site (25°46'30.757"S; 28°5' 42.494"E);**
2. The mitigation measures proposed in this report and the draft Environmental Management Programme must be implemented during all phases of the proposed project;
3. It is assumed that the mitigation measures proposed in this report and the draft Environmental Management Programme will be correctly implemented by the applicant and that they will be effective;
4. A communications pathway must be established that would allow the designated ECO to accept and deal with stakeholder complaints;
5. Proposed mitigation measures should be incorporated as far as possible into the operational plan for the recycling facility; and
6. Strict monitoring and enforcement of requirements of the EMP must be undertaken to ensure that contractors and operators adhere to these requirements.



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DEFINITIONS

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 [*NEM: WA, (Act No. 59, 2008)*].

Demography

The scientific study of human population, especially, with reference to their size, structure and distribution.

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 [*NEM: WA, (Act No. 59, 2008)*].

Environment

The surroundings (biophysical, social and economic) within which humans exist and that are made up of

- (i) the land, water and atmosphere of the earth;
- (ii) micro-organisms, plant and animal life;
- (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and
- (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Aspects

Elements of an organisation's activities, products or services that can interact with the environment.

Environmental Degradation

Refers to pollution, disturbance, resource depletion, loss of biodiversity, and other kinds of environmental damage; usually refers to damage occurring accidentally or intentionally as a result of human activities.

Environmental Impacts

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.



Environmental Impact Assessment

A study of the environmental consequences of a proposed course of action.

Environmental Impact Report

A report assessing the potential significant impacts as identified during the environmental impact assessment.

Environmental impact

An environmental change caused by some human act.

General Waste

Means waste that does not pose immediate hazard or threat to health or to the environment, and includes-

- (a) domestic waste;
- (b) building and demolition waste;
- (c) business waste; and
- (d) inert waste [NEM: WA, (Act No. 59, 2008)].

Hazardous waste

Means any waste that contains organic or inorganic elements compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment [NEM: WA, (Act No. 59, 2008)].

Land use

The various ways in which land may be employed or occupied. Planners compile, classify, study and analyse land use data for many purposes, including the identification of trends, the forecasting of space and infrastructure requirements, the provision of adequate land area for necessary types of land use, and the development or revision of comprehensive plans and land use regulations.

Pollution

Pollution means any change in the environment caused by -

- (i) substances;
- (ii) radioactive or other waves; or
- (iii) noise, odours, dust or heat,

emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity



of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future [NEM: WA, (Act No. 59, 2008)].

Pollution Prevention

Any activity that reduces or eliminates pollutants prior to recycling, treatment, control or disposal.

Public Participation Process

A process of involving the public in order to identify needs, address concerns, in order to contribute to more informed decision making relating to a proposed project, programme or development.

Recovery

In terms of the Waste Tyre Regulations, 2009, means the controlled extraction of a material or the retrieval of energy from waste tyres.

Recycle

In terms of the Waste Tyre Regulations, 2009, means the separation and processing of materials from waste tyres for further use as new products or resources.

Registered Interested and Affected Party

In relation to an application, means an interested and affected party whose name is recorded in the register opened for that application.

Topography

Topography, a term in geography, refers to the "lay of the land" or the physio-geographic characteristics of land in terms of elevation, slope and orientation.

Tyre

In terms of the Waste Tyre Regulations, 2009, means a continuous pneumatic covering made of natural rubber or synthetic rubber or a combination of natural and synthetic rubber encircling a wheel, whether new, used or re-treaded.

Vegetation

All of the plants growing in and characterising a specific area or region; the combination of different plant communities found there.



Waste

As per the definition of the National Environmental Management Waste Act, Act 59 of 2008 - means any substance, whether or not that substance can be reduced, re-used, recycled and recovered—

- (a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- (b) which the generator has no further use of for the purposes of production;
- (c) that must be treated or disposed of; or
- (d) that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but—
 - (i) a by-product is not considered waste; and
 - (ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste.

Waste Tyre

In terms of the Waste Tyre Regulations, 2009, means a new, used, re-treaded, or un-roadworthy tyre, not suitable to the re-treaded, repaired, or sold as a part worn tyre and not fit for its original intended use.

Waste Tyre Processor

In terms of the Waste Tyre Regulations, 2009, means any person or entity that is engaged in the commercial re-use, recycling or recovery of waste tyres.



ABBREVIATIONS

BID	-	Background Information Document
CRR	-	Comments and Responses Report
DWS	-	Department of Water and Sanitation
EAP	-	Environmental Assessment Practitioner
EIA	-	Environmental Impact Assessment
EIR	-	Environmental Impact Report
EMF	-	Environmental Management Framework
EMP	-	Environmental Management Programme
GDARD		Gauteng Department of Agriculture and Rural Development
GN	-	Government Notice
I&AP	-	Interested and Affected Party
IDP	-	Integrated Development Plan
NEMA	-	Environmental Management Act, 1998 (Act No. 107 of 1998) as amended
NEM:WA	-	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), as amended
R	-	Regulation
S&EIR	-	Scoping and Environmental Impact Reporting
SAHRA	-	South African Heritage Resources Agency
SWMP	-	Storm Water Management Plan



1. INTRODUCTION

This draft Environmental Impact Assessment Report forms part of an application for a Waste Management Licence for waste management activities associated with the proposed recycling facility upgrade project on Portion 463 of the farm Pretoria Town and Townlands, 351 JR, Gauteng Province. The application is made in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice No. 921 of 29 November 2013.

The application process is undertaken on behalf of the applicant, New GX Enviro Solutions and Logistics Holdings (Pty) Ltd, by Shangoni Management Services (Pty) Ltd. Shangoni was appointed, as independent environmental practitioner, to assist the applicant in undertaking the process as prescribed in the above mentioned environmental legislation.

A Waste Management Licence Application was submitted to the identified competent authority (the Gauteng Department of Agriculture and Rural Development). The Department subsequently registered the project and the formal process was thereby initiated. All the findings from the scoping process are included in this report.

This Environmental Impact Assessment Report is divided into the following parts:

- Part 1: Introduction (including a description of the project).
- Part 2: Nature and extent of the environment affected by activity.
- Part 3: Applicable legislation and guidelines.
- Part 4: Public Participation Process.
- Part 5: Need and desirability for the project.
- Part 6: Description of alternatives.
- Part 7: Environmental Impact Assessment.
- Part 8: Environmental Impact Assessment Statement.
- Part 9: Conclusion.

1.1 Process followed

1.1.1 The EIR in terms of the requirements of NEMA, 1998, and NEM:WA, 2008

Regulation 28(1) of the EIA Regulations, 2010 under the NEMA, 1998, lists aspects that must be included in EIA Reports (EIRs). The table below indicates the parts where information has been provided as part of this draft EIR:

Table 2: The Environmental Impact Assessment Report in terms of the EIA Regulations, 2010, under the NEMA, 1998

Regulation No:	Description	EIR Part
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Regulation No:		Description	EIR Part
R543 Regulation 31(2)(a)		Details of the Environmental Assessment Practitioner (EAP).	Part 1 & Appendix F
	(i)	Details of the EAP who prepared the report.	
	(ii)	Details of the expertise of the EAP to carry out the environmental impact assessment.	
R543 Regulation 31(2)(b)		A description of the proposed activity.	Part 1
R543 Regulation 31(2)(c)		A description of the property on which the activity is to be undertaken and the location of the activity on the property.	Part 1
R543 Regulation 31(2)(d)		A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity.	Part 2
R543 Regulation 31(2)(e)		Details of the public participation process conducted:	Part 4 & Appendix D
	(i)	Steps undertaken in accordance with the plan of study.	
	(ii)	List of persons, organisations and organs of state that were registered as interested and affected parties.	
	(iii)	A summary of comments received from, and a summary of issues raised by registered interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments.	
	(iv)	Copies of any representations and comments received from registered interested and affected parties.	
R543 Regulation 31(2)(f)		A description of the need and desirability of the proposed activity.	Part 5
R543 Regulation 31(2)(g)		A description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity.	Part 6, 7 & 8
R543 Regulation 31(2)(h)		An indication of the methodology used in determining the significance of potential environmental impacts.	Part 7
R543 Regulation 31(2)(i)		A description and comparative assessment of all alternatives identified during the environmental impact assessment process.	Part 6 & 8



Regulation No:	Description	EIR Part
R543 Regulation 31(2)(j)	A summary of the findings and recommendations of any specialist reports or report on a specialised process.	Part 2 & 7
R543 Regulation 31(2)(k)	A description of all environmental issues that were identified during the environmental impact assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures.	Part 7
R543 Regulation 31(2)(l)	An assessment of each identified potentially significant impact, including:	Part 7
	(i) Cumulative impacts.	
	(ii) The nature of the impact.	
	(iii) The extent and duration of the impact.	
	(iv) The probability of the impact occurring.	
	(v) The degree to which the impact can be reversed.	
	(vi) The degree to which the impact may cause irreplaceable loss of resources.	
(vii) The degree to which the impact can be mitigated.		
R543 Regulation 31(2)(m)	A description of any assumptions, uncertainties and gaps in knowledge.	Part 9 (if applicable)
R543 Regulation 31(2)(n)	A reasoned opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	Part 9
R543 Regulation 31(2)(o)	An environmental impact statement which contains:	Part 8
	(i) A summary of the key findings of the environmental impact assessment.	
	(ii) A comparative assessment of the positive and negative implications of the proposed activity and identified alternatives.	
R543 Regulation 31(2)(p)	A draft environmental management programme containing the aspects contemplated in Regulation 33 of the EIA Regulations, 2010.	Addendum A
R543 Regulation 31(2)(q)	Copies of any specialist reports.	Appendix E
R543 Regulation 31(2)(r)	Any specific information that may be required by the competent authority.	None at present*
R543 Regulation 31(2)(s)	Any other matters required in terms of sections 24(4)(a) and (b) of the Act.	None at present

* To date, no specific requests have been received from the competent authorities.



1.2 Details of the project applicant

Name of Applicant	New GX Enviro Solutions and Logistics Holdings (Pty) Ltd
Postal Address	P.O. Box 781902 Sandton 2146
Telephone No.	011 784 4048
Fax No.	086 577 6890
Farm name and portion on which the activities take place	Portion 463 of the farm Pretoria Town and Townlands 351 JR, Gauteng
Title Deed Number and 21 Digit Code	T0JR00000000035100463
Co-ordinates of operation	25°46'30.757"S; 28°5'42.494"E

1.3 Appointed Environmental Assessment Practitioner

Name of firm	Shangoni Management Services (Pty) Ltd	
Postal address	P.O. Box 74726 Lynnwood Ridge Pretoria 0400	
Telephone No.	012 807 7036	
Fax	012 807 1014/086 643 5360	
E-mail	lizette@shangoni.co.za	
Team of Environmental Assessment Practitioners on project		
Name	Qualifications & experience to conduct the EIA	Responsibility
Mr Lourens de Villiers	<ul style="list-style-type: none"> B.Sc. (Hons) (PU for CHE) MSc.(UP) More than 10 years' experience conducting Environmental Impact Assessments and Waste Management License Applications 	EIA Project Leader and Co-ordinator
Ms Lizette Crous	<ul style="list-style-type: none"> MSc. Environmental Management (University of London) More than 4 years' experience conducting Environmental Impact Assessments and Waste Management License Applications 	EAP
Ms Karien du Plessis	<ul style="list-style-type: none"> B.Sc. (Hons) Environmental Management Less than 1 years' experience conducting Environmental Impact Assessments and 	EAP

	Waste Management License Applications.	
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* Detailed CVs for the project team are attached (Appendix F).

1.4 Current situation

The Kwaggasrand Recycling Facility has been operational for more than 10 years. Currently, the manual sorting at the facility has been temporarily ceased, as of the 1st of December 2013. This is due to the fact that the adjacent Kwaggasrand landfill site has closed, as it had reached its disposal capacity. Waste now needs to be taken to the Onderstepoort landfill site. Phase 1A of the project, namely the installation of a Materials Recovery Facility (not part of this Waste Management Licence application) is currently being constructed onsite. A portion of the project property was also used as a temporary off-site construction camp by the CTMM. Waste dumping, soil stripping (as part of the rehabilitation phase of the adjacent landfill site) and small scale farming also occurred in the past. The remainder of the property is vacant.

Table 3: Surface rights holders relevant to the current operation(s)

Farm Name	Title deed	Owner
Portion 463 of the farm Pretoria Town and Townlands 351 JR	T114490/2002	City of Tshwane Metropolitan Municipality (CTMM)

1.5 Proposed activity(ies)

New GX Enviro Solutions and Logistics Holdings (Pty) Ltd is proposing to upgrade the Kwaggasrand Recycling Facility to a multi-purpose waste recycling facility. The proposed project arose when New GX realised that the CTMM faces a challenge with fast dwindling landfill airspace at a number of their landfill sites. The multi-purpose waste recycling facility will therefore aim to reduce the volume of waste being taken to the various landfill sites by removing the recyclable waste fraction from the waste stream intended for disposal and thereby extend the life span of the landfill sites.

The waste recycling facility is capable of sorting, screening, balling and/or crushing the following recyclables:

- Cardboard;
- Paper;
- Plastic;
- Cans; and
- Glass.

Phase 1A of the project (2.17ha): Currently, the manual sorting of waste at the existing recycling facility has been temporarily ceased, as of the 1st of December 2013. This is due to the fact that the adjacent Kwaggasrand landfill site has closed, as it had reached its disposal capacity. A Materials Recovery Facility (MRF) is being introduced adjacent to the existing recycling building onsite to

optimise the recycling facility. A MRF is a specialised plant that sorts mixed waste into separate waste streams/fractions through a combination of automated and manual processes. The processing capacity of the facility will stay the same and the installation of the MRF therefore does not form part of the Waste Management Licence application as the same processes will occur, only via a more efficient system.

A process flow for the Materials Recovery Facility is given below. From the MRF, the material will leave the site for use as raw materials in external manufacturing processes. The facility will also be open for local communities to drop off their sorted recyclable waste.

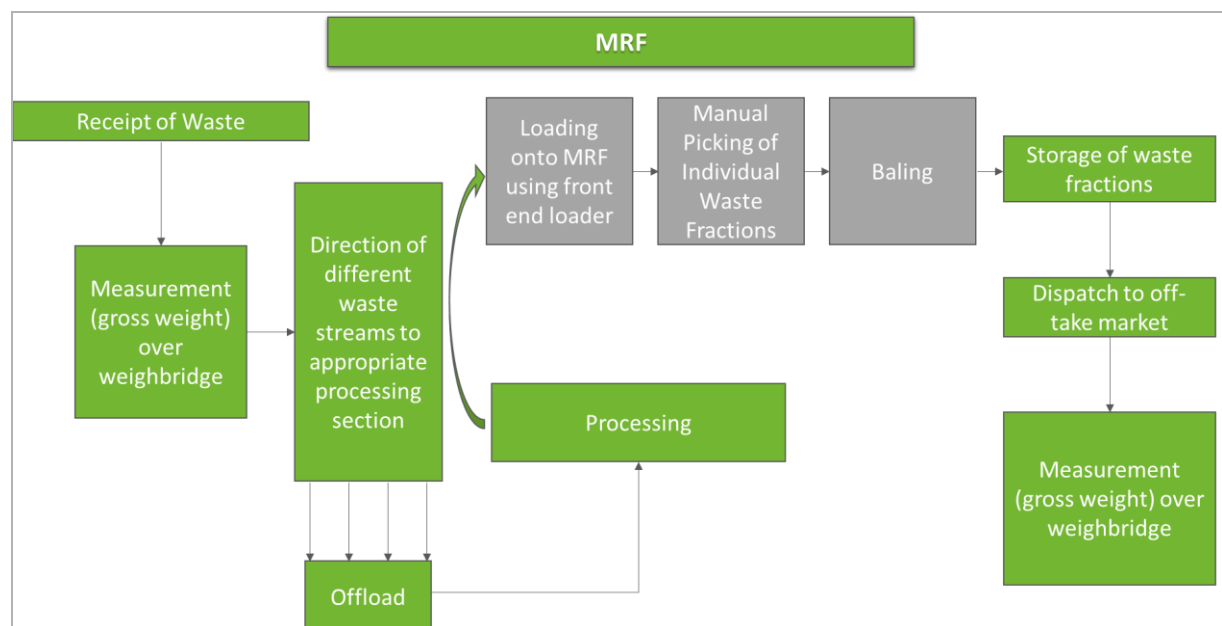


Figure 1: Flow diagram for the Materials Recovery Facility

The proposed upgrade of the waste recycling facility will commence in three phases (Phase 1B, Phase 2 and Phase 3), as shown in the figure below, and will cater for the processing of approximately 1 521.5 tons of the following waste materials per day:

- Cardboard;
- Paper;
- Plastics;
- Cans;
- Glass;
- Green waste;
- Wet waste;
- Building rubble; and
- Waste tyres.



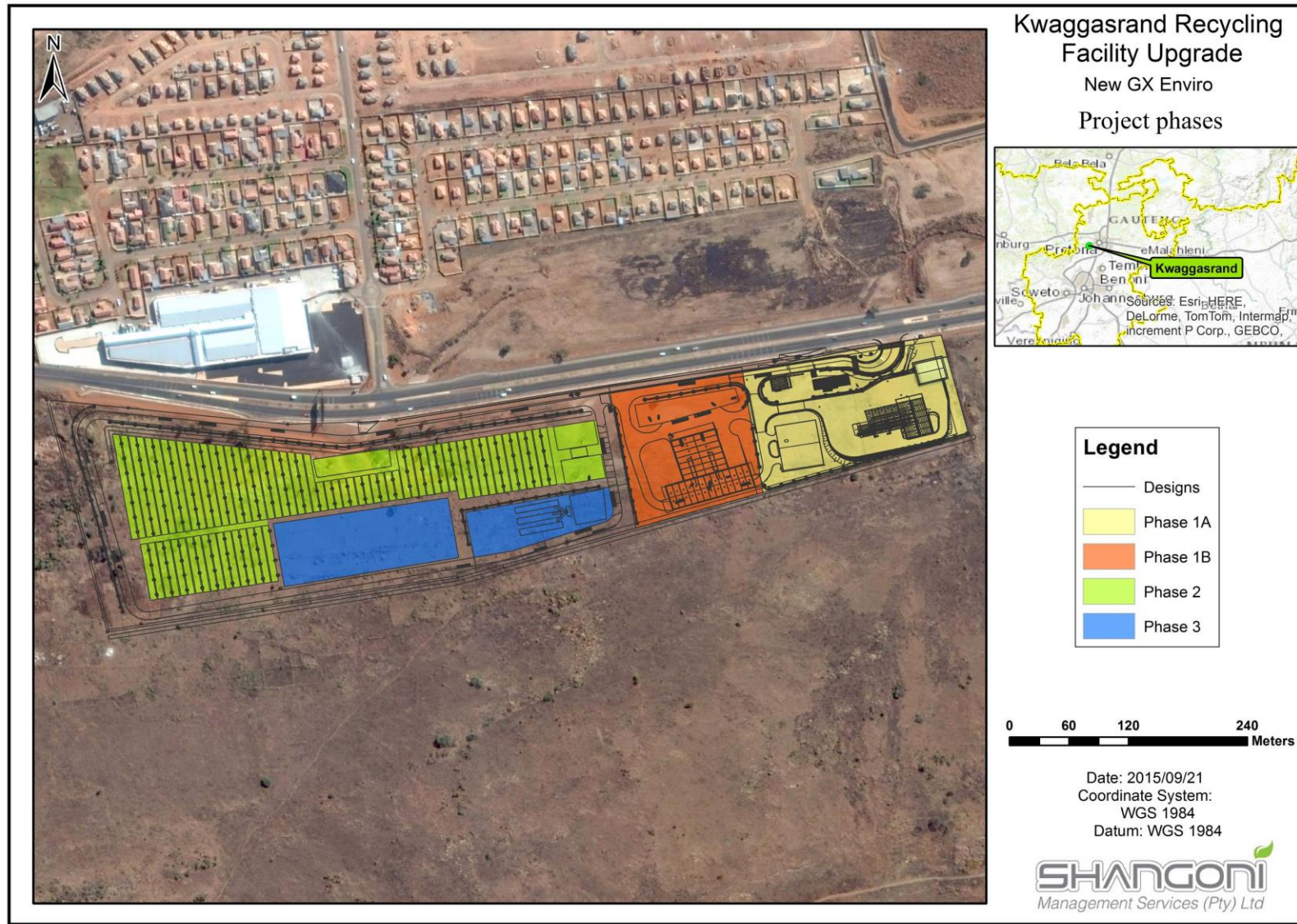


Figure 2: Project Phases

Phase 1B of the project (1.65ha): The construction of new infrastructure in support of the existing recycling facility in order to optimise and increase the throughput capacity of the facility. This phase entails the establishment of a Waste Transfer Station and the throughput capacity of the recycling facility will be increased to $\pm 783.57 - 912.9$ tons per day of dry and wet waste that hasn't been recycled by households and businesses. The infrastructure will include, for example, a docking/parking area for the dumping of waste and refuse loads, a waste and refuse storage area, parking areas, a staff canteen, offices, an education centre and ablution facilities. Designs for the upgrade of the recycling facility have been finalised and are included in Section 1.5.3 and attached under Appendix C of this report.

Wet waste will be managed in two ways at the facility. In the first process, the wet waste will be separated from the dry waste and can then be channelled towards one of two processes. The wet waste will either be loaded into open top bins and taken to a licensed, off-site bio-digester/gasifier for further processing, or it will be air dried onsite to produce Refuse Derived Fuel ('RDF'). The applicant is also proposing to install a bio-digester/gasifier at the Kwaggasrand Recycling Facility, but this technology requires authorisation from the National Department of Environmental Affairs. Once such authorisation has been received, the wet waste will be fed into the onsite bio-digester/gasifier. A flow diagram of this process is given below.

In the second process, the recyclable fractions of the wet waste will be removed and the remaining waste will be baled. The bales will then either be wrapped in plastic or loaded into static compactor bins and taken off site to landfill sites or waste-to-energy facilities. Wastewater from this process will be treated and released into the municipal sewage system. A flow diagram of this process is also given below.



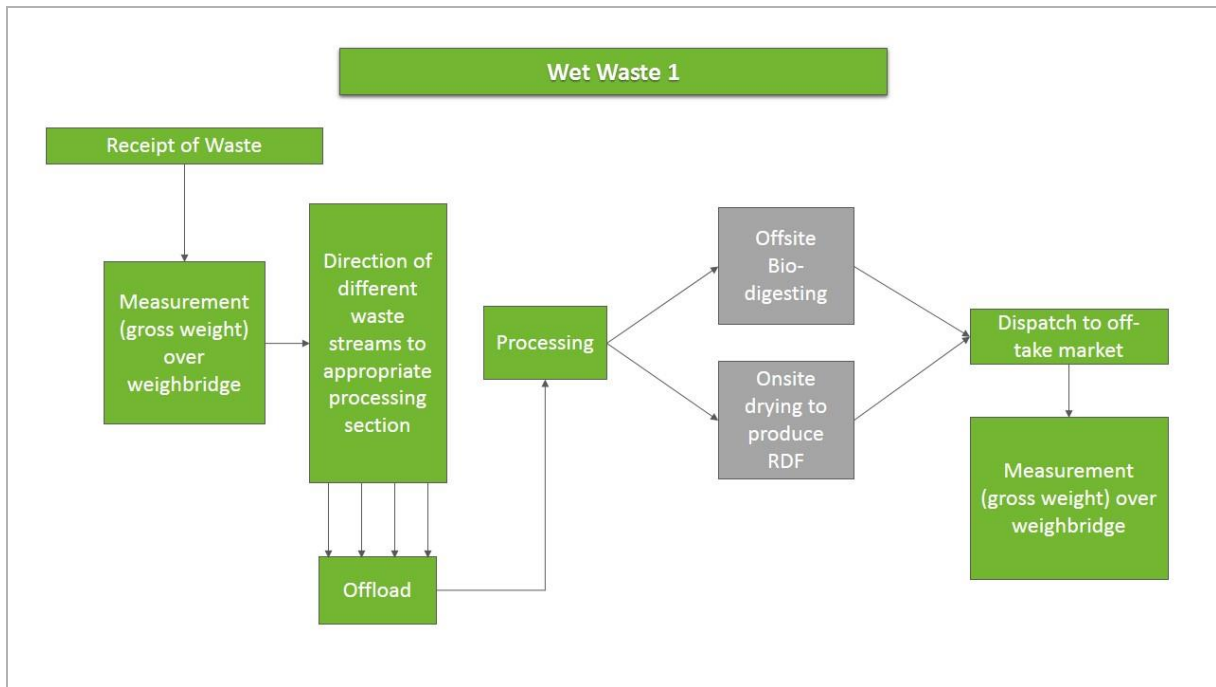


Figure 3: Flow diagram for wet waste (1) – Bio-digester/gasifier/air drying

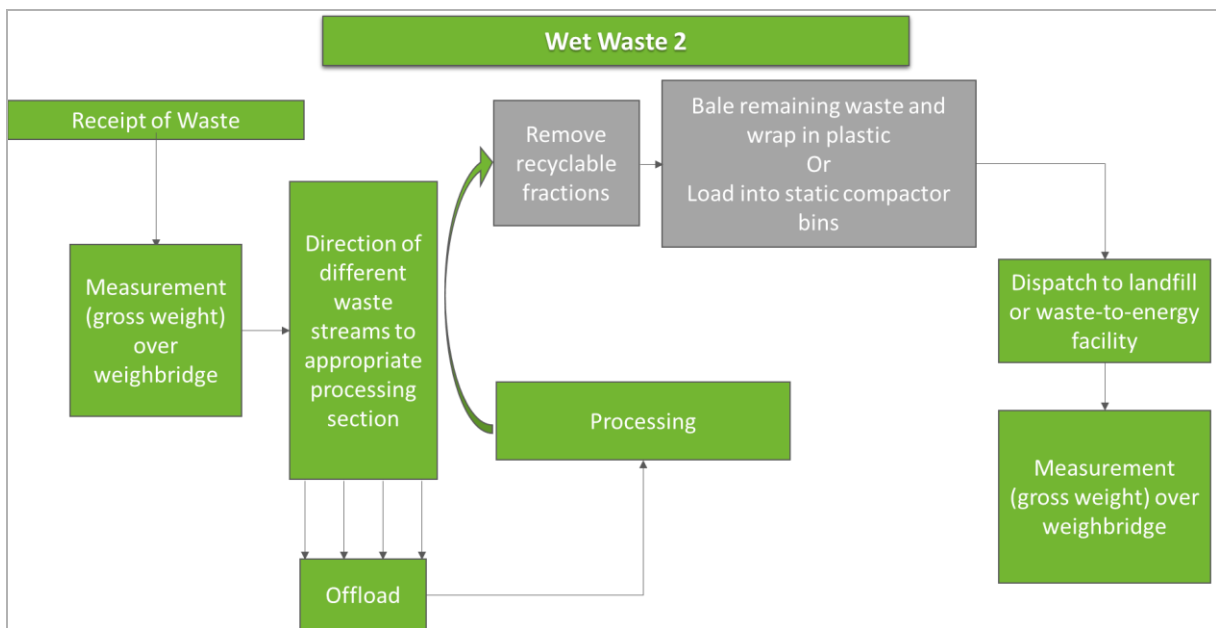


Figure 4: Flow diagram for wet waste (2) - Wet waste baler

Phase 1B will only make provision for the recycling of the new, “wet waste” waste stream. This phase will not increase the capacity or change the nature of waste that will be recycled as part of Phase 1A of the project (MRF).

A Waste Storage Facility will also be constructed for the storage of baled and plastic wrapped general waste from the Waste Transfer Station. As more than 100m³ of general waste will be stored at the facility, the facility will be registered on the Gauteng Waste Information System and will comply with the National Norms and Standards for the Storage of Waste (GN. 926 of 29 November 2013).



Phase 2 of the project (7.12ha):

Green waste: A composting facility will be set up on open land west of the above mentioned recycling building. At the composting facility, green waste such as garden refuse and sports field- and park-maintenance waste, will be stockpiled and fed into a shredding or mulching apparatus where after the bulk of the shredded/mulched material will enter a windrow composting process. Some mulched material will be stockpiled and sold off to the landscaping and/or rehabilitation industry without being subjected to further composting. Compost windrows will repeatedly be turned and moistened and the resultant compost will be sold. Seepage water from the composting windrows will be collected in a leachate collection pond for re-use to moisten the windrows. A flow diagram of this process is given below.

Phase 2 will also include the establishment of a storage area for baled and plastic wrapped refuse.

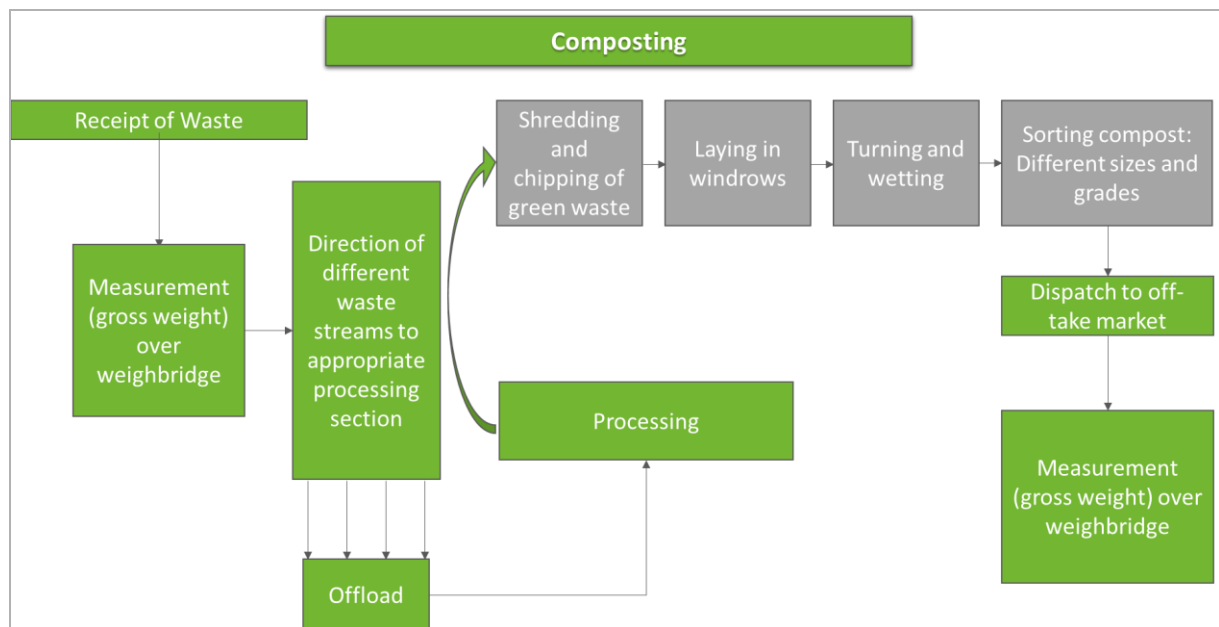


Figure 5: Flow diagram for the composting facility

Phase 3 of the project (1.87ha): A building rubble crushing plant will be erected on open land, also to the west of the above mentioned recycling building. Here building rubble will be stockpiled and crushed in a crushing plant. Crushed material will be distributed for foundation and filling material for local construction projects. A flow diagram of this process is given below.



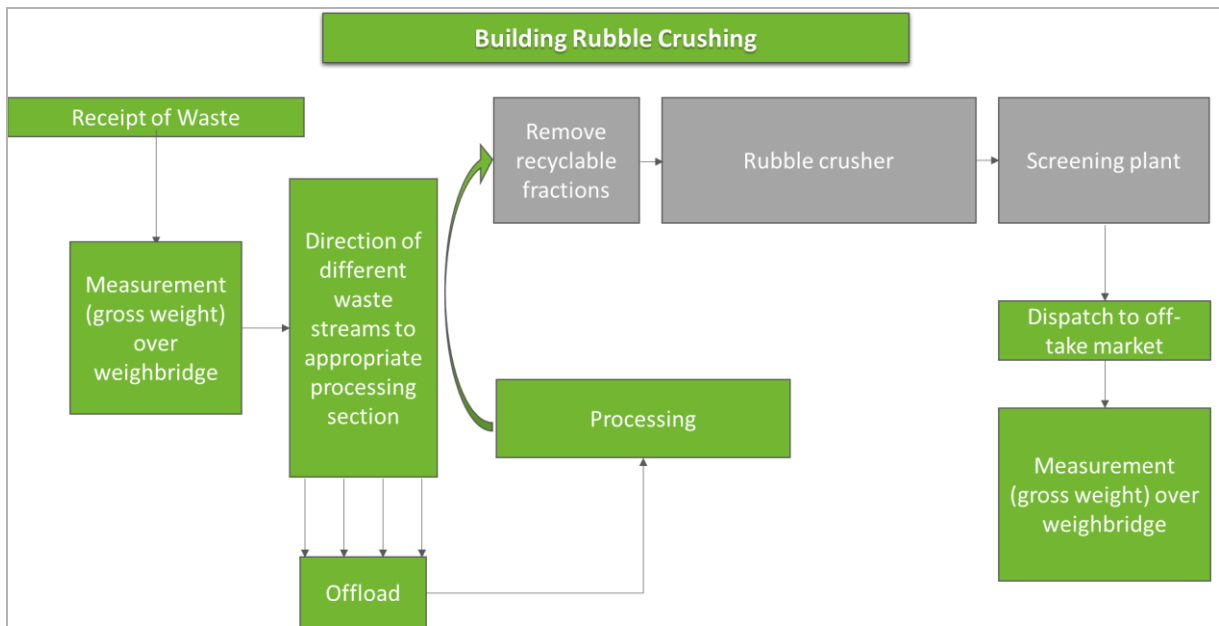


Figure 6: Flow diagram for the building rubble crusher

At a Waste Tyre Crumbing Facility, waste tyres will be de-beaded, cut, shredded, screened and grinded into rubber crumbs. The rubber crumbs will leave the site for re-use elsewhere such as, for example, in road tarmac, rubber products, agriculture and reclaimed rubber processes. A flow diagram of this process is given below.

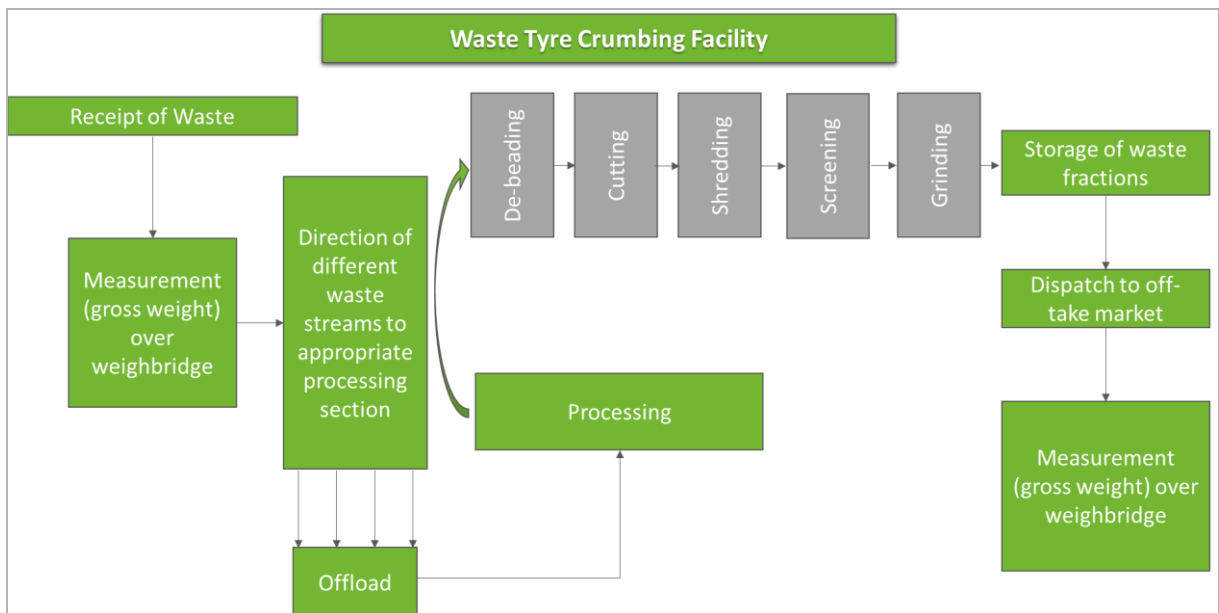


Figure 7: Flow diagram for the Waste Tyre Crumbing Facility

It is expected that the recycling facility will have the following operational times:



Table 4: Expected operational times for the facility

PERIOD	FROM	UNTIL
Weekdays	07:00	00:00
Saturdays	07:00	00:00
Sunday	07:00	00:00
Public holidays	07:00	00:00

The following listed activities in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) are being applied for:

Table 5: Listed activities in terms of GN. No R 921, dated 2013 under NEM: WA, 2008

Number and date of the relevant notice	Category	Activity No	Description
GN. No 921 of 29 November 2013	Category A	2	The sorting, shredding, grinding, crushing, screening or bailing of general waste at the facility that has an operational area in excess of 1 000m ² .
			The operational area for sorting, shredding, grinding, crushing, screening and baling of waste will be approximately 128 100m ² . The following will occur at the facility: <ul style="list-style-type: none"> • Sorting, screening and baling of cardboard, paper, plastic and cans. • Sorting, crushing and screening of glass. • Shredding and composting of green waste. • Sorting, screening, baling, drying and plastic wrapping of wet waste. • Crushing and screening of building rubble. • Waste tyre de-beading, cutting, shredding, screening and grinding.
GN. No 921 of 29 November 2013	Category A	3	The recycling of general waste at a facility that has an operational area in excess of 500m ² , excluding recycling that takes place as an integral part of an internal manufacturing process within the same premises.
			General waste will be recycled at the Kwaggasrand Recycling Facility. The facility has an operational area of approximately 128 100m ² . The following waste streams will be recycled: <ul style="list-style-type: none"> • Cardboard • Paper • Plastic



Number and date of the relevant notice	Category	Activity No	Description
			<ul style="list-style-type: none"> • Cans • Glass • Green waste • Wet waste • Building rubble • Waste tyres <p>Cardboard, paper, plastic, cans and glass will pass through a Materials Recovery Facility (MRF) where the waste will be sorted, screened and baled or crushed. The waste will then leave the site for re-use as raw material for manufacturing processes or for export.</p> <p>Green waste will be shredded and composted at the composting facility. The resulting compost will be sold.</p> <p>Wet waste will either be loaded into bins and taken to an off-site bio-digester/gasifier for further processing; air dried onsite to produce Refuse Derived Fuel (RDF); or baled and plastic wrapped. The baled and plastic wrapped wet waste will leave the site for use in waste-to-energy facilities.</p> <p>Waste tyres will be de-beaded, cut, shredded, screened and grinded.</p>
GN. No 921 of 29 November 2013	Category A	12	<p>The construction of a facility for a waste management activity listed in Category A of this Schedule (not isolation to associated waste management activity).</p> <p>Construction activities associated with the waste transfer station, green waste composting facility, building rubble recycling facility (building rubble crushing) and waste tyre crumbing facility. The general waste recycling building is existing and operational.</p>
GN. No 921 of 29 November	Category B	6	The treatment of general waste in excess of 100 tons per day calculated as a monthly average, using any form of treatment.



Number and date of the relevant notice	Category	Activity No	Description
2013			<p>1 521.5 tons of general waste will be treated (physical, biological and/or chemical treatment) at the Kwaggasrand Recycling Facility per day. The following waste streams will be treated:</p> <ul style="list-style-type: none"> • Cardboard • Paper • Plastic • Cans • Glass • Green waste • Wet waste • Building rubble • Waste tyres <p>Cardboard, paper, plastic, cans and glass will pass through a Materials Recovery Facility (MRF) where the waste will be sorted, screened, baled or crushed. The waste will then leave the site for re-use as raw materials or for export.</p> <p>Green waste will be shredded and composted at the composting facility. The resulting compost will be sold.</p> <p>Wet waste will either be loaded into bins and taken to an off-site bio-digester/gasifier for further processing; air dried onsite to produce Refuse Derived Fuel (RDF); or baled and plastic wrapped. The baled and plastic wrapped wet waste will leave the site for use in waste-to-energy facilities.</p> <p>Waste tyres will be de-beaded, cut, shredded, screened and grinded.</p>
GN. No 921 of 29 November 2013	Category B	10	<p>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).</p> <p>Construction activities associated with recycling of general waste in excess of the current throughput capacities. This includes, for example, the construction of a Docking/Parking area for disposal/dumping of waste and refuse loads, the construction of a Waste and refuse storage area and the construction of the staff canteen and ablution facilities.</p>



1.5.1 Proposed locality

The proposed site for the recycling facility upgrade project is located on Portion 463 of the farm Pretoria Town and Townlands 351 JR in Pretoria, Gauteng Province. The property is 12.8165 hectares in extent.

The proposed site is situated within the City of Tshwane Metropolitan Local Municipalities' jurisdiction.

Table 6: Administrative and water management boundaries

Province	Gauteng
District Municipality	City of Tshwane Metropolitan Municipality (CTMM)
Local Municipality	City of Tshwane Metropolitan Municipality (CTMM)
Ward	3, 51 and 61
Department of Water and Sanitation (DWS) Local Office	Pretoria
Department of Agriculture and Rural Development Local Office	Johannesburg
Catchment Zone	A23D
Water Management Area	Crocodile (West) and Marico

Table 7: Direction and distance to the nearest areas

Closest areas	Distance from site	Direction from site
Atteridgeville	Less than 1km	North, North-west and West
Laudium	Less than 1km	South

The site locality map is given below as Figure 8 and is attached in Appendix A. Site photographs are also provided below and attached in Appendix B.



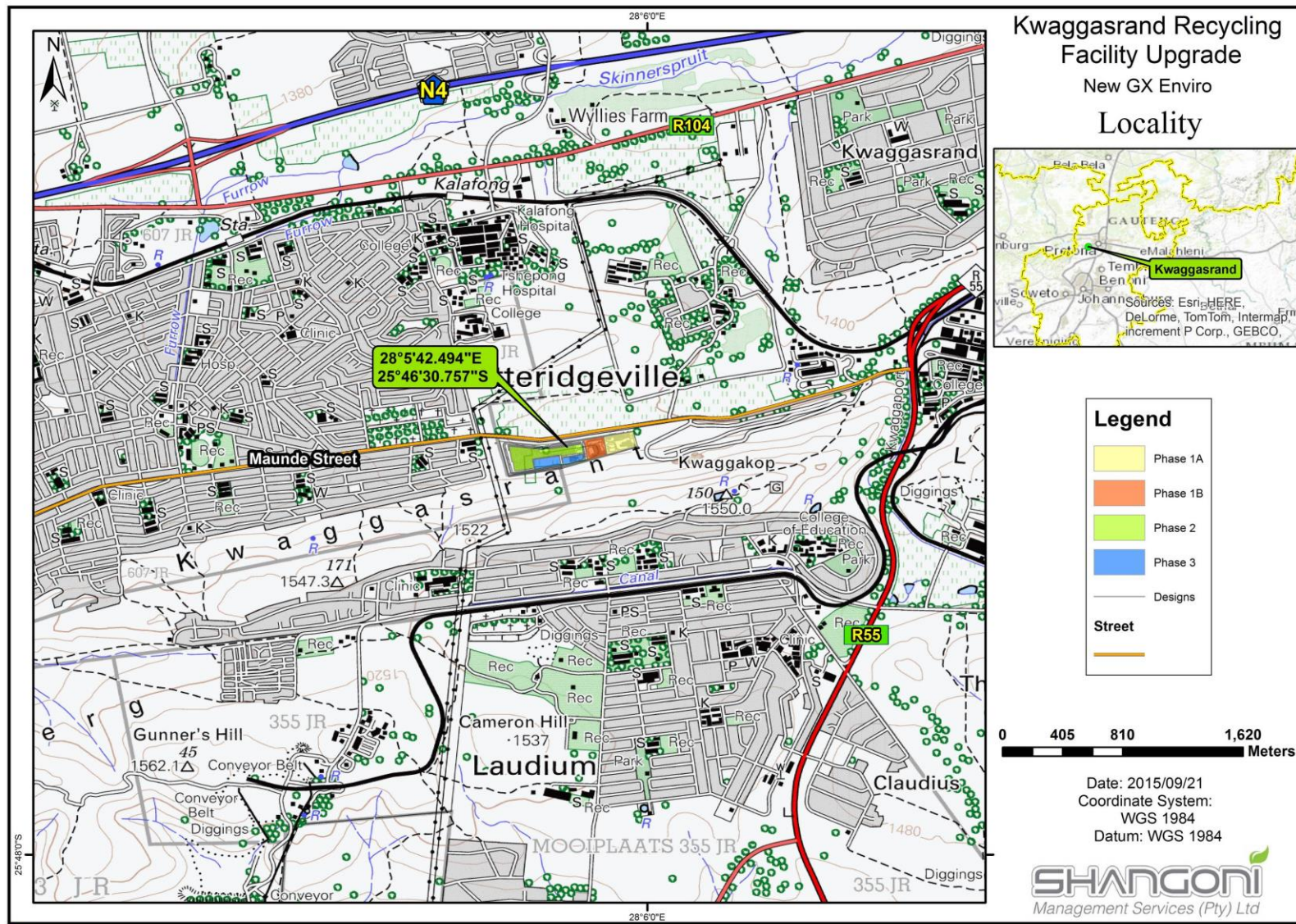


Figure 8: Locality of the site



a



b



c



d





e



f



g



h





i



j



k



l





m

Figure 9(a-m): Site photographs



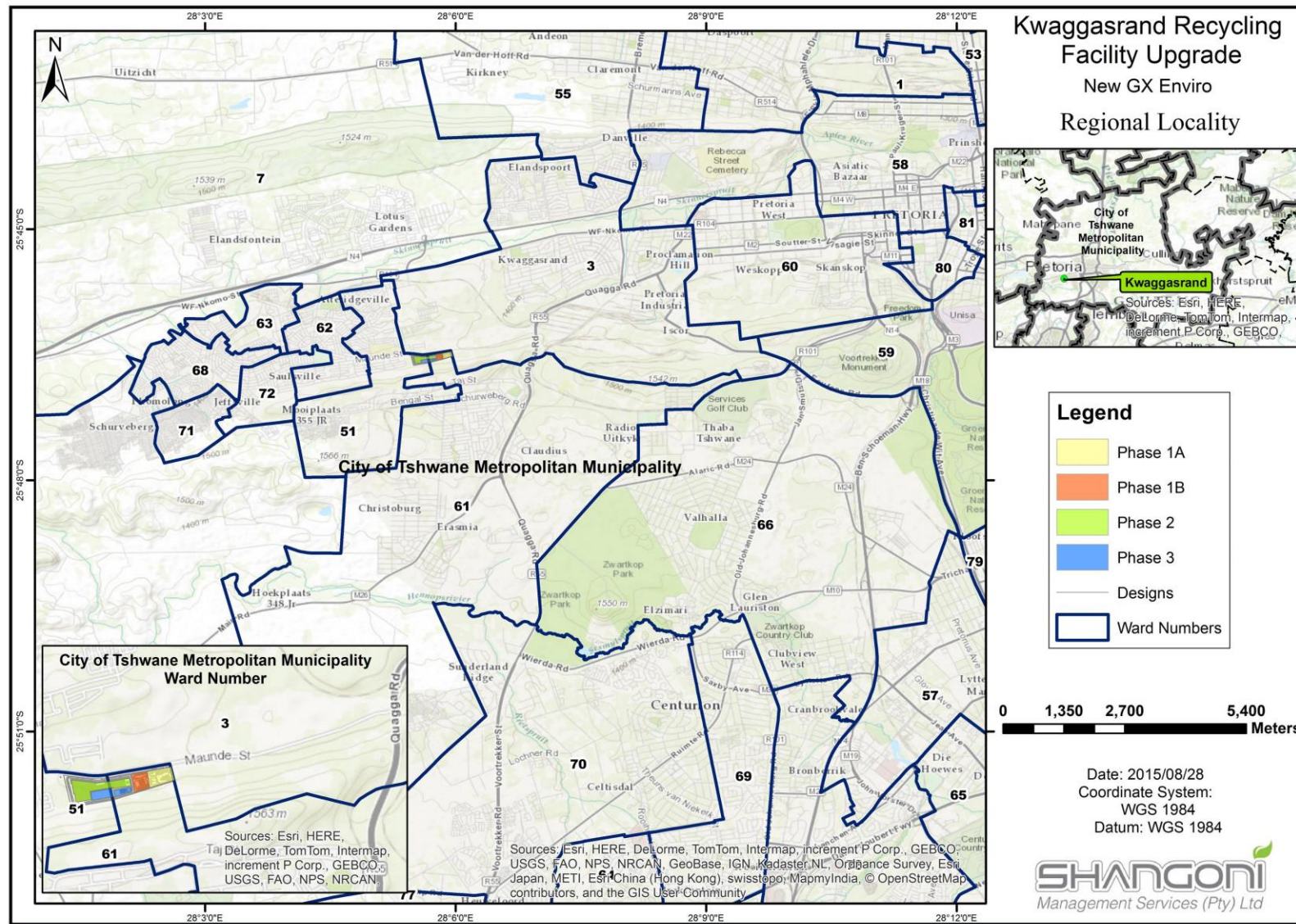


Figure 10: Regional locality of the site

1.5.2 Land tenure and use of immediately adjacent land

The predominant land uses in the vicinity of the project property are shown in Figure 19 and include urban built-up areas, degraded areas and open spaces (natural areas). The Kwaggasrand landfill site is situated adjacent and to the east of the project property.

The adjacent land owners of the project property are listed in the table below and shown in Figure 11. Refer also to Part 4 for more detail regarding the Public Participation Process.

Table 8: Surface rights holders of properties adjacent to the proposed site

Farm Name	Title deed	Owner
Portion 206 of the farm Pretoria Town and Townlands 351 JR	G225/956	City of Tshwane Metropolitan Municipality
Portion 293 of the farm Pretoria Town and Townlands 351 JR	T45099/981	Lifetime Township Developers (Pty) Ltd (JT Group)
Portion 294 of the farm Pretoria Town and Townlands 351 JR	T45099/981	Lifetime Township Developers (Pty) Ltd (JT Group)
Portion 6 of the farm Pretoria Town and Townlands 351 JR	G294/908	City of Tshwane Metropolitan Municipality
Remaining extent of the farm Atteridgeville 607 JR	T69319/1987	City of Tshwane Metropolitan Municipality
16251/Erf 353 JR (Atteridgeville Properties)		Safari Retail/Investments



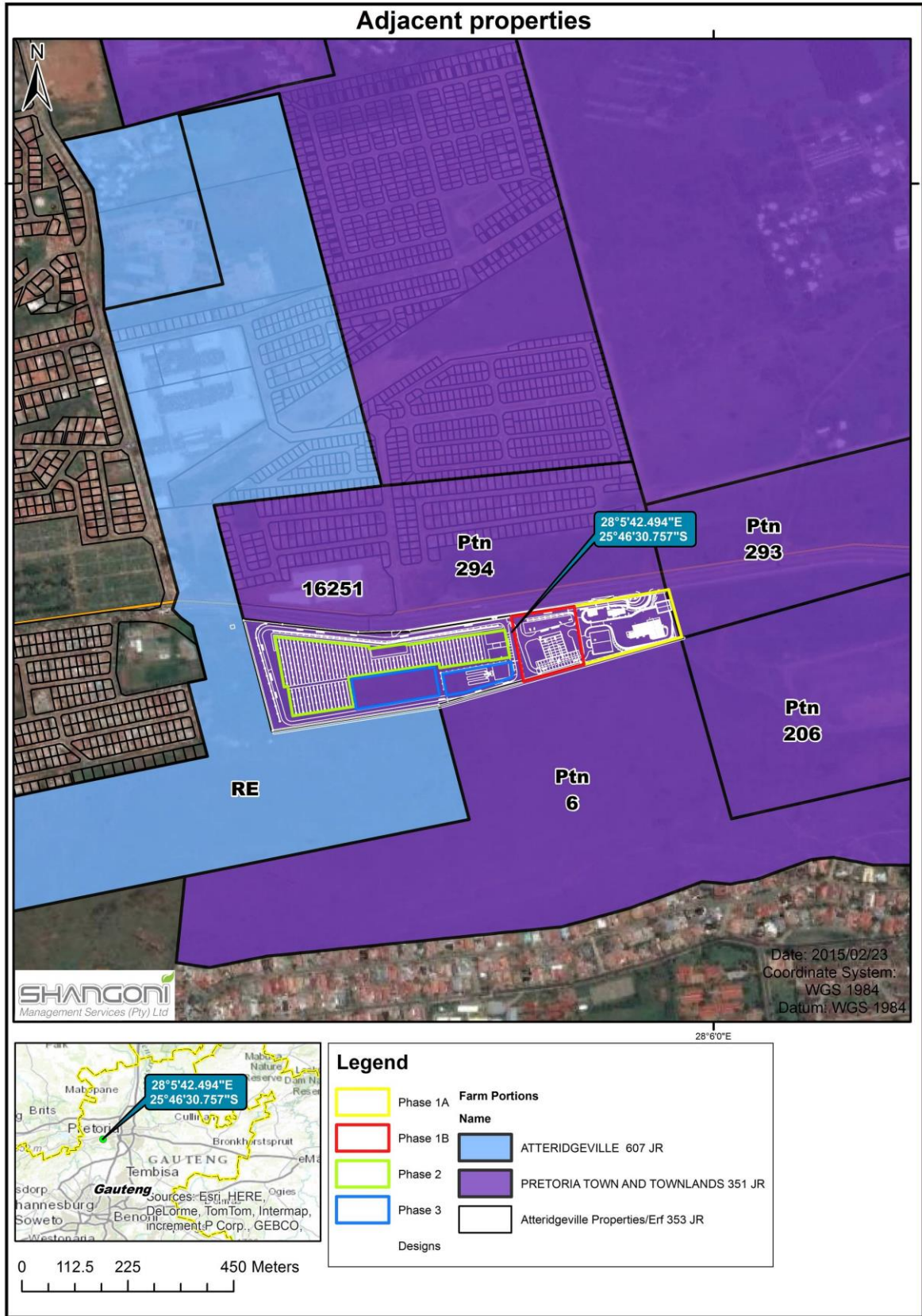


Figure 11: Properties adjacent to the proposed site



1.5.3 Design

The engineering layout drawing for the proposed project has been finalised for all the project phases. The layout drawing is given in the figure below and is also attached Under Appendix C. The Landscape Development Plans will be finalised as part of the Building Plan Approval process at the City of Tshwane Metropolitan Municipality. An example of a Landscape Development Plan (the plan compiled for Phase 1A of the project) is also attached under Appendix C.



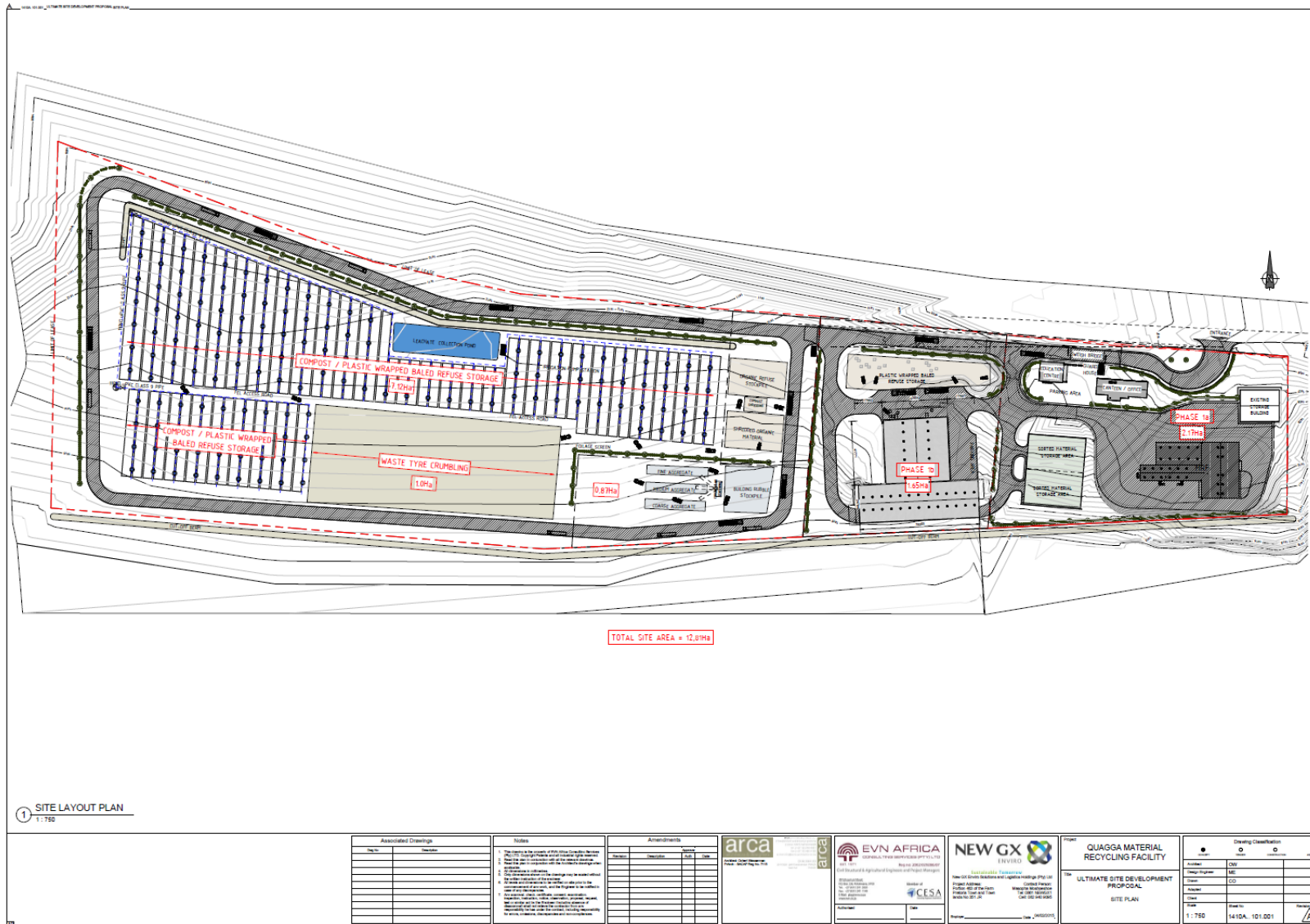


Figure 12: Engineering Layout Drawing



2. NATURE AND EXTENT OF THE ENVIRONMENT AFFECTED BY ACTIVITY

2.1 Geology

According to Mucina & Rutherford (2006), the general geology underlying the Gauteng Shale Mountain Bushveld vegetation type (the vegetation type of the project site) is dominated by coarse clastic sediments and shale, as well as extensive andesite from the Pretoria Group (Transvaal Supergroup). These are all sedimentary rocks. A part of the area is also underlain by Malmani dolomites of the Chuniespoort Group (also Transvaal Supergroup) (Mucina & Rutherford, 2006). The general geology of the site and surrounding areas are shown in the figure below.

A Geotechnical Investigation was carried out by Johann vd Merwe (Pty) Ltd in 2015. The following is a summary of the findings of the investigation, specifically relating to Phases 1B, 2 and 3 of the proposed project. An investigation was also conducted for the MRF (Phase 1A) and the report is also attached under Appendix E for information purposes.

Methodology

The investigation consisted of the profiling and sampling of twelve (12) test pits by Johann vd Merwe (a registered professional engineering geologist).

Findings

The project property is located on transported soils and imported fill that are presumably underlain at depth by sediments belonging to the Pretoria and Chuniespoort Groups, Transvaal Supergroup. The property has been apportioned into three prominent soil zones (Soil Zones A, B and C), as shown in the Geological Map attached under Appendix E.

Soil Zone A

This soil zone covers the higher-lying southern portion of the property and consists of a prominent horizon of talus material consisting of abundant coarse chert gravels, cobbles and small boulders, clast supported in a matrix of reddish brown, sandy silt. This horizon has an overall consistency of loose and extends down to more than 2.5m below the surface. Isolated outcrops of hard rock chert are present in this zone.

Soil Zone B

This soil zone covers part of the northern portion of the property and consists of a prominent horizon of dark red, loose to very loose, clayey fine sand that extends to more than 3.0m below the surface.



Soil Zone C

This soil zone covers the central and entire western portion of the property and is characterised by a large open excavation where the dark red, clayey sand from Zone “B” has been removed, resulting in a large 3m deep excavation that has been partly backfilled with rubble. The central part of this zone consists of large stockpiles of gravelly soil derived from the construction site in the eastern part of the property (van der Merwe, 2015).



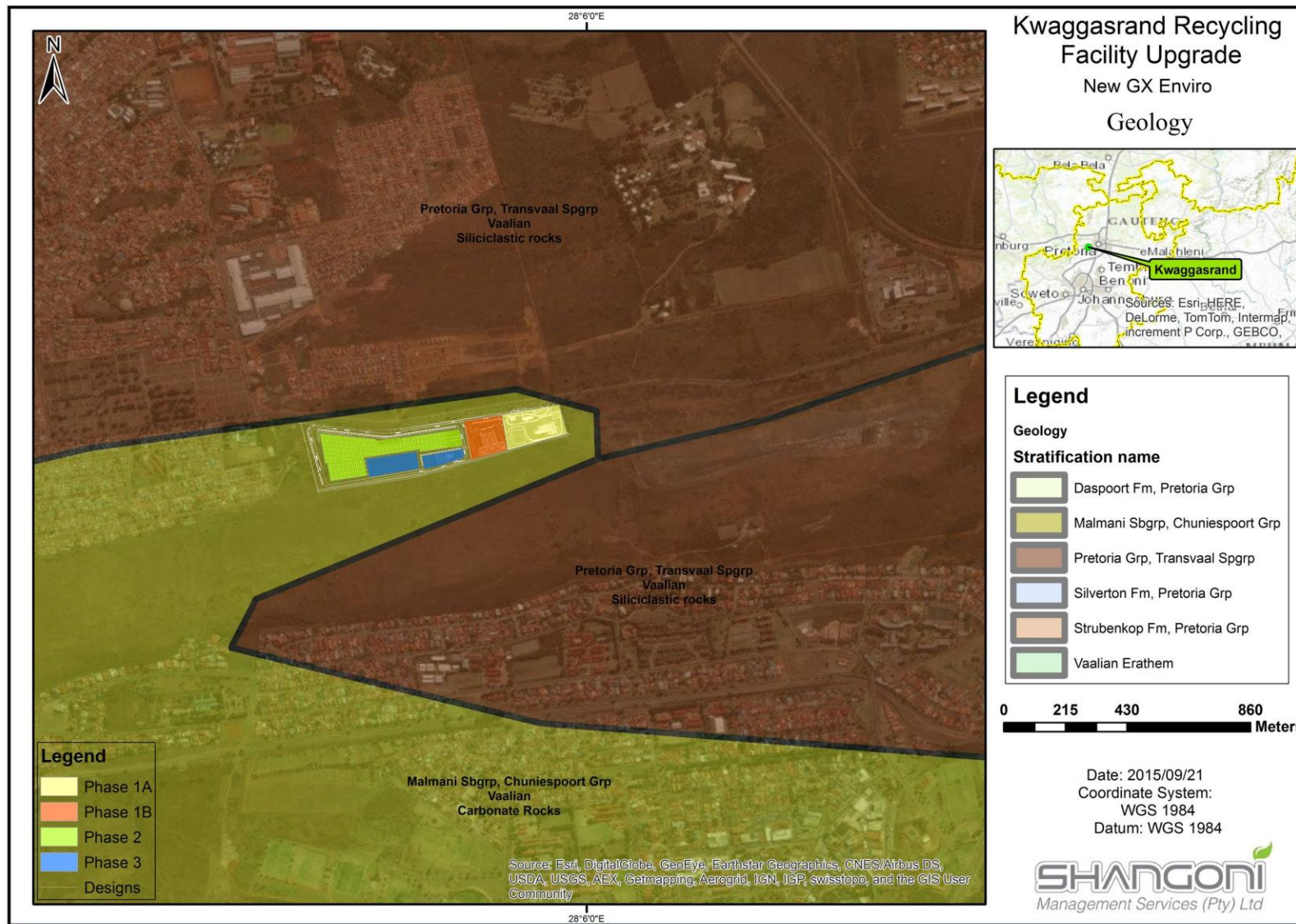


Figure 13: Geology at the site

2.2 Regional climate

2.2.1 Rainfall

The site is located within a summer rainfall area with very dry winters. Frost occurrence is frequent in the winter. According to the AGIS Comprehensive Atlas (2007), the mean annual rainfall at the site area is 601-800mm per annum. The figure below shows the long-term mean annual rainfall for the study area.

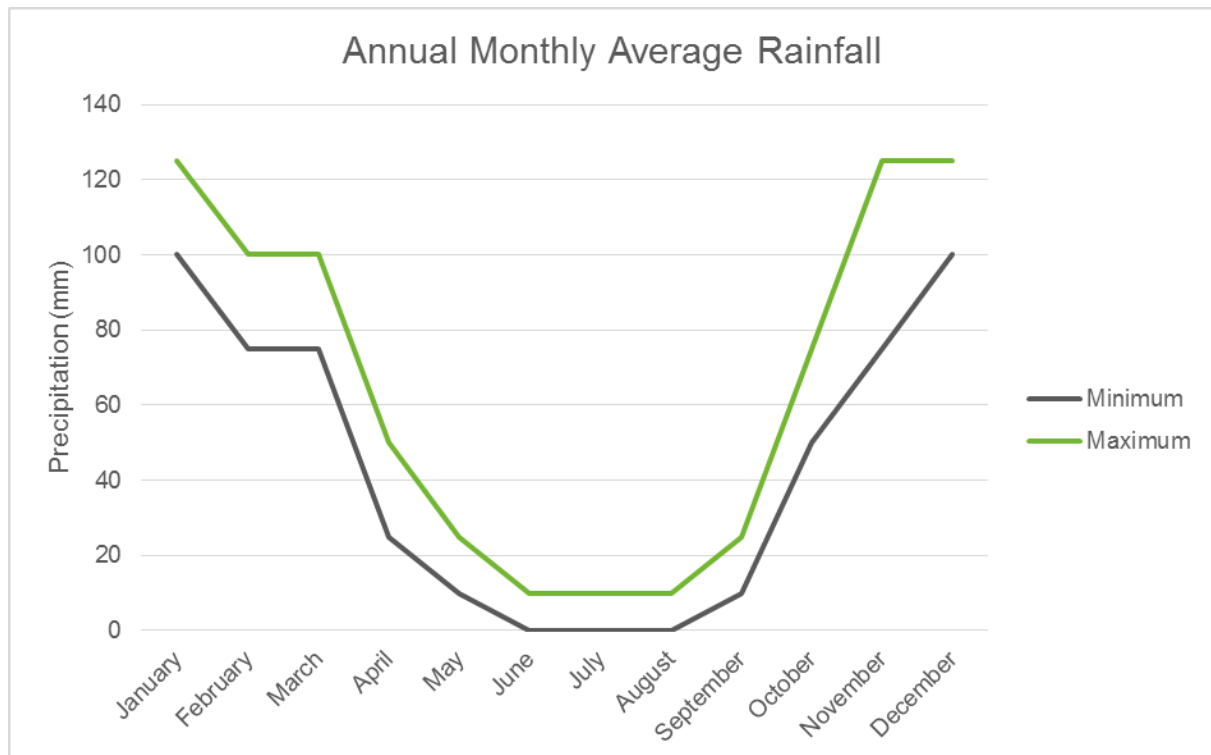


Figure 14: Annual monthly average rainfall at the site

2.2.2 Temperature

The maximum mean annual temperature for the site is between 25°C and 27°C and the minimum mean annual temperature for the site area is between -1°C and 4°C (AGIS, 2007). The figure below shows the annual monthly average temperature at the site for 2013.



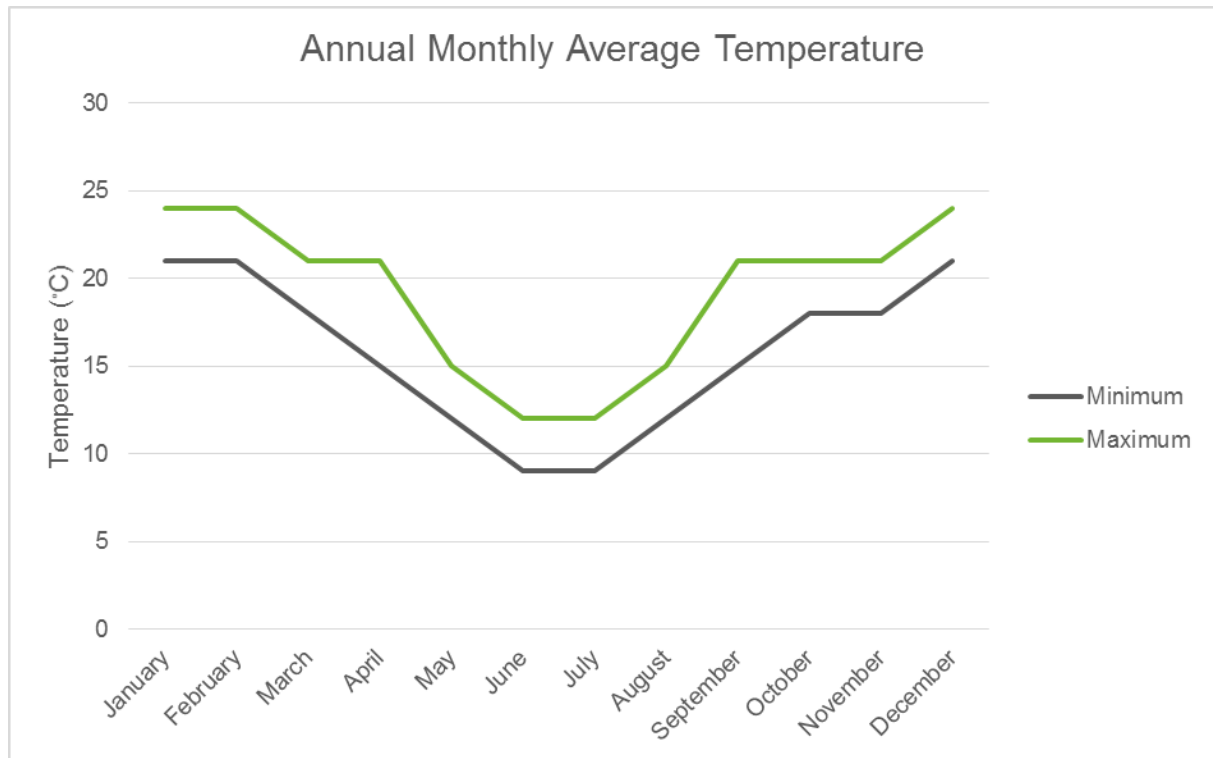


Figure 15: Annual monthly average temperature at the site

2.2.3 Evaporation

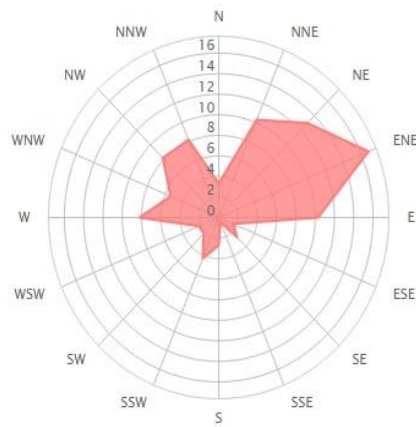
The Mean Annual Evaporation at the site ranges between 2 001 and 2 200 mm per annum (AGIS, 2007).

2.2.4 Wind

The figures below show the monthly wind directions at the site, compiled for the period December 2011 to March 2015 and obtained from www.windfinder.com. The predominant wind direction at the site is North-east (www.windfinder.com).

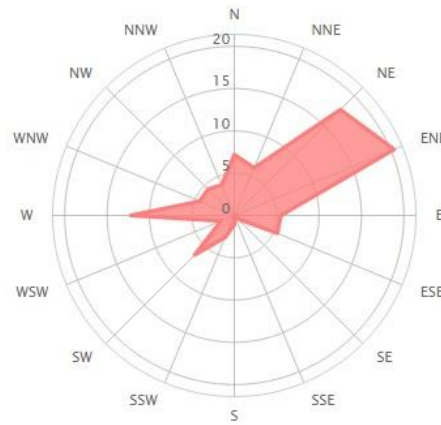


Wind direction distribution in (%)
January



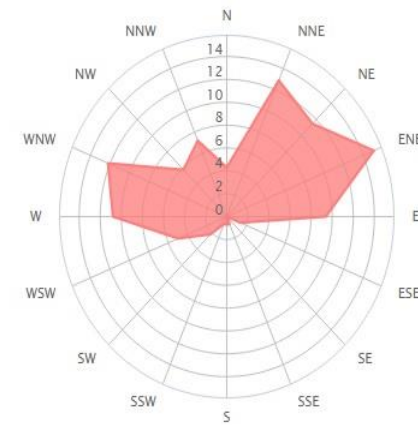
a

Wind direction distribution in (%)
February



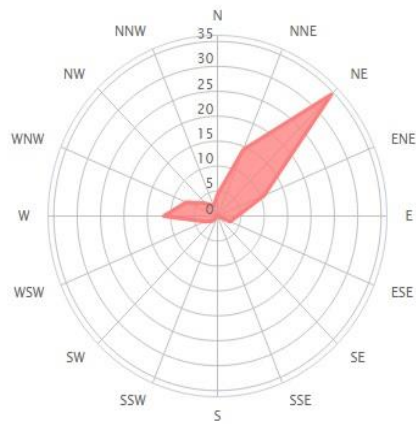
b

Wind direction distribution in (%)
March



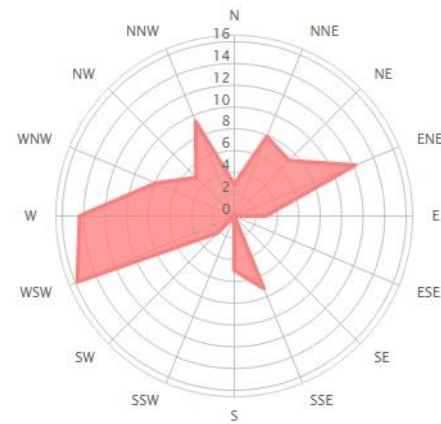
c

Wind direction distribution in (%)
April



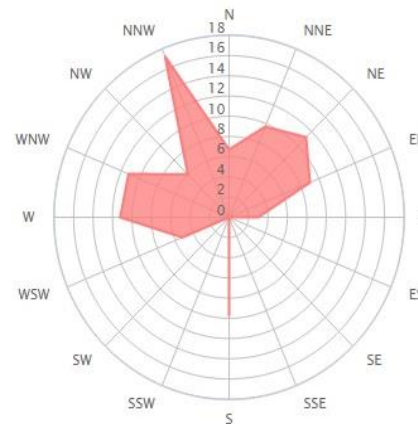
d

Wind direction distribution in (%)
May



e

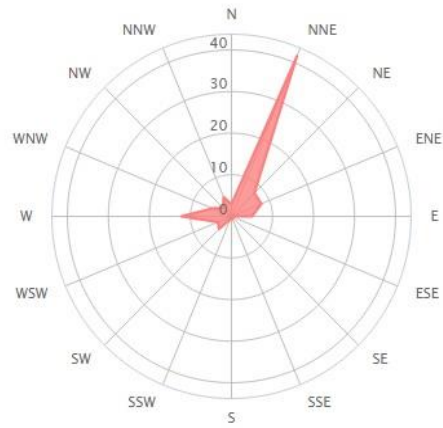
Wind direction distribution in (%)
June



f

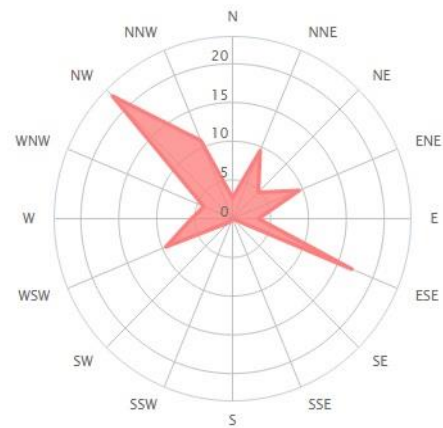


Wind direction distribution in (%)
July



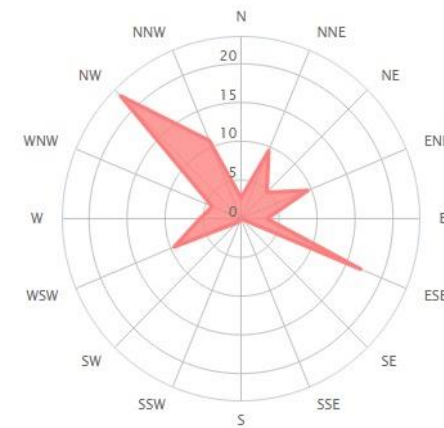
g

Wind direction distribution in (%)
August



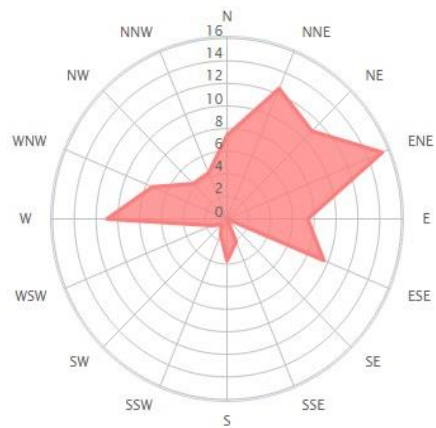
h

Wind direction distribution in (%)
August



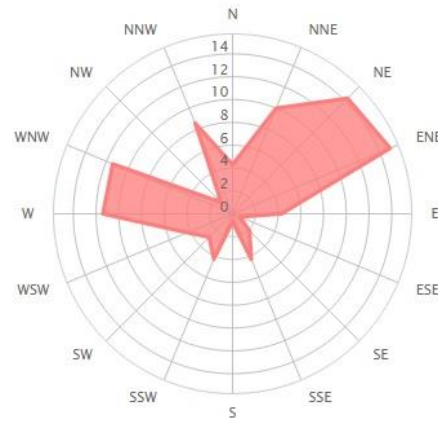
i

Wind direction distribution in (%)
October



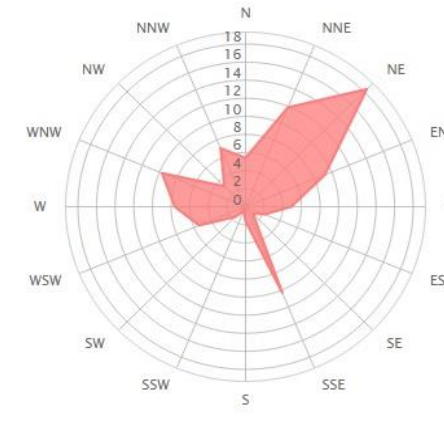
j

Wind direction distribution in (%)
November



k

Wind direction distribution in (%)
December



l

Figure 16: Wind roses showing the monthly wind direction at the site



2.3 Topography

According to Mucina and Rutherford (2006), areas covered by Gauteng Shale Mountain Bushveld vegetation type occur mainly on the ridge of Gatsrand, to the south of Carletonville, Westonaria and Lenasia, but also as a narrow band along the ridge that runs from a point between the Magaliesberg and Tarlton in the west, through Pelindaba, Sterkfontein and Atteridgeville to Klapperkop and the south-east of Pretoria in the east. The altitude of these areas range from 1 300 to 1 750 masl (metres above sea level) (Mucina & Rutherford, 2006).

The site slopes downwards from west to east, from an elevation of 1 430 masl to 1 410 masl. The topography of the site is shown in the figure below.



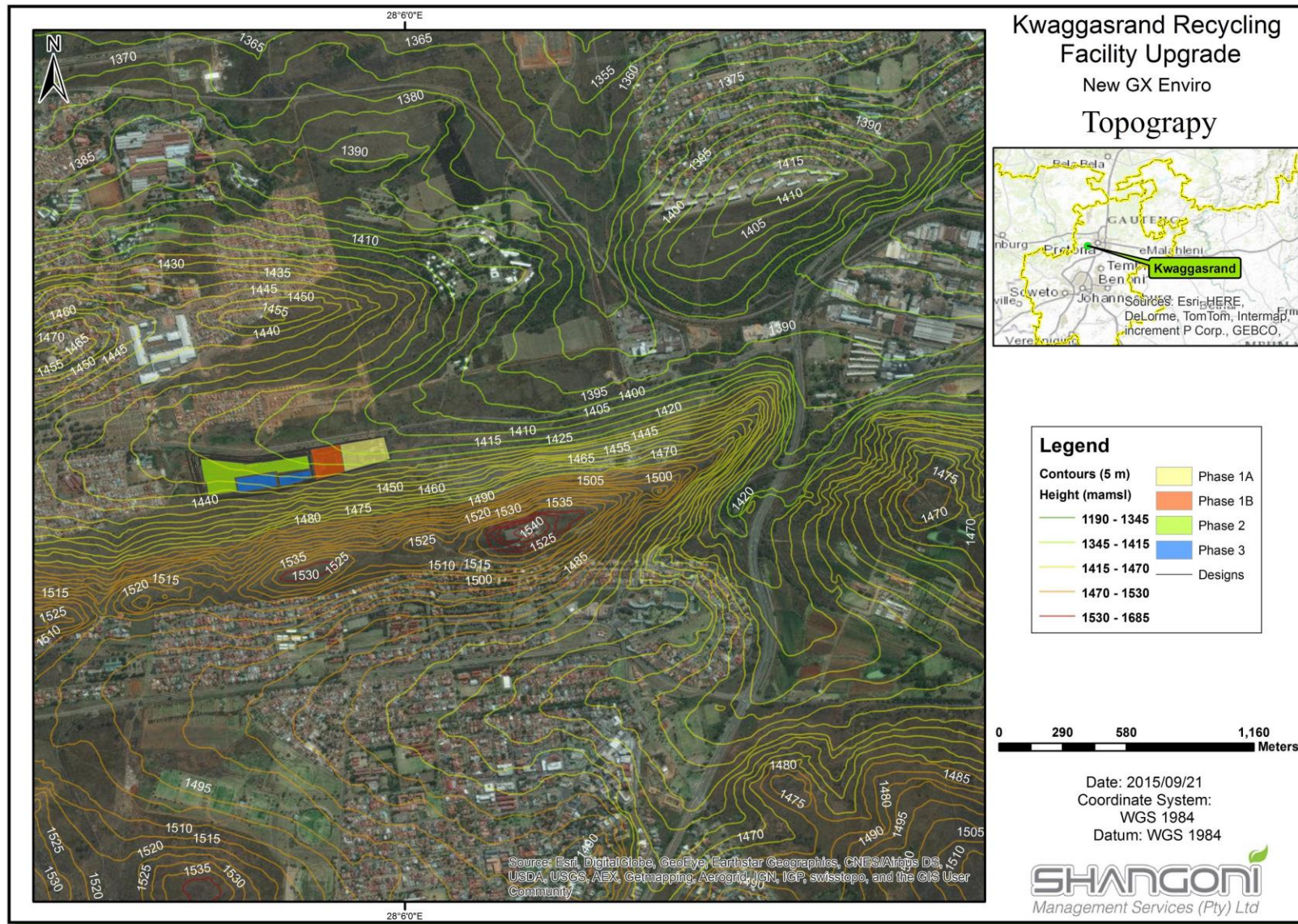


Figure 17: Topography of the site

2.4 Soils

In general, soils underlying Gauteng Shale Mountain Bushveld vegetation type, are mostly shallow Mispah, tending to be deeper at the foot of slopes (Mucina & Rutherford, 2006). The figure below shows that the site consists of S16 soils. Areas further north and south of the site consist of S17 and S2 soil types, respectively.

S16 soils are non-soil land classes and may be water-intake areas. There are restricted land use options for these soils.



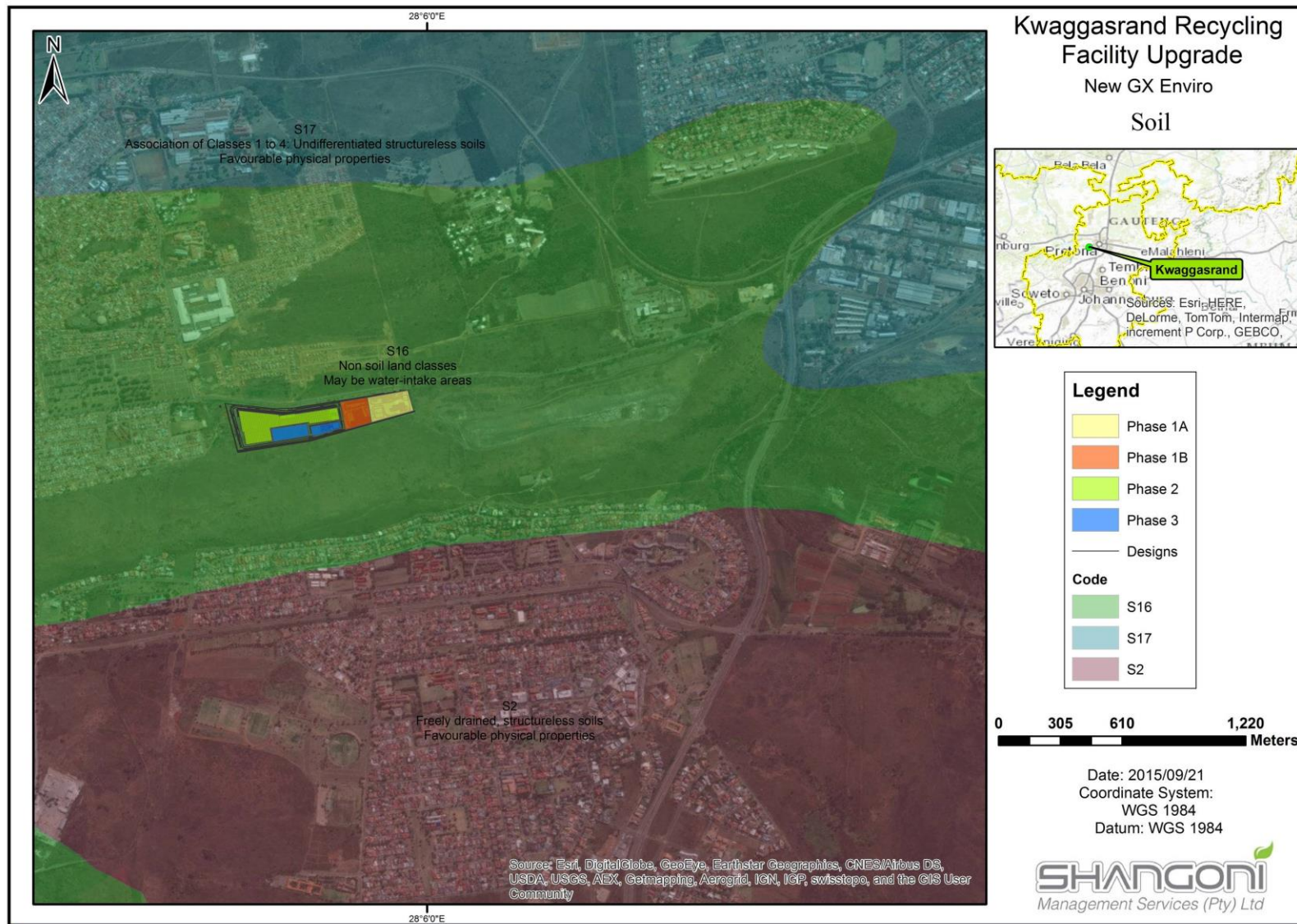


Figure 18: Soil types present at the site

2.5 Land use and land capability

The property is zoned as “Industrial 1” and there is an existing building (recycling facility) on the eastern part of the property where general waste has been sorted and recycled by hand. Currently, the manual sorting has been temporarily ceased at the facility, as of the 1st of December 2013. This is due to the fact that the adjacent Kwaggasrand landfill site has closed, as it had reached its disposal capacity. Phase 1A of the project, namely the installation of a Materials Recovery Facility (not part of this Waste Management Licence application) is currently being constructed onsite. A portion of the property was also used as a temporary off-site construction camp by the CTMM. Waste dumping, soil stripping (as part of the rehabilitation phase of the adjacent landfill site) and small scale farming also occurred in the past. The remainder of the property is vacant. The land uses of the areas adjacent to the project site are shown in the figure below.

According to the AGIS Comprehensive Atlas (2007) the land capability of the property is “Wilderness”. In the figure below, the land use of the property is “Natural”.



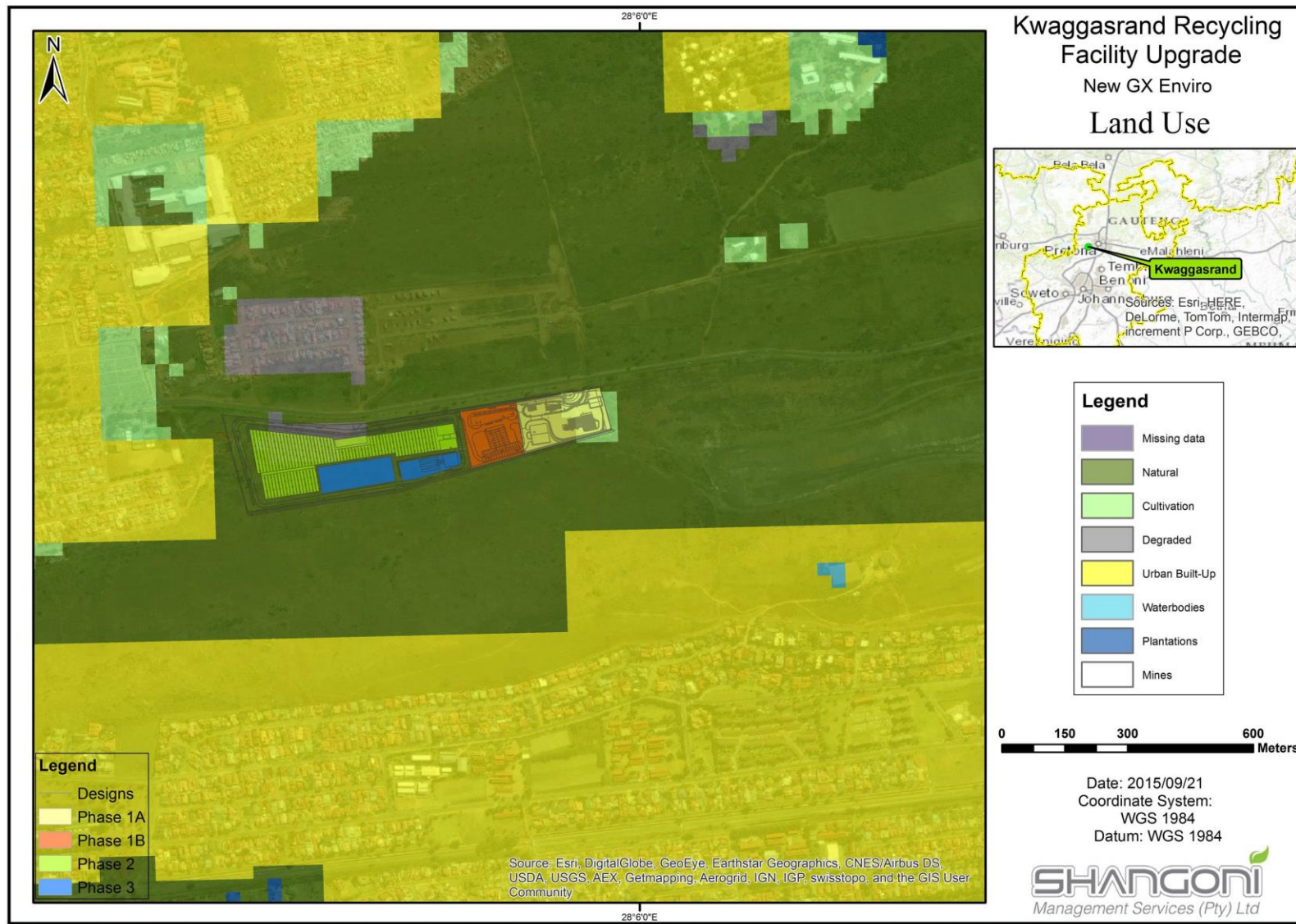


Figure 19: Land use of the site and surrounding areas

2.6 Vegetation

A Vegetation Assessment of the project property was conducted by Dimela Eco Consulting in April 2015. The following is an extract of the findings of their investigation.

The field assessment was undertaken on the 30th of April 2015. The project property, as well as 200m around the property boundary, was sampled and scanned for potentially sensitive vegetation and plant species. The field assessment was undertaken late in the season and some plants may have already been dormant or not in flower and could therefore have been overlooked. However, no frost had occurred as yet and due to good summer rains, much of the vegetation was still green or recognisable.

The project site is situated within the Savanna Biome of South Africa, specifically within the Central Bushveld Bioregion. This biome is the largest biome in southern Africa and is characterised by an herbaceous layer dominated by grasses and an upper layer of woody plants (shrubs and trees) (Mucina & Rutherford, 2006). The woody layer varies from open to closed, while canopy height may also vary. Summer rainfall, coupled with winter fire and regular grazing ensures that the grass layer remains dominant. In addition, the lack of high rainfall prevents the upper layer (trees) from dominating. However, where grazing intensity is high, and fire frequencies low, the tree layer could become increasingly dominant.

As per the recent Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006), the site lies within the Gauteng Shale Mountain Bushveld vegetation type (Figure 20). This vegetation type grows on low, broken ridges with a high surface rock cover (Mucina & Rutherford, 2006). This vegetation comprises short, open thicket with a variety of woody species (trees and shrubs), while the understory is dominated by grasses (low savanna). This vegetation type is considered as “Vulnerable” as more than 20% of its original extent is already transformed by cultivation, mining and urban development (Mucina & Rutherford, 2006).

The site is situated within the original extent of the Critically Endangered (CR) Witwatersberg Pretoria Mountain Bushveld ecosystem. This ecosystem is listed under criterion F that includes priority areas for meeting explicit biodiversity targets as defined in a systematic biodiversity plan. This implies that the area has a very high irreplaceability. Remaining natural areas within the extent of this ecosystem are therefore of high sensitivity and should not be developed.

2.6.1 Gauteng Conservation Plan

The Gauteng Conservation Plan (Version 3.3) (GDARD, 2011) classified areas on the basis of their contribution to reaching the conservation targets within the province. These areas are Critical Biodiversity Areas (CBA), classified as “Irreplaceable” (must be conserved) or “Important” to reach the conservation targets. Additionally, “Ecological Support Areas” (ESAs) were delineated to ensure



sustainability in the long term. The primary purpose of a map of Critical Biodiversity Areas and Ecological Support Areas is to guide decision-making about where best to locate/site proposed developments.

As per the Gauteng C-plan, the southern section of the site infringes on a small section classified as “Important”, as well as an Ecological Support Area (ESA) (Figure 21). The ‘Important’ area is of conservation concern due to the presence of primary vegetation and threatened (red listed) plant species (GDARD, 2011). ESAs 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. The Vegetation Assessment therefore needed to verify whether primary vegetation and threatened species, or suitable habitat for these species, were present on or south of the project site.

2.6.2 Ridges

Ridges are protected environments within the Gauteng province (GDACE, 2006). The term “ridge” refers to hills; koppies; mountains; kloofs and gorges; and/or a landscape type or topographic feature that is characterised by two or more of the following features: a crest, plateau, cliff or footslope. Conservation of ridges in Gauteng allows for the protection of habitat for significantly high numbers of species, ensuring their continued survival in a rapidly urbanising province. Ridges also form ecological corridors for the movement of species, especially in urbanised environments.

The southern portion of the project site is situated on a “Class 2 ridge” as defined by the Gauteng Ridge Policy (GDACE, 2006). Class 2 ridges are ridges of which 5-35% of their surface area has been transformed. As per the policy guideline, development activities and uses that have a high environmental impact will not be permitted, whereas low impact development activities, comprising of an ecological footprint of 5% or less of the property, may be permitted. In addition, low impact development activities on a ridge will not be supported where it is feasible to undertake the development on a portion of the property abutting the ridge. A 200m buffer zone of low impact development is required around Class 2 ridges.

2.6.3 Historical use of the property

Google Earth imagery indicates that much of the site has been historically used and disturbed. The eastern portion of the site, with the existing recycling building, has no natural vegetation remaining. A temporary construction camp was present to the west of the recycling building, as part of the upgrade of Maunde Street. The construction camp has since been removed. During the Field Assessment, the area was mostly bare or dominated by pioneer and weedy plant species, with some indigenous, pioneer trees present. West of the construction camp, the topsoil layer was removed and the soil historically mined, possibly for construction. Limited vegetation currently remains and the area was also used for dumping. A part of the western portion of the site was also historically divided into plots,



likely used for small scale farming and cattle pens. During the Field Assessment, these areas were overgrown with invasive and pioneer plant species and tall growing grasses such as *Eragrostis curvula*, *Hyparrhenia hirta* (common thatching grass) and *Heteropogon contortus*. The western boundary of the site was still being cultivated and also included a high number of alien invasive plant species.

2.6.4 Vegetation of the project site

The majority of the site was classified as “Transformed”. Remaining natural vegetation along the southern boundary of the site was found to be in a disturbed state and was classified as “Secondary and Disturbed Grassland”. Natural vegetation is present south of the project property. The vegetation of the project property and 200m around the property is shown visually on Figure 22. The following sections describe the “Transformed” and “Secondary and Disturbed Grassland” vegetation types in more detail.

Transformed vegetation

Transformed vegetation is regarded as vegetation that is different in species composition and/or structure to the reference state of untransformed rocky grassland or mountain bushveld. The removal or radical disturbance of natural vegetation and soil layers, trampling and soil compaction, cultivation or grazing and sand mining, transformed the vegetation and resulted in an abundance of pioneer and weedy plant species, including exotic and invasive plant species that colonised the transformed land. Transformation mostly results in a serious and permanent loss of vegetation structure and associated biodiversity. The vegetation comprised a high frequency of alien invasive plant species and bare compacted soils, not representative of Gauteng Shale Mountain Bushveld. The project phases (Phases 1B, 2 and 3) are situated within the Transformed and Secondary and Disturbed Grassland vegetation areas.

Phase 1A and 1B

This area comprised mainly bare soils with alien invasive plant species such as *Amaranthus hybridus* (common pigweed), *Flavernia bidentis* (smeltersbush) and *Schkuhria pinnata* (dwarf marigold), while the grass layer was dominated by the indigenous pioneer grass *Chloris virgata* (feather-top Chloris). Other indigenous grasses included the tall growing *Hyparrhenia hirta* (common thatching grass) and *Eragrostis curvula* (oulandgrass). Directly south of the fence, the vegetation was also transformed, likely by the building of the fence and edge effects from the landfill site. The invasive grass *Pennisetum setaceum* (fountain grass) was abundant.

Phase 2 and 3

This portion of the site was historically disturbed by the construction camp and related activities, as well as soil mining. At the time of the site assessment, the area comprised bare, compacted soils and vegetated areas dominated by alien and invasive plant species. Dominant herbaceous species included *Amaranthus hybridus* (common pigweed), *Flavernia bidentis* (smeltersbush), *Ipomoea*

purpurea (morning glory), *Tagetes minuta* (khaki weed) and the thorny *Tribulus terrestris* (dubbeltjie). Where soil was mined, the indigenous tree *Burkea africana* remained on islands of soil and some *Acacia tortillis* and *Acacia karoo* (sweet thorn) colonised the disturbed areas. Invasive tree and shrub species that occurred here and westward on the site include *Melia azedarach* (syringa), *Lantana camara* and *Ricinis communis* (castor oil).

The western portion of the site was dominated by dense stands of alien invasive plant species, with some scattered maize plots in between the dense growth. The vegetation was dominated by weeds such as *Tagetes minuta* (khaki bush), *Amaranthus hybridis*, *Solanum mauritianum* (bugweed), *S. sisymbriifolium* (wild tomatato) and *Xanthium strumarium* (large cocklebur). Indigenous species included pioneer species such as *Leonotus leonorus* (wild dagga) and tall growing grasses such as *Hyparrhenia hirta* (common thatching grass).

No plant species of conservation concern were recorded within the transformed vegetation and none are expected to occur.

Secondary and Disturbed Grassland

A narrow band of disturbed and secondary grassland was recorded along the southern boundary of the site. Edge effects from the historical onsite activities disturbed vegetation along the southern boundary, while the cultivation of the small plots, as well as areas where soil was mined, resulted in a secondary grassland.

Disturbed grassland was classified as grassland areas where human impacts and disturbances resulted in a degraded and disturbed vegetation with little ecological function and a limited likelihood for supporting plants species that are of conservation concern. Secondary grasslands develop where the original, primary (undisturbed) grassland vegetation is removed (e.g. by cultivation or other soil disturbances). After such disturbances stop, pioneer grassland species, as well as weedy pioneer plants, colonise the disturbed areas leading to a secondary grassland state with a much lower initial species diversity as opposed to the primary (climax) state prior to any disturbances. In the absence of further disturbances, the grassland could theoretically reach the primary state over time. However, primary grasslands are species rich ecosystems, which once disturbed, are difficult, if not impossible to restore.

The secondary and disturbed grassland supported a low species diversity and comprised patches dominated by the following grasses: *Heterpogon contortus* (spear grass), *Sporobulus africanus* (rats-tail dropseed), *Eragrostis curvula* (oulandsgras) and *Pogonarthria squarrosa* (herringbone grass). These are pioneer and sub-climax grasses that can colonise disturbed areas. Limited indigenous herbaceous species were present and included *Commelina africana* and *Lactuca inermis*. An abundance of the weedy *Tagetes minuta* (khaki weed) and the invasive shrub *Rumex cf usambarensis* grew in the secondary and disturbed grasslands.



Vegetation to the south of the project property

South of the site, the vegetation comprised natural rocky grassland with woody elements representative of Bakenveld (Acocks, 1966) and Gauteng Shale Mountain Bushveld (Mucina & Rutherford, 2006). Although the woody species were sparser than typical Gauteng Shale Mountain Bushveld, the vegetation was classified as primary vegetation with a high likelihood of supporting plant species that are of conservation concern. This vegetation grew on the Class 2 ridge.

The rocky outcrops supported succulent species such as *Euphorbia shinzii*, *Cotyledon orbiculata* (plakkie) and *Aloe greatheadii*. The rocky outcrops also supported small tree species such as *Ochna pulcra* (peeling plane), *Vangueria infausta* (wild medlar), *Combretum molle* (velvet bushwillow), *Englerophytum magalismontanum* (stamvrug) and *Euclea crispa* (blue guari). A number of herbaceous species were recorded, as well as a variety of grass species. *Xerophyta retinervis* (monkey's tail) was prominent and the protected geophyte *Boophone distichia* (poison bulb) was also recorded.

All the species occurring on site are listed in Appendix B of the Fauna Assessment Report (attached under Appendix E of this report).

Plants of Conservation Importance

No Threatened or Protected Plant Species (TOPS) were recorded at the project site, nor are they expected to occur. No Red or Orange Listed plant species were recorded at the site either. However, one individual of the Declining species, *Boophone distichia* (poison bulb) was recorded on the ridge, about 200m south of the project site. Suitable habitat was present on the ridge for a number of species listed in Appendix C of the Vegetation Assessment (list of plant species that are of conservation concern), and although not recorded in walked transects, there is a likelihood that some of these species may occur south of the project site. If the proposed development does not exceed the current transformed footprint, it is unlikely that it will impact on the habitat or potential localities of these species.

Alien and Invasive Plant Species

Declared weeds and invader plant species have the tendency to dominate or replace the canopy or herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of natural ecosystems. It is therefore important that these plants are controlled and eradicated by means of an Eradication and Monitoring Programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species (Henderson, 2001).

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is the most recent legislation pertaining to alien invasive plant species. The Alien and Invasive Species Regulations was published in Government Gazette No. 37886, 1 August 2014, in terms of NEMBA.



The legislation calls for the removal and/or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river; stream; spring; natural channel in which water flows regularly or intermittently; lake; dam; or wetland. Category 3 plants are also prohibited from occurring within close proximity to a watercourse. Below is a brief explanation of the three categories in terms of the NEMBA:

- Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

The alien plant species identified on the study site are listed in Appendix B of the Vegetation Assessment Report (attached Under Appendix E). The majority of invasive species were recorded in the transformed vegetation areas and many of these are classified as category 1b invasive species. A few individuals of the major invasive weed *Campuloclinium macrocephalum* (pom-pom weed) were noted in the secondary and disturbed grassland, from where this species could likely and quickly spread to the rocky grasslands.

Vegetation Importance and Sensitivity

A Vegetation Sensitivity Assessment was conducted for the project property. The results of the assessment indicated that the Transformed vegetation had limited to no natural habitat remaining and is therefore of low sensitivity to the proposed development. The Secondary and Disturbed grasslands were historically cultivated or disturbed and typically included a higher frequency of pioneer species, a low diversity of indigenous species and a low basal cover. However, the secondary and disturbed grassland currently play a role as buffer between the on-site activities and the natural vegetation on the ridge. The rocky grassland on the ridge was in an untransformed state, performing an ecological function and supporting Declining plant species. In addition, the possibility exist that threatened plant species could occur here. As per the minimum requirements for Biodiversity Assessment in the Gauteng Province, all good condition natural vegetation must be designated as ecologically sensitive. In addition, the vegetation situated on a class 2 ridge, lies within the Gauteng C-plan's 'Important'



area and forms part of the critically endangered Witwatersberg Pretoria Mountain Bushveld ecosystem and is classified as being sensitive to the development. Figure 23 shows the vegetation sensitivity of the project property as well as a 200m area around the property. As can be seen on the figure, the vegetation sensitivity of the project property is Low and Low-Medium. Areas South of the project property have a High sensitivity (Dimela Eco Consulting, 2015).



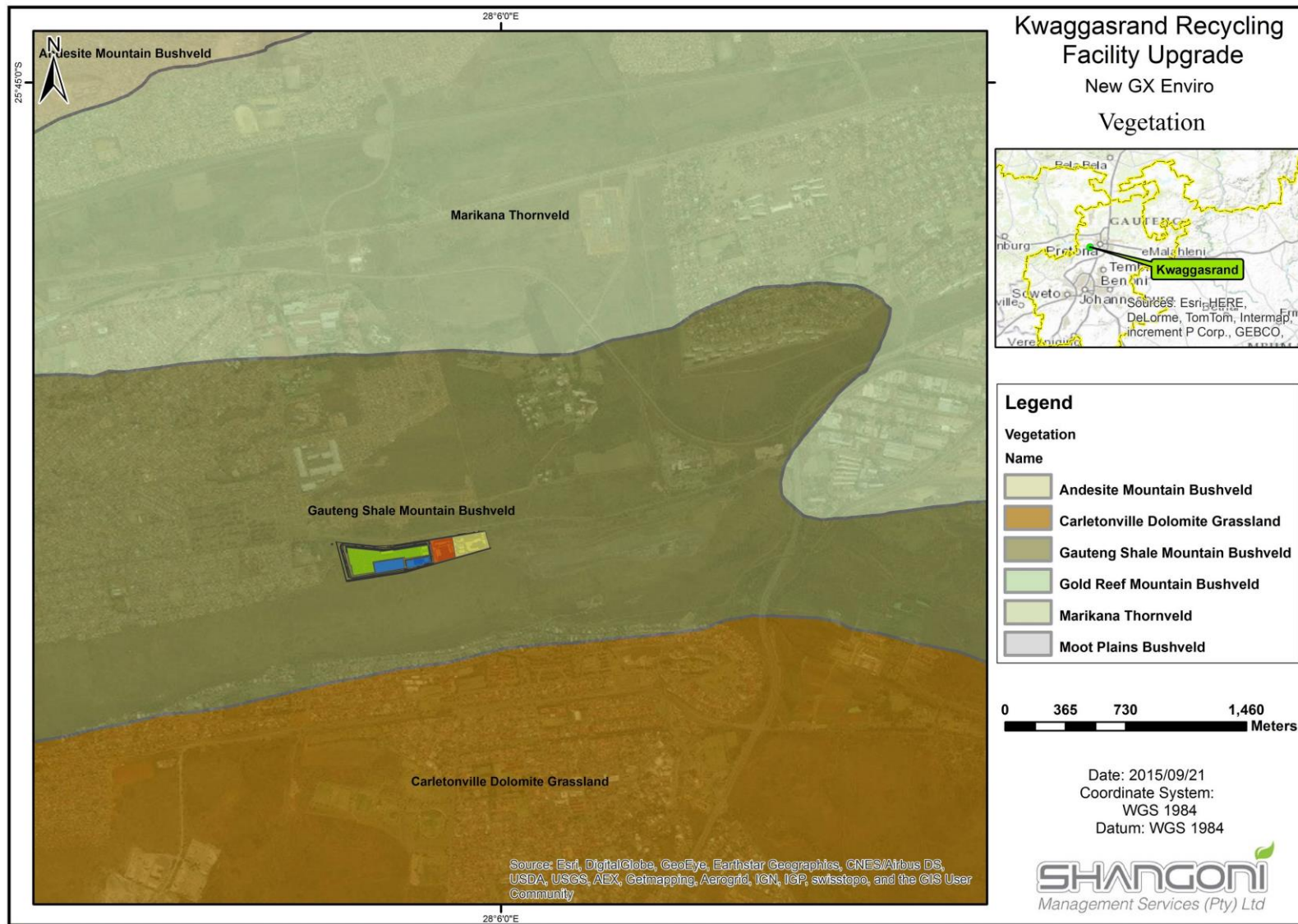


Figure 20: Vegetation type present at the site

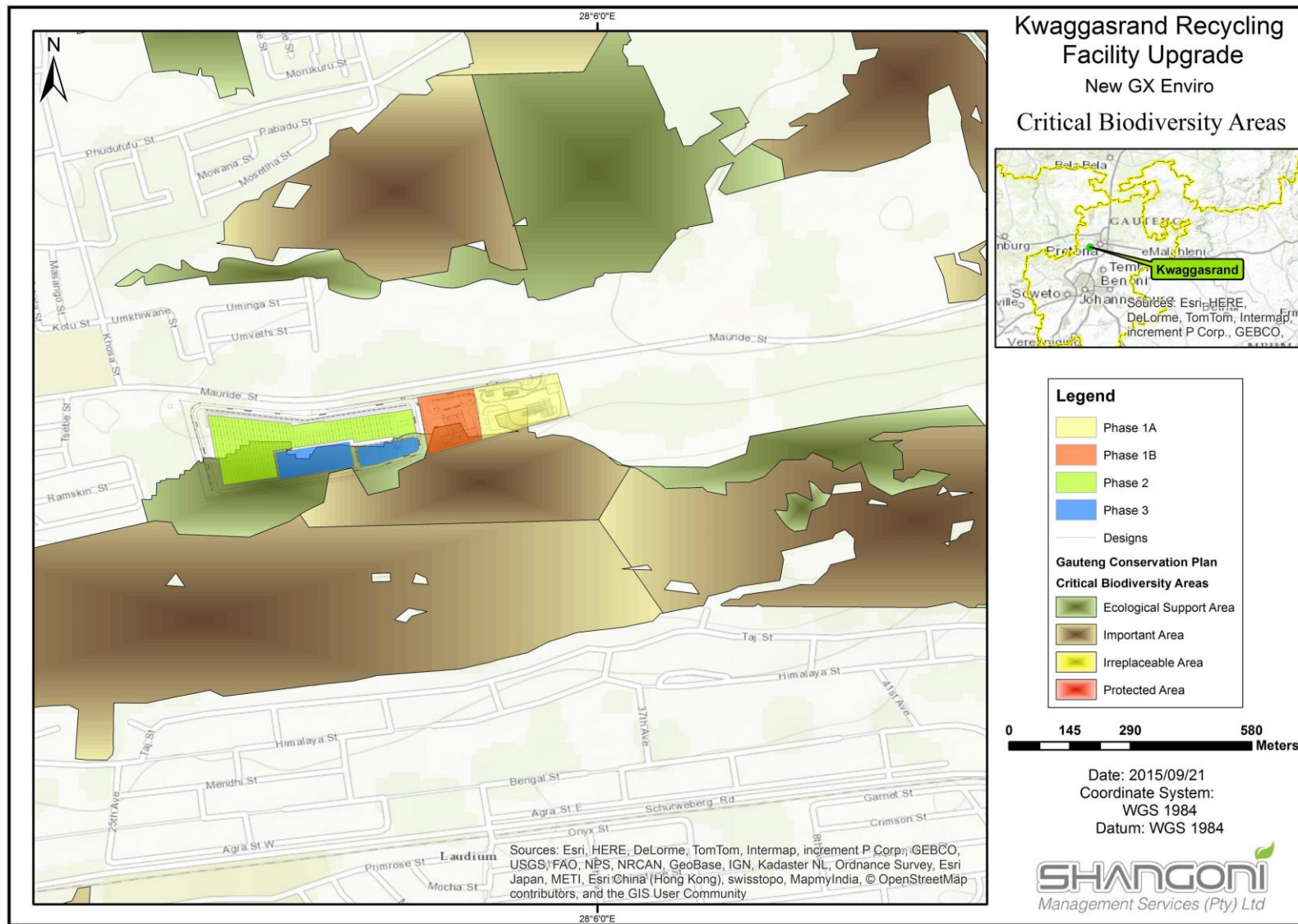


Figure 21: Critical Biodiversity Areas

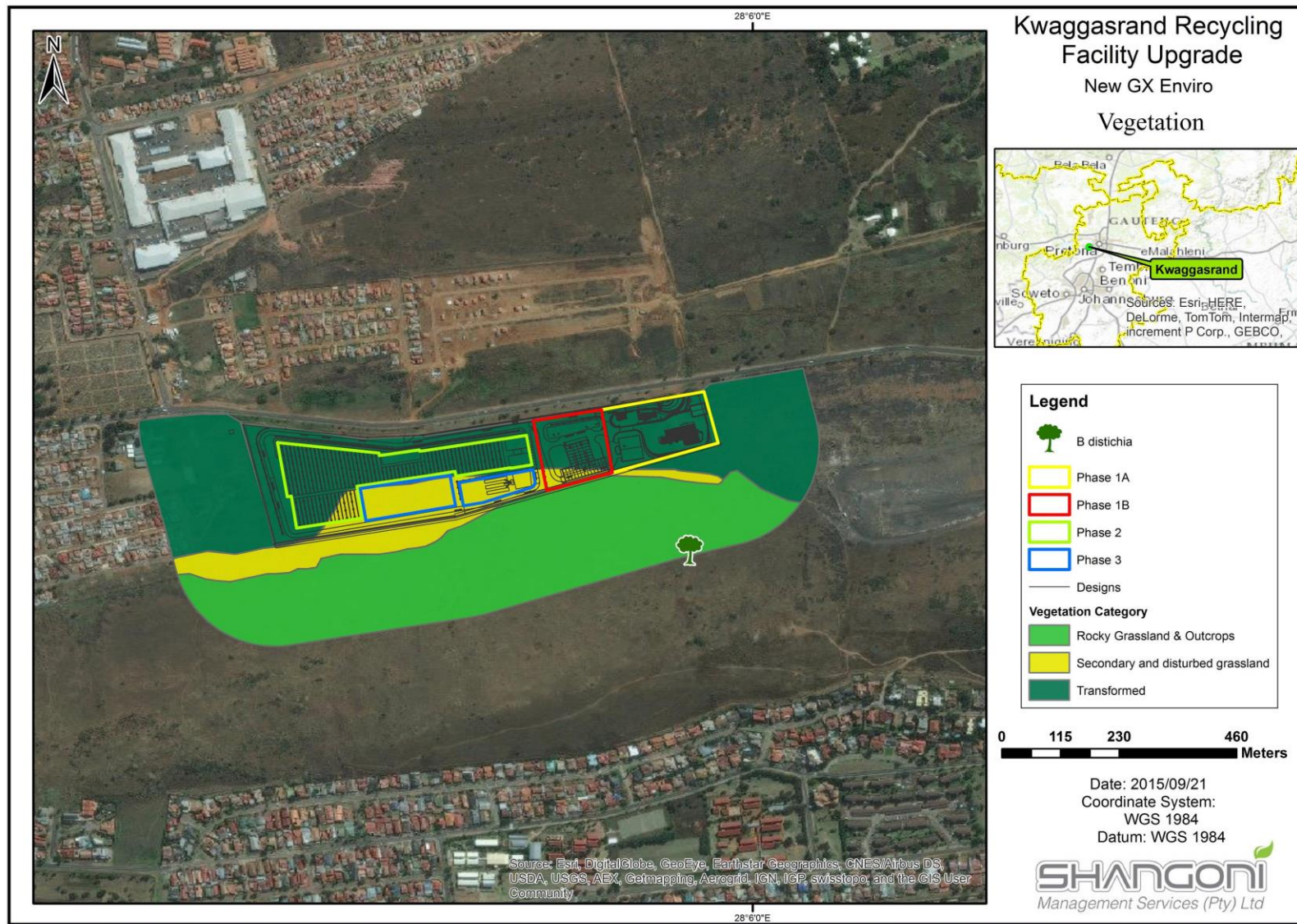


Figure 22: Vegetation on and within 200m of the project property

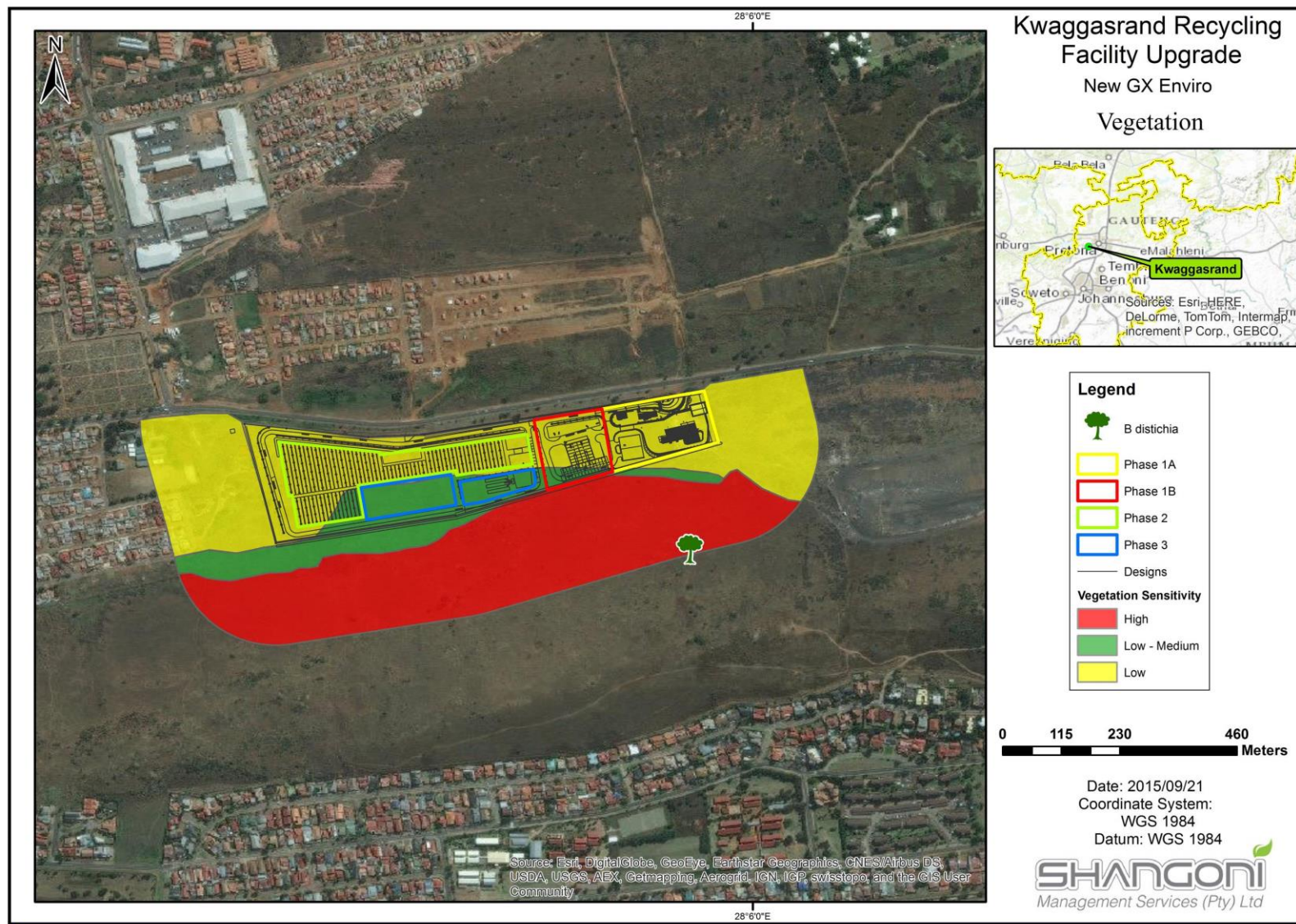


Figure 23: Vegetation sensitivity of the project property and 200m around the property

2.7 Animal life

The site is situated within Pretoria and is mostly in a disturbed state. For this reason, a desktop assessment of the animal life of the general area, specifically any remaining natural areas, was conducted. Please note that only a few or none of these animal species may be present at the project site.

2.7.1 Commonly occurring species

A list of commonly occurring animal species in the study area, according to the South African Biodiversity Information Facility (SIBIF), is attached to this report under Appendix E.

2.7.2 Endangered species

The following tables show the IUCN (International Union for Conservation of Nature and Nature Resources) Red List of Threatened Species that are found in the North West Province. Importantly, these species are not necessarily present at the specific project site. The following abbreviations are used: EN: Endangered; VU: Vulnerable; NT: Near Threatened; DD: Data Deficient and LC: least concern.

Table 9: IUCN Red List of threatened mammal species (IUCN, 2013)

Scientific name	Common name	Red List Status
<i>Mystromys albicaudatus</i>	White-tailed Mouse/White-tailed Rat	EN

Table 10: IUCN Red List of threatened insect species (IUCN, 2013)

Scientific name	Common name	Red List Status
<i>Acanthopplus discoidalis</i>	Armoured Katydid	LC
<i>Aloeides dentatis</i>	Roodepoort Copper	VU
<i>Anax ephippiger</i>	Vagrant Emperor	LC
<i>Anax imperator</i>	Blue Emperor Dragonfly	LC
<i>Anax speratus</i>	Orange Emperor	LC
<i>Anax tristis</i>	Black Emperor	LC
<i>Azuragrion nigradorsum</i>	Black-tailed Bluet	LC
<i>Cacyreus virilis</i>	Alternative Bush Blue	LC
<i>Capys alphaeus</i>	Orange-banded Protea Butterfly	LC
<i>Ceriagrion glabrum</i>	Common Pond Damsel	LC
<i>Clonia uvarovi</i>	Uvarov's Clonia	VU
<i>Clonia wahlbergi</i>	Wahlberg's Clonia	LC
<i>Cloniella praedatoria</i>	Predatory Slender Clonia	DD

Scientific name	Common name	Red List Status
<i>Conchotopoda crassicauda</i>	Rare Dimorphic Leaf Katydid	DD
<i>Conchotopoda parva</i>	Highveld Dimorphic Leaf Katydid	DD
<i>Conocephalus caudalis</i>	Long-tailed Meadow Katydid	LC
<i>Conocephalus iris</i>	Yellowtail Meadow Katydid	LC
<i>Crocothemis sanguinolenta</i>	Little Scarlet	LC
<i>Diplacodes lefebvrii</i>	Black Percher	LC
<i>Enyaliopsis transvaalensis</i>	Northern Armoured Katydid	LC
<i>Eulioptera reticulata</i>	Reticulated Leaf Katydid	LC
<i>Eurycorypha cereris</i>	Kalahari Oblong-eyed Katydid	LC
<i>Eurycorypha lesnei</i>	Lesne's Oblong-eyed Katydid	LC
<i>Eurycorypha meruensis</i>	African Oblong-eyed Katydid	LC
<i>Ischnura senegalensis</i>	Common Bluetail	LC
<i>Orthetrum chrysostigma</i>	Epaulet Skimmer	LC
<i>Lestes pallidus</i>	Pallid Spreadwing	LC
<i>Lestigomphus angustus</i>	Common Fairytail	LC
<i>Melidia brunneri</i>	Brunner's Melidia	LC
<i>Nesciothemis farinosa</i>	Black-tailed Skimmer	LC
<i>Orthetrum abbotti</i>	Abbott's Skimmer	LC
<i>Orthetrum caffrum</i>	Two-striped Skimmer	LC
<i>Orthetrum trinacria</i>	Long Skimmer	LC
<i>Palpopleura deceptor</i>	Deceptive Widow	LC
<i>Pantala flavescens</i>	Globe Skimmer	LC
<i>Paragomphus genei</i>	Green Hooktail	LC
<i>Paternympha narycia</i>	Spotted-eye Brown	LC
<i>Phaneroptera sparsa</i>	Sickle-bearing Leaf Katydid	LC
<i>Pseudagrion draconis</i>	Mountain Sprite	LC
<i>Pseudagrion kersteni</i>	Kersten's Sprite	LC
<i>Pseudorhynchus hastifer</i>	Spear Reed Katydid	LC
<i>Rhyothemis semihyalina</i>	Phantom Flutterer	LC
<i>Ruspolia ampla</i>	Robust Conehead Katydid	LC
<i>Sympetrum fonscolombii</i>	Red-veined Darter	LC
<i>Terpnistria zebrata</i>	Zebra Katydid	LC
<i>Tholymis tillarga</i>	Old World Twister	LC
<i>Tramea basilaris</i>	Keyhole Glider	LC
<i>Tramea limbata</i>	Ferrugineus Glider	LC
<i>Trithemis annulata</i>	Violet Dropwing	LC
<i>Trithemis arteriosa</i>	Red-veined Dropwing	LC

Scientific name	Common name	Red List Status
<i>Trithemis furva</i>	Navy Dropwing	LC
<i>Trithemis kirbyi</i>	Orange-winged Dropwing	LC
<i>Tuxentius calice</i>	White Pierrot	LC
<i>Tylopsis bilineolata</i>	Striped Grass Katydid	LC
<i>Tylopsis continua</i>	Common Grass Katydid	LC
<i>Zabalius ophthalmicus</i>	Blue-legged Sylvan Katydid	LC
<i>Zygonyx torridus</i>	Ringed Cascader	LC

Table 11: IUCN Red List of threatened reptile species (IUCN, 2013)

Scientific name	Common name	Red List Status
<i>Duberria lutrix</i>	Common Slug Eater	LC
<i>Chamaeleo dilepis</i>	Common African Flap-necked Chameleon	LC
<i>Lygodactylus nigropunctatus</i>	Black-spotted Dwarf Gecko	LC

Table 12: IUCN Red List of threatened millipede (Diplopoda) species (IUCN, 2013)

Scientific name	Common name	Red List Status
<i>Doratogonus levigatus</i>	-	LC
<i>Doratogonus rugifrons</i>	-	LC
<i>Doratogonus subpartitus</i>	-	DD

2.8 Surface water

2.8.1 Catchment areas

The site is situated in the A23D quaternary catchment area as shown in the figure below. This quaternary catchment region is located within the Crocodile (West) and Marico Water Management Area (WMA). The main rivers in the WMA, the Crocodile and Marico Rivers, give rise to the Limpopo River at their confluence (DWAF, 2004).



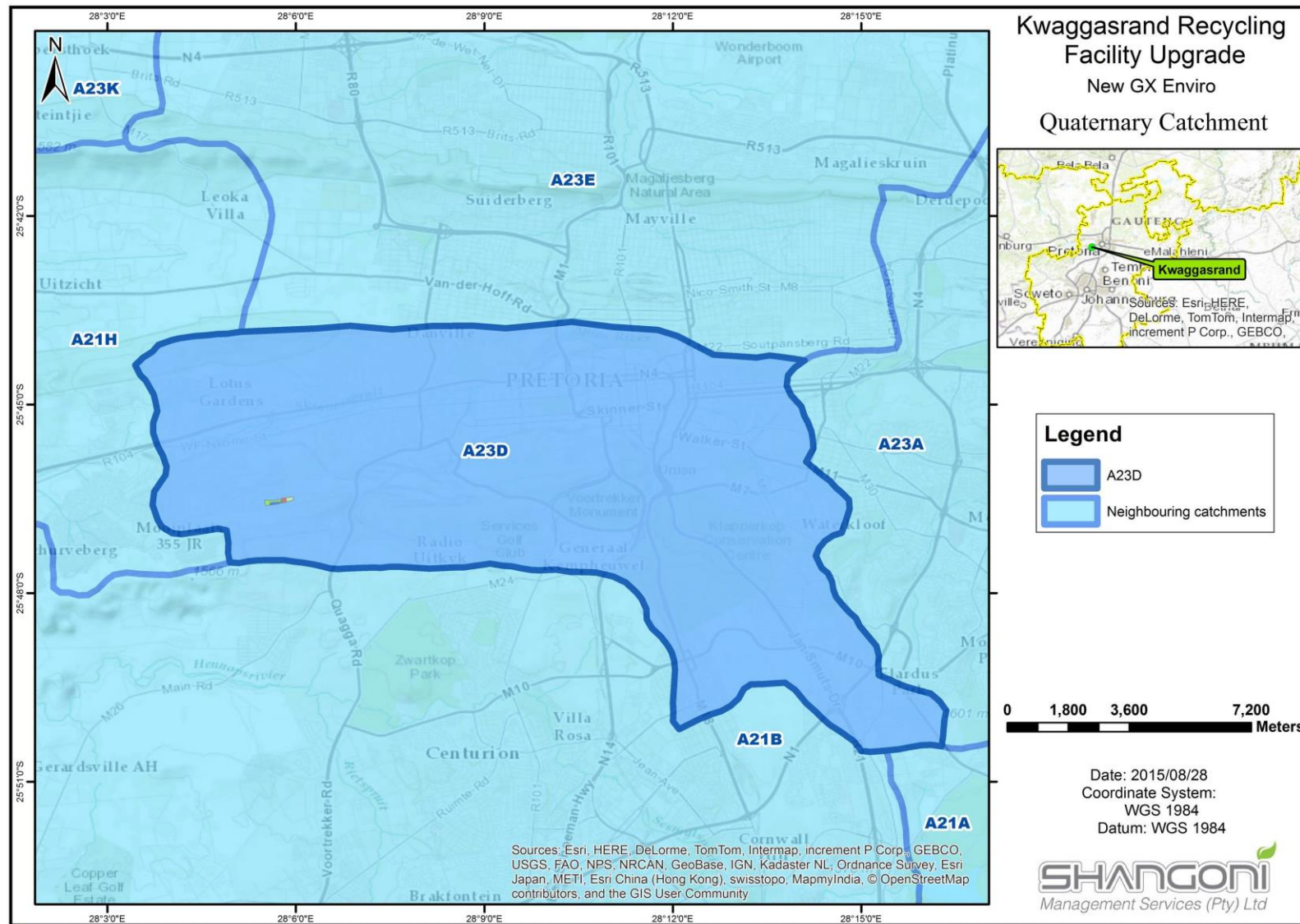


Figure 24: Quaternary Catchment in which the site is located

2.8.2 Mean annual runoff (MAR)

The total Mean Annual Runoff for the Upper Vaal Water Management Area is 855 million m³/annum and the Ecological Reserve is 164 million m³/annum (DWAF, 2004).

2.8.3 Surface water quantity, quality and use

No information is available regarding surface water in the vicinity of the site. A municipal water supply will be used on the site.

2.8.4 Water authority

The relevant water authority is the Department of Water and Sanitation, Pretoria Regional Office.

2.9 Groundwater

2.9.1 Aquifer type

The aquifer type of the area is b3, fractured aquifers with median borehole yields of 0.5-2 litres/second (Geohydrological Map Sheet 2526, 1999). The aquifers are classified as “minor” aquifers (DWA, 2012).

The groundwater recharge is approximately 14mm per annum and the baseflow is approximately 36mm per annum in the area of the site (DWAF, 2010).

2.9.2 Depth of water tables

The depth of the water table is approximately 14 mbgl (metres below ground level) in the area of the site (DWAF, 2010).

2.9.3 Groundwater quality

The groundwater quality, in terms of mean TDS (total dissolved solids), underlying the area of the site is 166mg/l (DWAF, 2010).

2.10 Sensitive landscapes

Two small, flat wetlands are located 0.58km and 1.15km south-east of the site, respectively. A larger seep wetland is located approximately 2km north of the site. These wetlands are shown in the figure below. According to the ArcGIS databases, no wetlands are present on site.



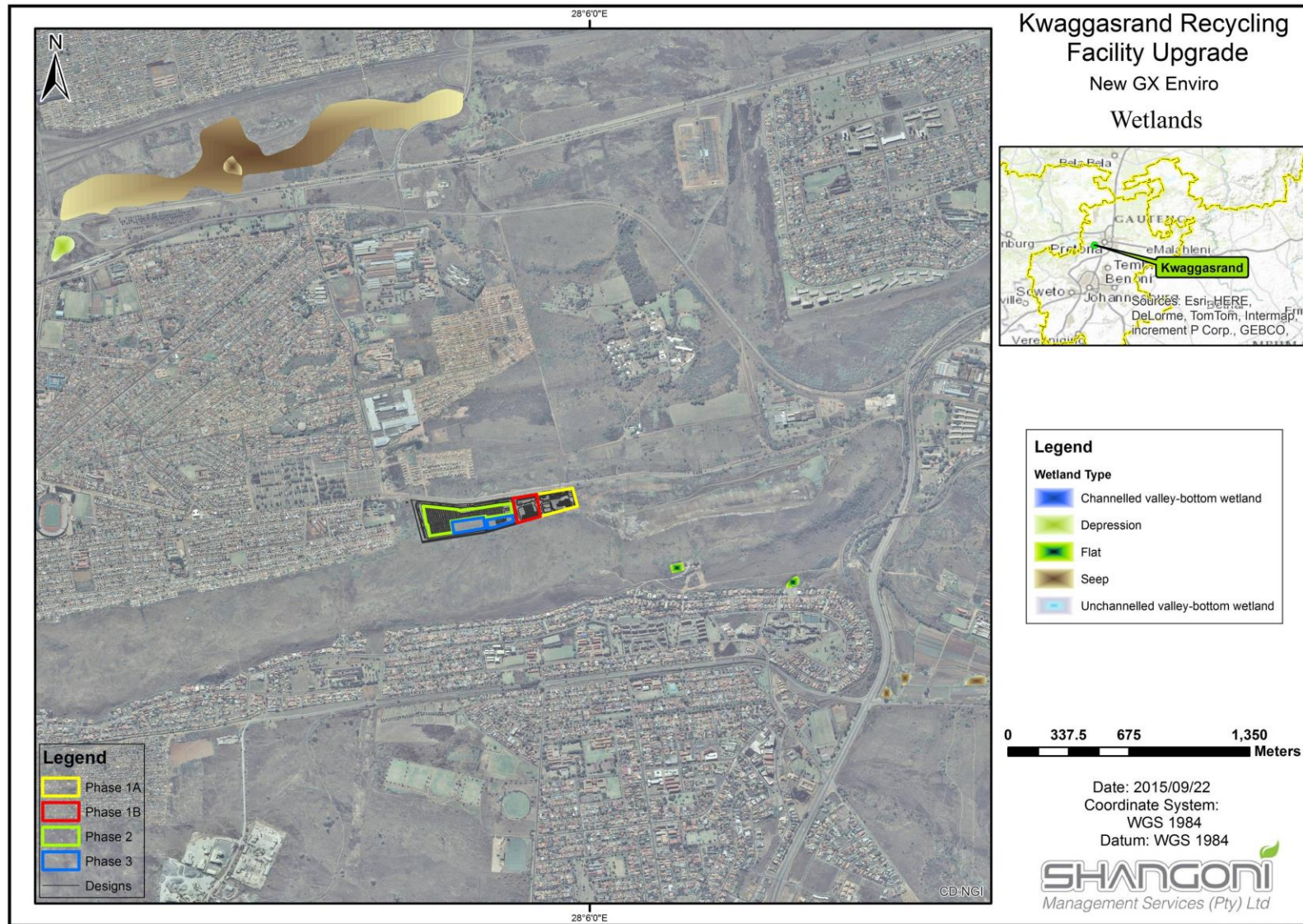


Figure 25: Wetlands Present Near the Site

2.11 Sites of archaeological and cultural interest

Almost the entire project property has been disturbed in the past. The South African Heritage Resources Agency was informed of the proposed development and indicated that they require a Heritage Impact Assessment and a Desktop Palaeontological Impact Assessment Survey to be conducted. These studies have been conducted and uploaded onto SAHRIS. Below follows a summary of the findings of the two studies.

Phase 1 Heritage Impact Assessment

A Phase 1 Heritage Impact Assessment was conducted by APelser Archaeological Consulting in July 2015. The following is an extract from the assessment's report.

Background research indicated that there are a number of cultural heritage sites and feature, both historical and archaeological, in the larger geographic area of the project property. The study area (entire project property) has been disturbed to a large degree by recent activities, such as the dumping of building rubble and other refuse, and sections have also been flattened/bulldozed and cleared of vegetation. If any sites or features of heritage significance did exist onsite in the past, they would have been disturbed or destroyed.

The assessment of the project property found no sites, features or objects of cultural heritage (archaeological or historical) origin or significance (APAC, 2015).

Palaeontological Desktop Assessment

The study area is underlain by Vaalian aged shale, sandstone, quartzite and conglomerate of the Timeball Hill Formation, Pretoria Group, and Vaalian aged dolomite and chert of the Malmani Subgroup, Chuniespoort Group, Transvaal Supergroup. In the Timeball Hill Formation, stromatolites have been recorded. These fossils are restricted to thin chert and carbonate rock sequences. The carbonates with stromatolites will probably also contain micro-fossils that will be of significant importance for understanding the palaeo-environments of the region during the Vaalian. Dolomites of the Malmani Subgroup are known to exhibit some of the best examples of stromatolites from the Transvaal Supergroup. These structures, that are mainly associated with the dolomitic layers, are important indicators of palaeo-environments in the Transvaal Basin (Johnson *et al.*, 2009).

The likely impact of the proposed development on local fossil heritage is determined on the basis of the palaeontological sensitivity of the rock units concerned and the nature and scale of the development itself, most notably the extent of bedrock excavation envisaged. The figure below shows the sensitivities of the project property. The very high fossiliferous potential of the dolomite and chert of the Malmani Subgroup strata refers mainly to the presence of stromatolites as well as the important alert for fossiliferous Caenozoic aged cave breccias that are associated with these rocks. The High Palaeontological sensitivity allocated to the Timeball Hill Formation of the Pretoria Group refers to the



potential presence of stromatolite structures in the calcareous mudstone and carbonate beds in the Formation.

The fossils associated with the sedimentary rocks of the Pretoria and Chuniespoort Groups are normally exposed in natural outcrops where the rocks have been exposed to natural weathering for some time, or in recently excavated material where the sedimentary rock samples are available for close inspection. Interpretation of the Google images for the site indicated that the site is most probably covered in deep sandy soil and exposure of rock samples will only result from deep excavation into bedrock. If deep excavation is envisaged, the excavation material will potentially contain significant fossil rich material (Groenewald, 2015).



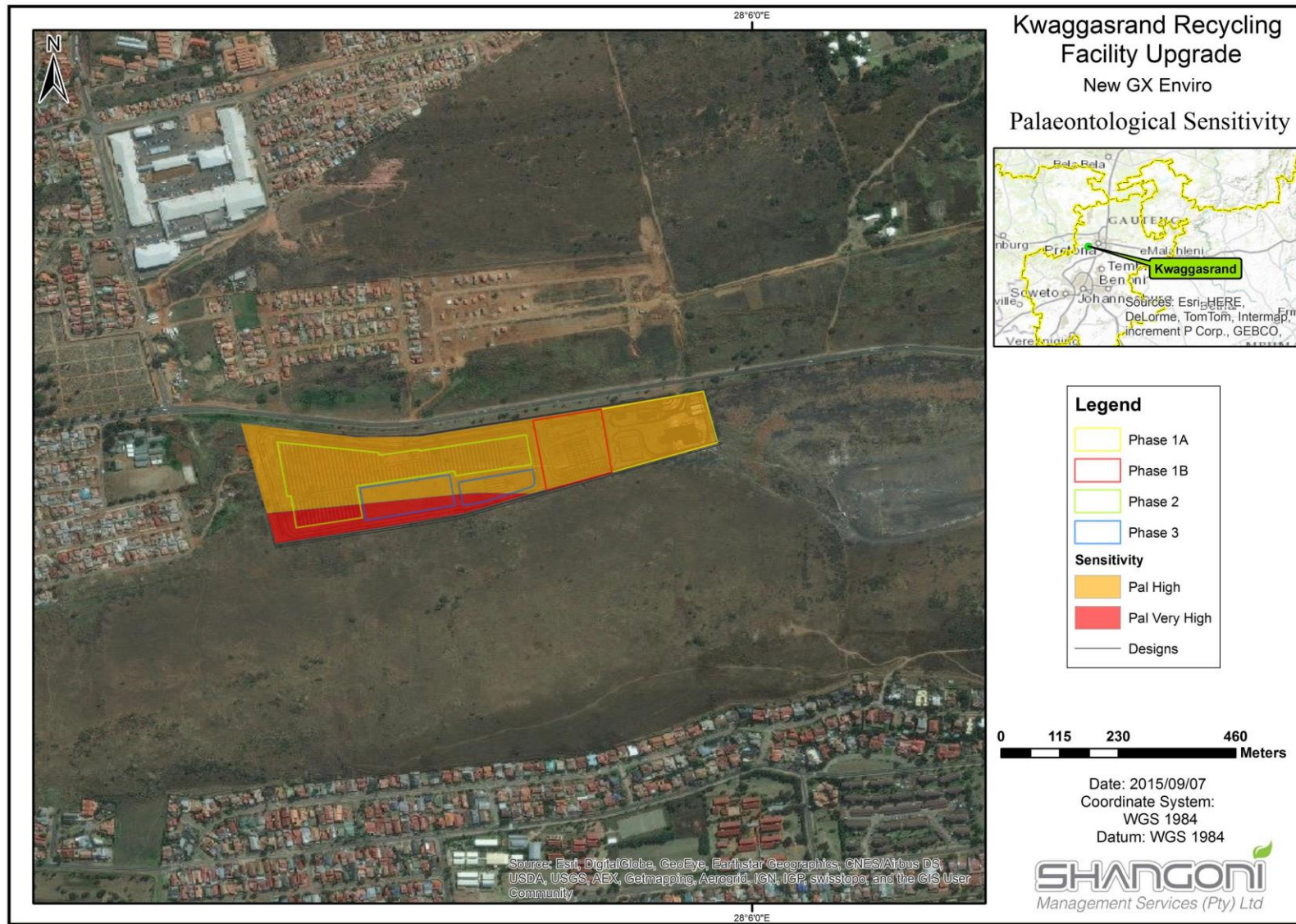


Figure 26: Palaeontological Sensitivity of the project property

2.12 Air Quality

The site is not situated within an Airshed Priority Area and the following are the main sources of atmospheric emissions in the municipal area:

- Power generation (Pretoria West and Rooiwal power stations);
- Industrial processes, such as iron, steel and ceramic industries;
- Specific industries such as dyers, printers and spray painters;
- Household fuel combustion;
- Biomass burning;
- Transportation (petrol and diesel vehicle emissions);
- Aviation emissions;
- Mining activities;
- Landfill sites;
- Tyre burning;
- Agricultural activities;
- Vehicle entrainment on dust roads;
- Veldt fires;
- Incinerators; and
- Wind-blown dust from open areas.

The main areas of concern in terms of diminishing air quality within the CTMM are as follows:

- Areas situated close to industrial areas like the Moot and Pretoria West;
- Areas in close proximity to busy intersections and highways, which are affected by vehicle emissions; and
- Informal settlements where wood and coal are burnt as energy sources, mostly for cooking purposes. This is particularly evident in cold, winter months when fires are also used for the generation of heat (Airshed Planning Professionals, 2005).

2.13 Noise

According to the Appendix F of the City of Tshwane Noise Management Policy, 2004, the main sources of environmental noise in the municipal area include the following:

- Road traffic on highways, main arterial roads and lower order roads;
- Freight and passenger trains;
- Large public transport termini and stops such as those for taxis, buses and trains;
- Airfields (Wonderboom Airport, Zwartkops Military Airbase and the Waterkloof Military Airbase);
- Helipads;
- Industrial areas;
- Quarrying operations;



- Mining operations;
- Office blocks;
- Shopping centres;
- Sporting venues; and
- Venues where musical entertainment occurs, including restaurants, stadiums and so forth (Calyx Environmental CC, 2004).

The main sources of noise in the vicinity of the site include road traffic on Maunde Street, residential activities in Atteridgeville and any still-existing activities at the Kwaggasrand landfill site.

2.14 Visual aspects

The site is located next to Maunde Street and is clearly visible to motorists travelling on this road. The site is also visible to adjacent landowners to the north, east and west. The land to the south of the site is open and there are therefore limited receptors to the south. A Landscape Development Plan (LDP) is being compiled for the proposed project and will be completed per phase, as part of the Building Plan Approval process with the CTMM.

2.15 Socio-economic aspects

2.15.1 Demography

According to the 2011 census, 2 921 488 people formed part of the 911 536 households in the City of Tshwane Metropolitan Municipality. The average household size is 3.2 people per household. The growth rate in the municipality is 3.10% per annum. There are 99 men for every 100 women in the municipality (Statistics South Africa, 2011). The table below shows the age structure of the municipality.

Table 13: Demographic Profile of the City of Tshwane Metropolitan Municipality

Age Group	Percentage of Population (%)
Under 15 years of age	23.2
15 to 64 years of age	71.9
Over 65 years of age	4.9
Total	100

2.15.2 Major economic activities

According to the City of Tshwane Integrated Development Plan (Draft 2014/2015 review), the city has an established manufacturing sector and the automotive industry plays a large role in this sector. The city has the highest concentration of automotive industries, including Original Equipment Manufacturers (OEMs) in the country. The municipality is the fastest growing municipality in South Africa (City of Tshwane, 2014).



2.15.3 Unemployment and employment

The 2011 census found that the official unemployment rate in the City of Tshwane Metropolitan Municipality was 24.2% and the youth unemployment rate (15 to 34 years of age) was 32.6%. The dependency ratio was 39 per 100 people between the ages of 15 and 64 years (Statistics South Africa, 2011).



3. APPLICABLE LEGISLATION AND GUIDELINES

The table below provides an indication of the main legislation, policies and/or guidelines applicable to the Kwaggasrand Recycling Facility Upgrade project.

Table 14: Applicable legislation, policies and/or guidelines

Title of legislation, policy or guideline	Administering authority	Aim of legislation, policy or guideline
Laws of General Application		
The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)	-	To establish a Constitution with a Bill of Rights for the RSA.
Environment Conservation Act, 1989 (Act No. 73 of 1989 as amended)	Gauteng Department of Agriculture and Rural Development	To control environmental conservation.
National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.	Gauteng Department of Agriculture and Rural Development	To provide for the integrated management of the environment, and to regulate the 'Duty of Care' Principle.
National Environmental Management: Waste Act (Act No. 59 of 2008)	Gauteng Department of Agriculture and Rural Development	To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation.
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000 as amended)	-	To give effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights.
Air Quality and Noise		
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	City of Tshwane Metropolitan Municipality	To reform the law regulating air quality to protect the environment by providing reasonable measures for the prevention of pollution. To provide for national norms and standards regulating air quality monitoring, management and control.
Water Management		
National Water Act (NWA), 1998 (Act No. 36 of 1998)	Department of Water and Sanitation	To provide for fundamental reform of the law relating to water



Title of legislation, policy or guideline	Administering authority	Aim of legislation, policy or guideline
		resources.
Waste Management		
National Environmental Management: Waste Act (Act No. 59 of 2008)	Gauteng Department of Agriculture and Rural Development	To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation.
National Environmental Management: Waste Act (Act No 59 of 2008) – Waste Classification and management regulations (GNR. 634 of 23 August 2013)	Gauteng Department of Agriculture and Rural Development	To regulate the classification and management of waste in a manner that supports and implements the provisions of the Waste Act.
GNR. 926 of 29 November 2013 – National Norms and Standards for the Storage of Waste	Gauteng Department of Agriculture and Rural Development	To provide a uniform national approach to the management of waste storage facilities, to ensure best practice in the management of waste storage facilities and to provide minimum standards for the design and operation of new and existing waste storage facilities.
GNR. 634 of 23 August 2013 – Waste Classification and Management Regulations	Gauteng Department of Agriculture and Rural Development	To regulate the classification and management of waste in a manner that supports and implements the provisions of the Waste Act, to establish a mechanism and procedure for the listing of waste management activities that do not require a Waste Management Licence, to prescribe requirements for the disposal of waste to landfill, to prescribe requirements and timeframes for the management of certain wastes and to prescribe general duties of waste generators, transporters and managers.
Environmental Conservation Act, 1989, Waste Tyre Regulations, 2008.	Gauteng Department of Agriculture and Rural Development	To regulate the management of waste tyres by providing for the regulatory mechanisms.
Biodiversity		
National Environmental	Gauteng Department of Agriculture	To provide for the management and



Title of legislation, policy or guideline	Administering authority	Aim of legislation, policy or guideline
Management Biodiversity Act, 2004 (Act No. 10 of 2004)	and Rural Development	conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998.
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	Gauteng Department of Agriculture and Rural Development	To provide for control over the utilisation of the natural agricultural resources of South Africa in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants.
Soil and Land Management		
National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.	Gauteng Department of Agriculture and Rural Development	To provide for the integrated management of the environment and to regulate the 'Duty of Care' Principle.
Environment Conservation Act, 1989 (Act No. 73 of 1989 as amended)	Gauteng Department of Agriculture and Rural Development	To control environmental conservation.
Heritage and Archaeological Resources		
National Heritage Resources Act No 25 of 1999 (Act No. 25 of 1999 as amended)	South African Heritage Resources Agency	To introduce an integrated and interactive system for the management of the national heritage resources; to promote good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations
Protected Areas		
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003 as amended)	Gauteng Department of Agriculture and Rural Development	To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.
Planning of New Activities		
National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.	Gauteng Department of Agriculture and Rural Development	To provide for the integrated management of the environment and to regulate the 'Duty of Care' Principle.
National Environmental Management: Waste Act (Act No.	Gauteng Department of Agriculture and Rural Development	To reform the law regulating waste management in order to protect



Title of legislation, policy or guideline	Administering authority	Aim of legislation, policy or guideline
59 of 2008)		health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation.
Government Notice (GN) 718: “ <i>List of waste management activities that have, or are likely to have a detrimental effect on the environment</i> ”, dated 2009.	Gauteng Department of Agriculture and Rural Development	To regulate and control the authorisation of certain waste-related listed activities.



4. PUBLIC PARTICIPATION PROCESS

4.1 Objectives of the Public Participation Process (PPP)

Section 24 of the Constitution of the Republic of South Africa of 1996 guarantees everyone the right to an environment that is not harmful to their health and well-being and to have the environment protected for the benefit of present and future generations. In order to give effect to this right, the National Environmental Management Act (NEMA), 1998, as amended, came into effect.

In terms of Section 24(4) of the NEMA, 1998, as amended, procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must, *inter alia*, ensure, with respect to every application:

- Coordination and cooperation between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than one organ of state;
- That the findings and recommendations flowing from an investigation, the general objective of integrated management laid down in NEMA, 1998, as amended, and the principles of environmental management set out in Section 2 of NEMA, 1998, as amended, are taken into account in any decision made by the organ state in relation to any proposed policy, programme, process, plan or projects, consequences or impacts; and
- Public information and participation procedures which provide all integrated and affected parties, including all organs of state in all spheres of government that may have jurisdiction over any aspect of the activity, with a reasonable opportunity to participate in those information and participation procedures.

One of the general objectives of integrated environmental management laid down in Section 23(2) (d) of NEMA, 1998, as amended, is to: “ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment”.

The National Environmental Management Principles as stipulated in NEMA, 1998, as amended state:

- “Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
- The participation of all interested and affected parties in environmental governance must be promoted, and all people must have an opportunity to develop the understanding, skills and capacity necessary to achieve equitable and effective participation, and participation by vulnerable and disadvantage persons must be ensured”.



4.2 Legislation and guidelines followed for the PPP

The public participation process for this project was conducted by Shangoni Management Services in terms of:

- The procedures and provisions in terms of the NEMA 1998, as amended;
- The procedures and provisions in terms of the NEM:WA, 2008;
- Chapter 6 of the EIA Regulations of 2010;
- GN 807; Public Participation Guideline in the Environmental Impact Assessment Process, dated October 2012; and
- Other relevant legislation such as the Promotion of Access to Information Act (PAIA), 2000.

Refer to Appendix D for an extract regarding the required public participation process to be followed, taken from the relevant legislation and guidelines

4.3 Public Participation Process followed

4.3.1 Identification and registration of I&APs and key stakeholders

The table below lists the landowners and adjacent landowners identified and notified (by means of e-mail, fax and/or registered post) of the proposed project. Copies of the notifications to the I&APs have been included in Appendix D.

Table 15: List of landowners and adjacent landowners identified and notified

Farm Name	Title deed	Owner
Portion 206 of the farm Pretoria Town and Townlands 351 JR	G225/956	City of Tshwane Metropolitan Municipality
Portion 293 of the farm Pretoria Town and Townlands 351 JR	T45099/981	Lifetime Township Developers (Pty) Ltd (JT Group)
Portion 294 of the farm Pretoria Town and Townlands 351 JR	T45099/981	Lifetime Township Developers (Pty) Ltd (JT Group)
Portion 6 of the farm Pretoria Town and Townlands 351 JR	G294/908	City of Tshwane Metropolitan Municipality
Remaining extent of the farm Atteridgeville 607 JR	T69319/1987	City of Tshwane Metropolitan Municipality
16251/Erf 353 JR (Atteridgeville Properties)		Safari Retail/Investments

All organs of state that may have jurisdiction in respect of the proposed project are considered to be registered I&APs.

The following organs of state were notified of the proposed project:

- Gauteng Department of Local Government and Housing;



- Gauteng Department of Community Safety;
- Gauteng Department of Economic Development;
- Gauteng Department of Finance;
- Gauteng Department of Health;
- Gauteng Department of Infrastructure Development;
- Gauteng Department of Roads and Transport;
- Gauteng Department of Human Settlements;
- Gauteng Department of Social Development;
- Gauteng Department of Co-operative Governance and Traditional Affairs;
- Department of Water and Sanitation;
- City of Tshwane Metropolitan Municipality; and
- South African Heritage Resources Agency.

Copies of the notifications to the organs of state have been included in Appendix D and examples are included in the figures below.





Shangoni Management Services Pty (Ltd)
Reg: 2002/000002/07 VAT: 489 019 1069

Tel +27(0)12 807 7036 Fax +27(0)12 807 1014
E-mail info@shangoni.co.za www.shangoni.co.za
Block C8, Block@Nature 472 Botterklapper Street The Willows 0081
PO Box 74726 Lynnwood Ridge 0040

24 February 2015

REF: Gaut: 002/14-15/W0015; SMS REF: NEW-KWA-14-09-11

Department of Water and Sanitation – Catchment A23D

Private Bag X313
Pretoria
0001

Attention: Siwelane Lilian

NOTICE OF APPLICATION FOR A WASTE MANAGEMENT LICENCE FOR THE PROPOSED KWAGGASRAND RECYCLING FACILITY UPGRADE PROJECT FOR NEW GX ENVIRO SOLUTIONS AND LOGISTICS HOLDINGS (PTY) LTD

You are hereby notified that an application for a Waste Management Licence in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA), has been lodged with the Gauteng Department of Agriculture and Rural Development (GDARD).

Applicant: New GX Enviro Solutions and Logistics Holdings (Pty) Ltd

Project Name: Kwaggasrand Recycling Facility Upgrade

Project Location: Portion 463 of the farm Pretoria Town and Townlands 351 JR, Gauteng

Waste Management Licence Application Process Reference Number: Gaut: 002/14-15/W0015

Project Description:

New GX Enviro is a waste management company specialising in the provision of waste disposal and recycling solutions.

The proposed project is the upgrading of the Kwaggasrand Recycling Facility. The facility has an existing building where general waste is currently sorted and recycled by hand. General waste from Region 3 and Region 4 of the City of Tshwane is taken to the recycling facility for sorting. Recyclable waste is collected from the incoming waste stream and is taken off site for sale or as raw material for manufacturing processes. Non-recyclable waste was taken to the adjacent Kwaggasrand landfill site for disposal, but this facility has subsequently closed.

Shangoni Management Services (Pty) Ltd Directors R B Hayes J Nel J A van Rooy C J Potgieter H L De Villiers K Pitje

Figure 27: Notification letter - Page 1



Phase 1 of the project: A Materials Recovery Facility (MRF) will be introduced adjacent to the existing recycling building. The MRF will optimise the existing manual sorting process. At the MRF, the following waste streams will be sorted, screened, baled or crushed:

- Cardboard;
- Paper;
- Plastic;
- Cans; and
- Glass.

At the proposed Waste Tyre Crumbing Facility, waste tyres will be de-beaded, cut, shredded, screened and grinded into rubber crumbs.

Phase 2 of the project:

1. Green waste: A composting facility will be set up on open land next to the above mentioned recycling building.
2. Wet waste: Wet waste will be managed in two ways at the facility. In the first process, the wet waste will be loaded into an in-vessel composter where the material will be aerated. The resultant compost will be sold and exhaust fumes will be extracted through a bio-filter. In the second process, the recyclable fractions will be removed and the remaining waste will be baled. Wastewater from this process will be treated and released into the municipal sewage system.

Phase 3 of the project: A building rubble crushing plant will be erected on open land adjacent to the proposed composting facility.

A Background Information Document (BID) and Interested and Affected Party Registration Form is also attached hereto in order to provide more detail with regards to the proposed project as well as for persons to register as I&APs for the proposed project.

Invitation to participate: Should you wish to be registered as an Interested and Affected Party (I&AP) or comment on the above-mentioned project and application process, please submit a completed Registration Form (attached to this letter) or provide your name, contact information, and interest in the matter, in writing, to the contact person below, by no later than 7 April 2015.

Where to obtain more information: To obtain additional information please contact the Environmental Assessment Practitioner at the details provided below.

Figure 28: Notification letter - Page 2



Environmental Assessment Practitioner:

Shangoni Management Services (Pty) Ltd

PO Box 74726, Lynnwood Ridge, Pretoria, 0040

Contact Person: **Lizette Crous**

Tel: 012 807 7036, Cell: 071 673 3355, Fax: 012 807 1014/086 643 5360,

E-mail: lizette@shangoni.co.za

For online participation go to www.shangoni.co.za and click on the “Public Documents” link.

Regards,



Lizette Crous

Shangoni Management Services

Figure 29: Notification letter - Page 3



4.3.2 Methods of Notification

4.3.2.1 Advertisement(s)

The proposed project was advertised in two local newspapers, the Beeld and the Pretoria West Rekord, on the 27th of February 2015. The Beeld and Pretoria West Rekord were found to be the most appropriate newspapers in terms of their accessibility to the I&APs. A copy of the advertisement and proof of the placement thereof is attached in Appendix D. Refer also to Figure 30 and Figure 31 below.

4.3.2.2 Placement of site- and public notices

Notice was also given to Interested and Affected Parties (I&APs) via the placement of notice boards. Notice boards were placed at five different, noticeable and conspicuous places on the 27th of February 2015. A copy of the site notice and photographs of the site notices are attached in Appendix D. Refer also to Figure 32 below.

4.3.2.3 Background Information Document

Notification letters and the Background Information Document (BID) for the proposed project provide background information pertaining to the project and are intended to inform I&APs of the project. The BID also includes a registration form which potential I&APs, stakeholders and organs of state are encouraged to complete in order to register as I&APs for the proposed project.

The Notification Letters and BID were made available to all landowners adjacent to the proposed site, as well as to all organs of state that may have jurisdiction over any aspect of the activity on the 24th of February 2015.

Copies of the notification letters and BID and proof of their distribution to the adjacent landowners and organs of state are attached under Appendix D. Proof of postage of the notification letters is given in Figure 33 below. Further proofs are also attached under Appendix D.



Vrydag 27 Februarie 2015 Beeld

Beeld Eienaar

REGKENNINGSWEGWIS & TENDERS

ADVERTENSIEBOERDE

KENNISGEWING
LANGEVEG 1100 EN BISSAL VLAAR...
TENDERS
DIE SKOONHEID VAN DIE NIEUW...
ADVERTENSIEBOERDE
DIE SKOONHEID VAN DIE NIEUW...

SAKELISENSIES

F & M BALANCE INVESTMENTS CC
KENNISGEWING
SAKELISENSIES
KENNISGEWING

BULLS EYE MEDIA CC
KENNISGEWING
SAKELISENSIES
KENNISGEWING

CONLEE MOTORS (PTY) LTD
KENNISGEWING
SAKELISENSIES
KENNISGEWING

MOI PETROLEUM (PTY) LTD
KENNISGEWING
SAKELISENSIES
KENNISGEWING

MOI PETROLEUM FEB 27 2015
KENNISGEWING
SAKELISENSIES
KENNISGEWING

MOI PETROLEUM FEB 27 2015
KENNISGEWING
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OIS OMGEWINGSIMPAKSTUDIE 4045

NOTICE OF WASTE MANAGEMENT LICENCE APPLICATION
PROPOSED KWAGGASRAND RECYCLING FACILITY UPGRADE PROJECT FOR NEW GX ENVIRO SOLUTIONS AND LOGISTICS HOLDINGS (PTY) LTD

PROPOSED KWAGGASRAND RECYCLING FACILITY UPGRADE PROJECT FOR NEW GX ENVIRO SOLUTIONS AND LOGISTICS HOLDINGS (PTY) LTD

PROPOSED KWAGGASRAND RECYCLING FACILITY UPGRADE PROJECT FOR NEW GX ENVIRO SOLUTIONS AND LOGISTICS HOLDINGS (PTY) LTD

PROPOSED KWAGGASRAND RECYCLING FACILITY UPGRADE PROJECT FOR NEW GX ENVIRO SOLUTIONS AND LOGISTICS HOLDINGS (PTY) LTD

Figure 30: Newspaper Advertisement - Beeld

PRETORIA WEST REKORD FRIDAY FEBRUAR

DEBT PROBLEMS? NO PROBLEM!!

- Emergency loans
- Consolidation finance
- Debt re-structuring

NOT DEBT REVIEW!!!

Isabel
in Capital Park
012 756 2306
074 207 9890
www.adsadr.com

0830 MANAGEMENT

Aanbevoelde Poste
Witjy 2015 begin? Ons is 'n Internasionale mpy wat uitbrei in PTA. Ons het needs suksesvolle takske in PTA en JHB.

ONS BENODIG
• 8 Senior Bestuurders
• 8 Junior Bestuurders
• 10 Jong Menske om opgelei te word as tak bestuurders (18-25)

ONS BIED
• Basies R18 000
• Medies, Huissubsidie
• Pensioen
• Groei en standvastigheid
• Volledige Opleiding
• Goede onderwys

Stuur CV na admin @pasuric.co.za
AM009074

0820 GENERAL

Data Entry COPY & PASTE. Access over 30000 companies that need YOU to submit forms. No qualification or experience needed. Step-by-Step instructions. Own hours. Registered company. For full info send your email & cell no. to opportunities @rotagroup.co.za

Has your telephone stopped ringing?

Epos jou cv na hr@mgmtraining.co.za
(Let Wel: Geen Kansvatters!!)

TIME TO ADVERTISE!

RF KORD
T: 0 12 842 0300
F: 86 540 9916

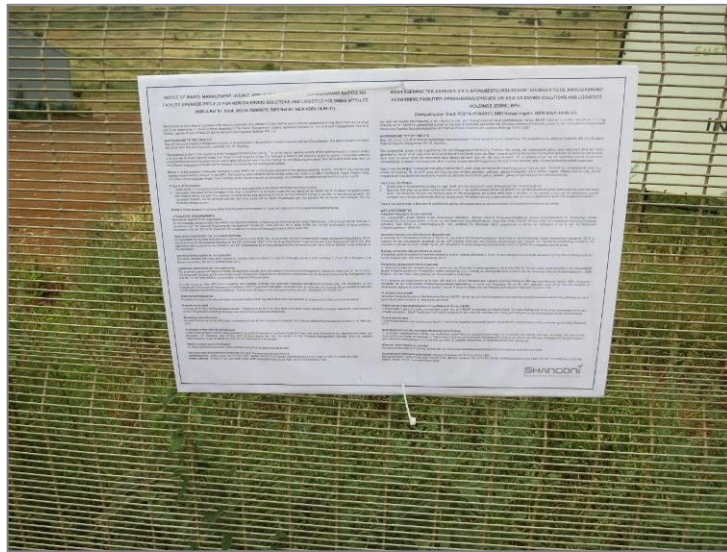
NOTICE OF WASTE MANAGEMENT LICENCE APPLICATION: PROPOSED KWAGGASRAND RECYCLING FACILITY UPGRADE PROJECT FOR NEW GX ENVIRO SOLUTIONS AND LOGISTICS HOLDINGS (PTY) LTD
(WMLA Ref Nr: Gaut: 002/14-15/W0015; SMS Ref Nr. NEW-KWA-14-09-11)

The purpose of this notice is to provide information to Interested and Affected Parties (I&APs) about potential decisions that may affect them and to afford I&APs an opportunity to influence those decisions in the Waste Management Licence application process for the proposed Kwaggasrand Recycling Facility Upgrade Project for New GX Enviro Solutions and Logistics Holdings (Pty) Ltd. **BACKGROUND TO THE PROJECT:** New GX Enviro is a waste management company that specialises in the provision of waste disposal and recycling solutions. The site is located on Portion 463 of the farm Pretoria Town and Townlands 351 JR, Gauteng. The proposed project is the upgrading of the Kwaggasrand Recycling Facility. The facility has an existing building where general waste is currently sorted and recycled by hand. General waste from Region 3 and Region 4 of the City Tshwane is taken to the recycling facility for sorting. Recyclable waste is collected from the incoming waste stream and is taken off site for sale or as raw material for manufacturing processes. Non-recyclable waste was taken to the adjacent Kwaggasrand landfill site for disposal, but this facility has subsequently closed. **Phase 1 of the project:** A Materials Recovery Facility (MRF) will be introduced adjacent to the existing recycling building. The MRF will optimise the existing manual sorting process. At the MRF, the following waste streams will be sorted, screened, baled or crushed: Cardboard; Paper; Plastic; Cans; and Glass. At the proposed Waste Tyre Crumbing Facility, waste tyres will be de-beaded, cut, shredded, screened and grinded into rubber crumbs. **Phase 2 of the project:** 1. Green waste: A composting facility will be set up on open land next to the above mentioned recycling building. 2. Wet waste: Wet waste will be managed in two ways at the facility. In the first process, the wet waste will be loaded into an in-vessel composter where the material will be aerated. The resultant compost will be sold and exhaust fumes will be extracted through a bio-filter. In the second process, the recyclable fractions will be removed and the remaining waste will be baled. Wastewater from this process will be treated and released into the municipal sewage system. **Phase 3 of the project:** A building rubble crushing plant will be erected on open land adjacent to the proposed composting facility. **LEGISLATIVE REQUIREMENTS: Procedure applied to the application:** As the proposed project entails new waste management activities, a Scoping and Environmental Impact Assessment (EIA) process will be required in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA) for the authorisation of listed activities contained in GN No. 921 of 29 November 2013 published in terms of Categories A and B of the NEM: WA. **Application submitted to the competent Authority:** An application for a Waste Management Licence in terms of the NEM: WA, as amended, and the Environmental Impact Assessment Regulations, 2010, was submitted for the proposed activities on the 30th of October 2014 to the Gauteng Department of Agriculture and Rural Development (GDARD). The application was accepted by the GDARD on the 20th of November 2014 and subsequently the reference number Gaut: 002/14-15/W0015 was assigned to the application. **Listed activities applicable to the application:** The listed activities that have been applied for include Listed activities 2, 3 and 12 of Category A and Listed activities 3, 6 and 10 of Category B of Government Notice No. 921 of 29 November 2013. **Legislation associated with the application:** The proposed project will require a Waste Management Licence under the National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM: WA). The associated Scoping and Environmental Impact Assessment Report will be compiled in accordance with the National Environmental Management Act (Act No. 107 of 1998) (NEMA), as amended, in support of this application. In order to do so, New GX Enviro Solutions and Logistics Holdings (Pty) Ltd has appointed Shangoni Management Services (Pty) Ltd (Shangoni) as the independent Environmental Assessment Practitioner (EAP) in terms of Regulation 16 of GNR 543, to undertake and manage the processes of applying for the required environmental authorisations. Furthermore, Shangoni manages the requirements set out in Regulation 17 of GNR 543. **PUBLIC PARTICIPATION:** People have a right to be informed about potential decisions that may affect them and to be afforded an opportunity to influence those decisions. Register as an I&AP: You may be an I&AP for this proposed project. To register as an I&AP of this project, or to obtain more information or submit comments, please request an I&AP Registration Form from Shangoni and return it to the details provided below. Availability of the draft Scoping Report: A draft Scoping Report will be made available to the public for review for a period of forty (40) days, and sixty (60) days for the Department of Water and Sanitation. An electronic copy of the draft Scoping Report will also be posted on the Shangoni Management Services (Pty) Ltd website (www.shangoni.co.za) for public comment for the same period of forty days. **Where to obtain more information:** To obtain additional information, please contact the EAP at the details provided below. **Environmental Assessment Practitioner:** Shangoni Management Services (Pty) Ltd
Contact person: Lizette Cross
Tel: 012 807 7036; **Mobile:** 071 673 3355; **Email:** lizette@shangoni.co.za;
Fax: 012 807 1014/086 643 5360;
Postal Address: PO Box 74726, Lynnwood Ridge, 0040

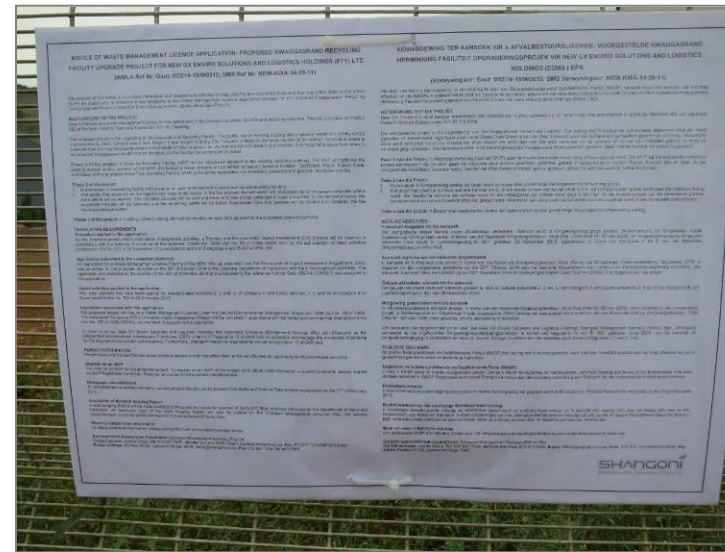
Figure 31: Newspaper Advertisement - Pretoria West Rekord



AB006813



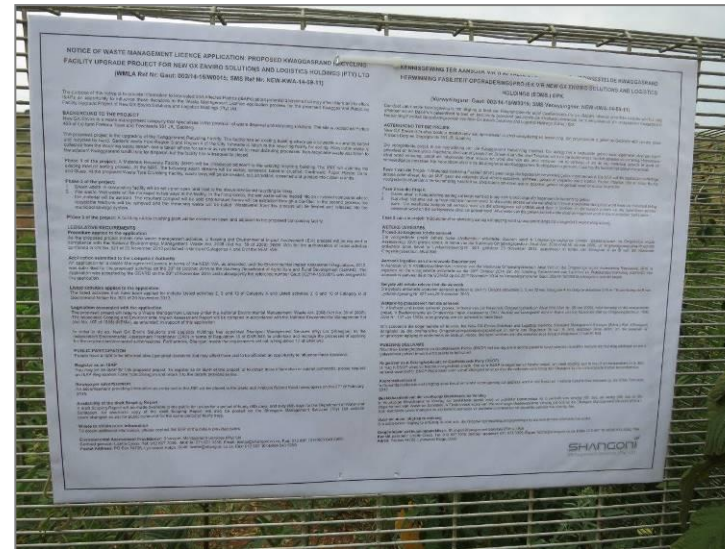
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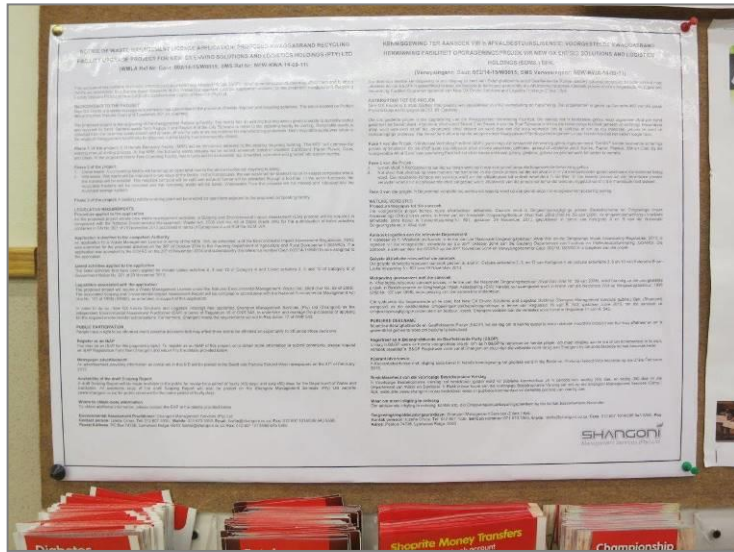


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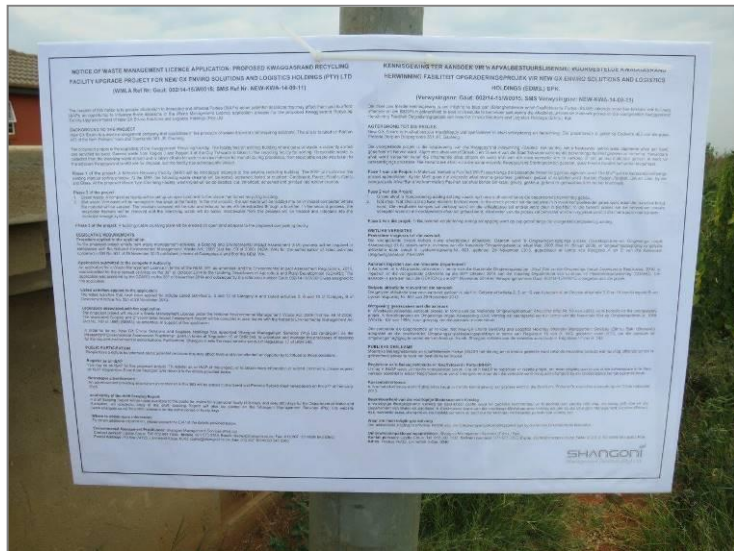




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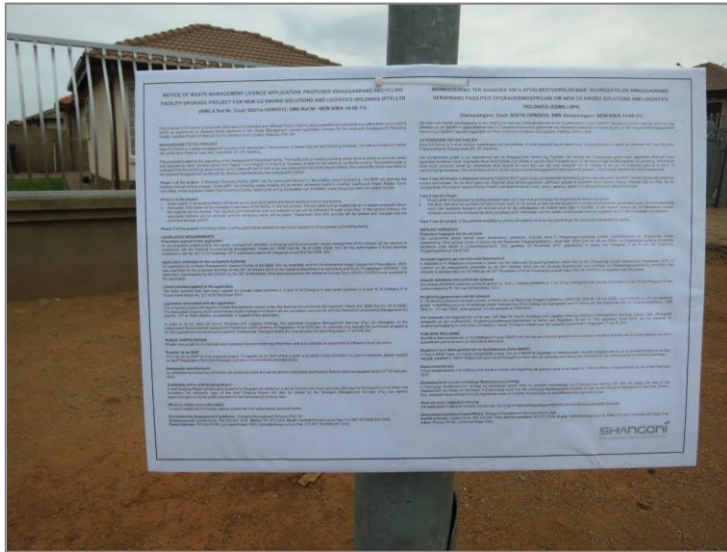


g



h





i



j

Figure 32(a-j): Placement of Site Notices



List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
 (with an insurance option/met 'n versekeringsopsie)



Full tracking and tracing/Volledige volg en spoor

Name and address of sender:
 Naam en adres van afsender: Shangoni Management Services (Pty) Ltd
P.O. Box 74726 Lynnwood Ridge 0040

Enquiries/Navrae
 Sharecall
 number/nummer
0860 111 502
 www.postoffice.co.za

No	Name and address of addressee Naam en adres van geadreeseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor-Klientafskrif
1	City of Tshwane Metropolitan Municipality PO Box 62440 Marshalltown 2107 Adelaide Morgezi/Adelaide Morgezi					REGISTERED LETTER RD 976 476 580 Z.A. CUSTOMER COPY 301022R
2	City of Tshwane Metropolitan Municipality PO Box 4001 Marshalltown 2107 Mr B. Nkomo					REGISTERED LETTER RD 976 476 576 Z.A. CUSTOMER COPY 301022R
3	City of Tshwane Metropolitan Municipality PO Box 4001 Marshalltown 2107 Ms Phisothe Mzantsiwa					REGISTERED LETTER RD 976 476 735 Z.A. CUSTOMER COPY 301022R
4	City of Tshwane Metropolitan Municipality PO Box 4112 Marshalltown 2107 Mr John Selezi					REGISTERED LETTER RD 976 476 749 Z.A. CUSTOMER COPY 301022R
5	City of Tshwane Metropolitan Municipality PO Box 4065 Marshalltown 2107 Dr Hugh Gubane					REGISTERED LETTER RD 976 476 718 Z.A. CUSTOMER COPY 301022R
6	City of Tshwane Metropolitan Municipality PO Box 4065 Marshalltown 2107 Ms T. Mankwa and Ms T. Lengola					REGISTERED LETTER RD 976 476 721 Z.A. CUSTOMER COPY 301022R
7	City of Tshwane Metropolitan Municipality PO Box 4001 Marshalltown 2107 Mr B. Nkomo					REGISTERED LETTER RD 976 476 695 Z.A. CUSTOMER COPY 301022R
8	City of Tshwane Metropolitan Municipality PO Box 10350 Mamelodi 0107 Mr Kellian Masinga					REGISTERED LETTER RD 976 476 704 Z.A. CUSTOMER COPY 301022R
9	City of Tshwane Metropolitan Municipality PO Box 4001 Marshalltown 2107 Mr Ronald Swartz/Leandrie Mkhabela					REGISTERED LETTER RD 976 476 783 Z.A. CUSTOMER COPY 301022R
10	City of Tshwane Metropolitan Municipality PO Box 435 Johannesburg 2000 Ms Shabi Tshabalala					REGISTERED LETTER RD 976 476 766 Z.A. CUSTOMER COPY 301022R
	Total	R	R	R	R	

Number of letters posted (10)
 Getal briewe gepos

Signature of client
 Handtekening van klient: A. Plessis

Signature of accepting officer
 Handtekening van aanneembeampte: [Signature]

Date stamp

 Datumstempel

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance of up to R200.00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering van tot R200.00 is beskikbaar en is slegs binne landse geregistreerde briewe van toepassing.

List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
 (with an insurance option/met 'n versekeringsopsie)



Full tracking and tracing/Volledige volg en spoor

Name and address of sender:
 Naam en adres van afsender: Shangoni Management Services (Pty) Ltd
P.O. Box 74726 Lynnwood Ridge 0040

Enquiries/Navrae
 Sharecall
 number/nummer
0860 111 502
 www.postoffice.co.za

No	Name and address of addressee Naam en adres van geadreeseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor-Klientafskrif
1	City of Tshwane Metropolitan Municipality PO Box 2242 Pretoria 0001 Ntsako Hobanzi					REGISTERED LETTER RD 976 476 678 Z.A. CUSTOMER COPY 301022R
2	City of Tshwane Metropolitan Municipality PO Box 6338 Pretoria 0001 Cnr Dene Jacobs Swenepoel					REGISTERED LETTER RD 976 476 681 Z.A. CUSTOMER COPY 301022R
3	City of Tshwane Metropolitan Municipality PO Box 440 Pretoria 0001 Cnr Dene Jacobs Swenepoel					REGISTERED LETTER RD 976 476 655 Z.A. CUSTOMER COPY 301022R
4	City of Tshwane Metropolitan Municipality PO Box 440 Pretoria 0001 Cnr Fanie Maredi					REGISTERED LETTER RD 976 476 664 Z.A. CUSTOMER COPY 301022R
5	City of Tshwane Metropolitan Municipality PO Box 6338 Pretoria 0001 Cnr Fanie Maredi					REGISTERED LETTER RD 976 476 647 Z.A. CUSTOMER COPY 301022R
6	City of Tshwane Metropolitan Municipality PO Box 6338 Pretoria 0001 Cnr Essop Mankwani					REGISTERED LETTER RD 976 476 633 Z.A. CUSTOMER COPY 301022R
7	City of Tshwane Metropolitan Municipality PO Box 440 Pretoria 0001 Cnr Essop Mankwani					REGISTERED LETTER RD 976 476 616 Z.A. CUSTOMER COPY 301022R
8	City of Tshwane Metropolitan Municipality PO Box 493 Pretoria 0001 Mkhosi Koko					REGISTERED LETTER RD 976 476 620 Z.A. CUSTOMER COPY 301022R
9	City of Tshwane Metropolitan Municipality PO Box 440 Pretoria 0001 Dorah Ntso					REGISTERED LETTER RD 976 476 593 Z.A. CUSTOMER COPY 301022R
10	Department of Water and Sanitation - Catchment R23D PO Box 4313 Pretoria 0001 Sundara Lihan					REGISTERED LETTER RD 976 476 602 Z.A. CUSTOMER COPY 301022R
	Total	R	R	R	R	

Number of letters posted (10)
 Getal briewe gepos

Signature of client
 Handtekening van klient: A. Plessis

Signature of accepting officer
 Handtekening van aanneembeampte: [Signature]

Date stamp

 Datumstempel


The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance of up to R200.00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering van tot R200.00 is beskikbaar en is slegs binne landse geregistreerde briewe van toepassing.

List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
 (with an insurance option/met 'n versekeringsopsie)

Full tracking and tracing/Volledige volg en spoor

Name and address of sender:
 Naam en adres van afsender: Shangoni Management Services (Pty) Ltd
PO Box 74726 Lynnwood Ridge 0040



Post Office
 Enquiries/Navrae
 Sharecall
 number/nommer
0860 111 502
www.postoffice.co.za

No	Name and address of addressee Naam en adres van geadreeseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Postgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor-Kliëntafskrif
1	<u>Coating Finishing Agency</u> <u>PO Box 66106 Benmore 2010</u> <u>rv Oupa seaba</u>					REGISTERED LETTER (with an insurance option) ShareCall 0860 111 502 www.postoffice.co.za RD 976 476 752 ZA CUSTOMER COPY 304038R
2						
3						
4						
5						
6						
7						
8						
9						
10						
Number of letters posted Getal briewe gepos		Total Totaal		R	R	R

Signature of client
Handtekening van kliënt: *K. Plessis*

Signature of accepting officer
Handtekening van aanneembeampte: *[Signature]*

Date stamp
Datumstempel



Datumstempel

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance of up to R200.00 is available and applies to domestic registered letters only.
 Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering van tot R2 000.00 is beskikbaar en is slegs binne-landse geregistreerde briewe van toepassing.

701248

Figure 33: Proof of postage of notification letters

4.3.3 I&AP register

Once all adjacent landowners, organs of state and the public were notified of the proposed project, an I&AP Register (also provided in Appendix D) was compiled. The table below provides an extract of the I&AP Register indicating the organs of state and other I&APs that have been registered.

Table 16: Registered I&APs

No.	Name	Department
Organs of State		
1.	Mr Killian Mwiinga	Gauteng Department of Local Government and Housing
2.	Advocate Mongezi Tshongweni	Gauteng Department of Community Safety
3.	Ms Phindile Mbanjwa	Gauteng Department of Economic Development
4.	HOD	Gauteng Department of Finance
5.	Dr Hugh Gosnell	Gauteng Department of Health
6.	Mr B. Netshiswinzhe	Gauteng Department of Infrastructure Development
7.	Mr Ronald Swartz	Gauteng Department of Roads and Transport
8.	Ms Y. Malaza and Ms T. Lengolo	Gauteng Department of Human Settlements
9.	Mr B. Nkontawa	Gauteng Department of Co-operative Governance and Traditional Affairs
10.	Siwelane Lilian	Department of Water and Sanitation
11.	Dorah Nteo	City of Tshwane Metropolitan Municipality (CTMM)
12.	Kemmone Mofela	City of Tshwane Metropolitan Municipality (CTMM) – Environmental Planning and Open Space Management
13.	Mthobeli Kolisa	City of Tshwane Metropolitan Municipality (CTMM) – Waste Management
14.	Ntsako Hobyani	City of Tshwane Metropolitan Municipality (CTMM) – Planning
15.	Cllr Danie Jacobs Swanepoel	City of Tshwane Metropolitan Municipality (CTMM) – Ward 3
16.	Cllr Francina Maredi	City of Tshwane Metropolitan Municipality (CTMM) – Ward 51
17.	Cllr Essop Mahomed	City of Tshwane Metropolitan Municipality (CTMM) – Ward 61
18.	Nokukhanya Khumalo	South African Heritage Resources Agency
No.	Name	Interest
Registered I&APs		
1.	Cllr Danie Jacobs Swanepoel	City of Tshwane Metropolitan Municipality (CTMM) – Ward 3

Refer also to Appendix D for a detailed I&AP Register including contact information for all registered organs of state and I&APs.

4.3.4 Public meeting(s)

No public meetings have been held nor is one anticipated at this stage.



4.3.5 Access and opportunity to comment on written submissions

Draft Scoping Report

The draft Scoping Report was made available to Interested and Affected parties and key stakeholders for review for a period of forty (40) days from the 26th of May 2015 to the 13th of July 2015, and sixty (60) days for the Department of Water and Sanitation from the 26th of May 2015 to the 3rd of August 2015. An electronic copy of the draft Scoping Report was also posted on Shangoni Management Services' website (www.shangoni.co.za) for public comment for the same period of forty days. The draft Scoping Report was also submitted to the Gauteng Department of Agriculture and Rural Development on the 20th of May 2015 to obtain their comments.

Draft Environmental Impact Assessment Report

Similar to the Scoping Report, the draft EIR and EMP will be made available to the public for review for a period of forty (40) days. An electronic copy of the draft EIR and EMP will also be posted on the Shangoni Management Services' website (www.shangoni.co.za) for public comment for the same review period of forty days.

4.3.6 Consultation with the relevant Authorities

4.3.6.1 Application form in terms of the NEM:WA, 2008

The applicable Waste Management Licence application form under NEM: WA, 2008, was submitted to the Gauteng Department of Agriculture and Rural Development (GDARD) on the 30th of October 2014. A reference number (Gaut: 002/14-15/W0015) was issued by GDARD on the 20th of November 2014. The letter of acknowledgement indicating the above mentioned reference number is attached as Appendix F.

4.3.6.2 Authorities meeting(s)

No meetings have been held with any of the competent authorities nor are such meetings anticipated at present.

4.3.7 Further consultation with relevant Authorities

A letter was received from the Gauteng Department of Agriculture and Rural Development in response to the draft Scoping Report that Shangoni submitted to the Department for this proposed project. The following table provides the comments from the GDARD and indicates how Shangoni has addressed each comment in this final Scoping Report.

Comments from GDARD	How each comment has been addressed in this final Scoping Report
ACKNOWLEDGEMENT LETTER OF DRAFT SCOPING REPORT: WASTE MANAGEMENT LICENCE FOR THE PROPOSED KWAGGASRAND	1. and 2. Activity 3 of Category B of GN 921 of 29 November 2013 has been removed from the Waste Management Licence application for this

Comments from GDARD	How each comment has been addressed in this final Scoping Report
<p>RECYCLING FACILITY UPGRADE PROJECT FOR NEW GX ENVIRO SOLUTIONS AND LOGISTICS HOLDINGS (PTY) LTD, LOCATED ON PORTION 463 OF THE FARM PRETORIA TOWN AND TOWNLANDS 351 JR, CITY OF TSHWANE METROPOLITAN MUNICIPALITY</p> <p>The above-mentioned matter has reference.</p> <p>The Department hereby acknowledges receipt of the above-mentioned draft Scoping Report and amended waste management licence application form dated 19 May 2015, received by the Department on the 20th of May 2015.</p> <p>The Department has reviewed the above-mentioned Scoping Report and has the following comments:</p> <ol style="list-style-type: none"> 1. It was noted that in the amended waste management licence application form, the activities applied for include Category B Activity 3 of Government Notice number 921, 2013 which is for the recovery of waste. However the description of what exactly the applicant will be doing on site does not read with the definition of recovery as per the National Environmental Management Waste Act No. 59 of 2008 (NEMWA). 2. In terms on NEMWA the word recovery means <i>“the controlled extraction of a material or the retrieval of energy from waste produce a product.”</i> Based on the definition of recovery it is recommended that the Category B Activity 3 be removed for the proposed project under the activities applied for. The description of Category B Activity 10 must also be amended since the proposed project does not include the recovery of waste. 3. It was also noted that the Interested and Affected Parties were notified about this project and initial comments received were responded to and 	<p>project. An amended Waste Management Licence application form has been attached to this final Scoping Report. The activity has also been removed from Table 4 of this report. The description of Activity 10 of Category B has also been changed in the application form and Table 4 by removing the reference to “recovery”.</p> <ol style="list-style-type: none"> 3. Additional comments that were received from Interested and Affected Parties have been included in the Comments and Responses Report for this project, given as Table 17 in this report and also attached under Appendix D. 4. A Phase 1 Heritage Impact Assessment and Palaeontological Assessment has been completed for this proposed project. The reports have also been uploaded onto the SAHRIS website.



Comments from GDARD	How each comment has been addressed in this final Scoping Report
<p>included in this report. It is recommended that additional comments be incorporated with the initial comments when received and form part of the final Scoping Report.</p> <p>4. The Department recommend that the comments from SAHRA be attended to as it was committed to you on your response that a Heritage Impact Assessment and Paleontological Impact Assessment Survey will be conducted for this project and uploaded onto SAHRA as soon as the studies have been completed.</p> <p>Should you have any enquiries regarding the content of this letter, please contact Ms. Cynthia Chabalala on the telephone number given above.</p>	

4.3.8 Comments and Responses

All issues, comments and questions received from I&APs thus far have been summarised in the table below. Copies of the comments received have also been included in Appendix D.



Table 17: Comments and responses

Name of contact person	Company	Date	Method of comment	Issue raised	Response
Danie Swanepoel	City of Tshwane – Ward 3	15-03-2015	E-mail	<p>Hi Lizette,</p> <p>Thank you for sending me the notice regarding the application for the waste management Licence.</p> <p>Please keep me informed as a affected party.</p> <p>Could you also tell me if there is a steering committee or something in that line setup?</p>	<p>Initial Response</p> <p>Your e-mail received on the 15th of March 2015 refers: We hereby confirm that you have been registered as an Interested and Affected Party for the Kwaggasrand Recycling Facility Upgrade Project. You will henceforth receive all correspondence regarding public participation opportunities as the process unfolds.</p> <p>We also take note of your comments. They will be included and addressed in the subsequent reports for this project.</p> <p>Second Response</p> <p>Your enquiry, dated 15 March 2015, refers: There is no Steering Committee or similar entity for this project.</p>
Nokukhanya Khumalo	South African Heritage Resources Agency	12-05-2015	SAHRIS website	<p>Response to NID (Notification of Intent to Develop) In terms of Section 38(2) of the National Heritage Resources Act (Act 25 of 1999)</p> <p>New GX Enviro is a waste management company that specialises in the provision of waste disposal and recycling solutions.</p> <p>New GX Enviro proposes to construct a waste disposal facility on Portion 463 of the farm Pretoria Town and Townlands 351 JR, City of Tshwane Municipality, Gauteng Province. The proposed development will consist of upgrading the existing Kwaggasrand Recycling Facility. Phase 1 of the project will be the construction of mechanical sorting machine and a tyre crumbing facility. Phase 2 of the project will be the construction of a composting facility and wet waste facility. The 3rd Phase will be for the construction of building rubble.</p> <p>In terms of the National Heritage Resources Act (NHRA), no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. This means that before such sites are disturbed by development it is incumbent on the developer (or mine) to ensure that a Heritage Impact Assessment is done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites that are to be destroyed, must be done as required.</p> <p>No Heritage Impact Assessment was uploaded to this case. Nor a Palaeontological Impact Assessment was uploaded to the case on SAHRIS.</p> <p>SAHRA Notification of Development comment</p> <p>SAHRA APM Unit requires a Heritage Impact Assessment study conducted by a suitably qualified professional archaeologist for the proposed development. The assessment should look at the built environment, graves, and archaeology of the proposed development.</p> <p>The proposed development lies in a High to Very High palaeontological sensitive zone (http://www.sahra.org.za/sahris/map/palaeo), thus SAHRA APM unit will require a Desktop Palaeontological Impact</p>	<p>Initial Response</p> <p>We hereby acknowledge receipt of your comments on the proposed Kwaggasrand Recycling Facility upgrade project.</p> <p>A Heritage Impact Assessment and Palaeontological Impact Assessment Survey will be conducted for this project and uploaded onto SAHRIS as soon as the studies have been completed.</p> <p>The project site is correctly mapped on the SAHRIS map for this case, as shown in the image below.</p>  <p>Second Response</p> <p>A Heritage Impact Assessment and Palaeontological Impact Assessment Survey have been conducted for the proposed project. These studies will be uploaded onto SAHRIS in due course.</p> <p>Third Response</p> <p>The Heritage Impact Assessment and Palaeontological Impact</p>

Name of contact person	Company	Date	Method of comment	Issue raised	Response
				<p>Assessment Survey for this proposed development also conducted by a suitably qualified professional palaeontologist.</p> <p>SAHRA will comment further on this proposed development once the above requested studies are submitted to the case. Also the project is incorrectly mapped on the SAHRIS map, before further comment is made to the case, the project area extent must be mapped out exactly on the SAHRIS map, using a polygon tool and not the dot that is currently on the SAHRIS map for this project.</p>	Assessment Survey reports have been uploaded onto SAHRIS.
Kemmone Mofela	City of Tshwane – Environmental Planning and Open Space Management	19-06-2015	Email	<p>Dear Madam/Sir,</p> <p>DRAFT SCOPING REPORT FOR THE WASTE MANAGEMENT LICENCE FOR THE PROPOSED UPGRADING OF THE KWAGGASRAND RECYCLING FACILITY ON PART OF PORTION 463 OF THE FARM PRETORIA TOWN AND TOWNLANDS 351, GAUTENG PROVINCE</p> <p>Your Report dated 01 June 2015 refers,</p> <p>1. INTRODUCTION</p> <p>The Environmental Management Services Department (the Department) has considered the Draft Scoping Report in respect of the above-mentioned application. The Draft Scoping Report is submitted to the Environmental Management Services Department of the City of Tshwane, hereafter referred to as “the City”, as a commenting authority in terms of the National Environmental Management Act (NEMA) and EIA Regulations of August 2010.</p> <p>2. PROJECT LOCATION AND DESCRIPTION</p> <p>Shangoni Management Services Pty (Ltd) has been appointed by New GX Enviro Solutions and Logistics (Pty) Ltd as an independent Environmental Assessment Practitioner (EAP) to undertake the environmental assessment towards acquiring the Water Management License for waste management activities associated with the proposed upgrading of the Kwaggasrand Recycling Facility on the part of Portion 463 of the farm Pretoria Town and Townlands 351-JR, Gauteng Province. The study site is bordered by the existing Kwaggasrand landfill site on the east, Kwaggasrand ridge on the south and Atteridgeville Township in the north. The total extent of the property is 12.8165 Ha.</p> <p>The proposed upgrade of the waste recycling facility will commence in three phases and will cater for the processing of approximately 1 521.5 tons per day consisting of waste materials such as cardboard, paper, plastics, cans, glass, green waste, wet waste, building rubble and waste tyres.</p> <p>Phase 1A (2.35Ha): Materials Recovery Facility (MRF) will be introduced adjacent to the existing recycling building. The MRF will sort mixed waste into separate waste streams/fractions through a combination of automated and manual processes. The installation of MRF, however, does not form part of the Waste Management License Application.</p> <p>Phase 1B (1.68Ha): Construction of the Waste Transfer Station (west of the recycling facility) to increase the throughput capacity of the existing recycling facility to approximately 54.6 tons per day consisting of paper, cardboard, glass and cans. This station will include a docking/parking area for the dumping of waste and refuse loads, a waste and refuse storage area, staff canteen and ablution facilities.</p> <p>Phase 2 (2.10Ha): Construction of the Composting facility aimed shredding or mulching the green waste as garden refuse and</p>	<p>We hereby acknowledge receipt of your comments on the proposed Kwaggasrand Recycling Facility upgrade project. Your comments are noted and thank you for your inputs.</p> <p>Herewith please find our response to the recommendations given in your letter:</p> <ol style="list-style-type: none"> A Site Development Plan will be compiled and included in the Environmental Impact Assessment Reports for this project. A Layout Plan will be compiled and included in the Environmental Impact Assessment Reports for this project. The specialist studies identified in the Scoping Report will be conducted and included in the Environmental Impact Assessment Reports for this project. The potential impacts of the proposed development will be included in the Environmental Impact Assessment Reports and mitigation measures will be recommended to address the impacts. A service report will be sought and included in the Environmental Impact Assessment Reports for this project. The Landscape Development Plan will be included in the Environmental Impact Assessment Reports for this project. A Geotechnical Investigation has been conducted for Phase 1A of the project. This study will be updated for the remaining development site and the study will be included in the Environmental Impact Assessment Reports for this project. A draft Environmental Management Programme will form part of the Environmental Impact Assessment Report for this project. The Stormwater Management Plan will be included in the Environmental Impact Assessment Reports for this project. The municipality is requested to please verify whether they are requesting that a Traffic Impact Assessment be conducted for the proposed project. This was not initially suggested, as indicated in the municipality’s letter, and there was also no recommendation for such an assessment from a noise impact specialist. Comments from the Traffic and Infrastructure Planning



Name of contact person	Company	Date	Method of comment	Issue raised	Response
				<p>sports field & park maintenance waste.</p> <p>Phase 3 (1Ha): construction of the Waste Tyre Crumbling facility as well as of the Building Rubble Crushing Plant west of the proposed composting facility. The crushed building material will be distributed as foundation and filling material for local construction projects.</p> <p>The proposed application site falls within the area of jurisdiction of the City of Tshwane Metropolitan Municipality.</p> <p>The activity entails undertaking the following listed activity under Government Notice 921 in Government Gazette 37083 dated 29 November 2013 in terms of Section 19(2) of the National Environmental Management : Waste Act, 2008 (Act No. 59 of 2008), - List of waste management activities that have, or likely to have a detrimental effect on the environment-</p> <p>Category A Activity 2, 3 & 12 Category B Activity 3, 6 & 10</p> <p>3. KEY FACTORS INFORMING THE COMMENTS In making comments in respect of the proposed Activity the Department has taken, <i>inter alia</i>, the following into consideration:</p> <p>a) The following information contained in the Draft Basic Assessment Report dated 1 June 2015 and received by the Department on 09 June 2015.</p> <p>b) Information obtained from the Section's information base including <i>inter alia</i>:</p> <ul style="list-style-type: none"> • Geographic Information System (GIS); and • Gauteng Open Space Plan (GOSP). <p>c) Compliance with applicable Municipal, Provincial, and National Policies and Guidelines including:</p> <ul style="list-style-type: none"> • The National Environmental Management Act 1998 (Act 107 of 1998) (NEMA): its decision-making principles and Environmental Impact Assessment Regulations; • The Tshwane Integrated Environmental Policy (TIEP); • The Tshwane Open Space Framework (TOSF); and • The Bioregional Plan for the Gauteng Metropolitan Municipalities. <p>4. DISCUSSION In reviewing the application the Department made the following findings:</p> <p>a) According to the Tshwane Open Space Framework, the proposed development site is situated within and in close proximity to the following open spaces typologies:</p> <ul style="list-style-type: none"> • A Green Way, namely class 2 Schubeberg Mountain range Green ways consist of ridge systems. Such ridges are defined as areas steeper than 5 degrees in which ecological systems processes and values are concentrated. Green Ways also represent important habitats for fauna- and flora, areas representative of local biomes, vegetation types and high ecological sensitivity as well as areas of linkage and connectivity. <p>b) According to the GDARD C-Plan version 3, the southern edge of the proposed development site is situated on a Important</p>	<p>Department will be sought and included in the Environmental Impact Assessment Reports for this project, if received.</p> <p>Second Response</p> <p>a) A Site Development Plan has been compiled and included in the Environmental Impact Assessment Reports for this project.</p> <p>b) A Layout Plan has been compiled and included in the Environmental Impact Assessment Reports for this project.</p> <p>c) The specialist studies identified in the Scoping Report have been conducted and included in the Environmental Impact Assessment Reports for this project. The potential impacts of the proposed development have been included in the Environmental Impact Assessment Reports and mitigation measures have been recommended to address the impacts.</p> <p>d) A service report will be sought and provided as soon as received.</p> <p>e) The Landscape Development Plans will be finalised as part of the Building Plan Approval process at the City of Tshwane Metropolitan Municipality. An example of a Landscape Development Plan (the plan compiled for Phase 1A of the project) is attached under Appendix C of the Environmental Impact Assessment Report for this project.</p> <p>f) A Geotechnical Investigation has been conducted for Phase 1A of the project. This study has been updated for the remaining development site and the study has been included in the Environmental Impact Assessment Reports for this project.</p> <p>g) A draft Environmental Management Programme forms part of the Environmental Impact Assessment Report for this project.</p> <p>h) The Stormwater Management Plan has been included in the Environmental Impact Assessment Reports for this project.</p> <p>i) The municipality is requested to please verify whether they are requesting that a Traffic Impact Assessment be conducted for the proposed project. This was not initially suggested, as indicated in the municipality's letter, and there was also no recommendation for such an assessment from a noise impact specialist.</p> <p>j) Comments from the Traffic and Infrastructure Planning Department will be sought and included in the Environmental Impact Assessment Reports for this project, if received.</p>



Name of contact person	Company	Date	Method of comment	Issue raised	Response
				<p>and Ecological Support Area. However it is noted that this is due to the proximity of the site with the 2 Schuverberg Mountain range.</p> <p>c) According to the Bioregional Plan for the Gauteng Metropolitan Municipalities the proposed site is situated within the following areas:</p> <ul style="list-style-type: none"> • Critical Biodiversity Area 1: Critical Biodiversity Area 1 implies that the area is either natural or near natural terrestrial or aquatic to meet biodiversity pattern and/or thresholds. Critical Biodiversity Area One must obtain formal conservation protection where possible to avoid net loss of intact habitat or intensification of land-use. • Ecological Support Areas 1: Supporting zone required to prevent degradation of Critical Biodiversity Areas and Protected Areas. These include remaining corridor, catchment wetland and other process areas that are required to prevent degradation of Critical Biodiversity Areas and formal Protected Areas; and areas which could otherwise have been identified as Critical Biodiversity Areas except that have been transformed or degraded, but which are currently or potentially still important for supporting ecological processes e.g. floodplain areas that have transformed or degraded. These areas are a focus for rehabilitation rather than the intensification of land uses. • No Natural Areas Remaining: These areas include cultivated areas (intensive agriculture), plantations, mined areas, urban areas, infrastructure and dams • Other Natural Areas <p>d) According to the report, the proposed development site is situated on the Vulnerable Gauteng Shale Mountain Bushveld vegetation unit and less than 1% of the targeted 24% has been conserved inside four nature reserves as informed by Mucina & Rutherford (2006).</p> <p>e) The proposed development site is in close proximity to the Critical Biodiversity Area as informed by the Bioregional Plan for the Gauteng Metropolitan Municipalities (2011). This is due to the fact that the proposed development site is on the foot of the ridge.</p> <p>f) The Tshwane GIS map shows the proposed development site situated on soils with very low to no agricultural potential as informed by Gauteng Agricultural Potential Atlas (GAPA3).</p> <p>g) According to the report, the soils found on the proposed development site are classified as S16 which refers to non-soil land class and may be water-intake area.</p> <p>h) During site meeting on 12 June 2015, the hardened compacted-loamy soil which is not easily erodible and permeable was observed.</p> <p>i) The report indicates that seepage water from the proposed composting windrows will be collected into a retention pond or sump and reused to moisten the windrows.</p> <p>j) The report indicates that the proposed development site slopes downwards from west to east.</p> <p>k) During the consultation meeting held on 12 June 2015, Lizette Crous mentioned that potential erosion will be managed by</p>	



Name of contact person	Company	Date	Method of comment	Issue raised	Response
				<p>channelling water through the proposed retention ponds.</p> <p>l) According to the report, the domestic waste will be aerated into a compost to be sold and the exhaust fumes extracted through a bio-filter. The non-recyclable fraction will be baled and taken-off to landfill sites or waste-to-energy facilities.</p> <p>m) The report indicates that the waste water extracting from the baled waste will be treated and released into the municipal sewage system.</p> <p>n) The waste tyres will be processed into rubber crumbs which will be used elsewhere in road tarmac, rubber products, agriculture and reclaimed rubber processes as indicated in the report.</p> <p>o) The report indicates that the proposed development site is zoned Industrial 1. The development is proposed west of the closed Kwaggasrand landfill site.</p> <p>p) The manual sorting operations on the existing Kwaggasrand Recycling Facility were halted since 01 December 2013 due to unavailability of airspace on the facility as indicated in the report.</p> <p>q) The report indicates that water will be sourced from the existing municipal system.</p> <p>r) The report indicates that a fractured (B3) aquifer with median borehole yields of 0.5-2 litres/second is located on the proposed development site as informed by Geo-hydrological Map Sheet 2526 (1999).</p> <p>s) The water table is 14 meters above ground level (DWAF, 2010) as indicated in the report.</p> <p>t) During the consultation meeting on 12 June 2015, Lourens de Villiers indicated that the stormwater emanating from the proposed development will be channelled towards the existing municipal storm water system along the Maunde Street.</p> <p>u) According to the report, two small shallow wetlands are located 508 and 1015 metres, respectively southeast of the proposed development site.</p> <p>v) According to the report, the proposed development has been previously disturbed and there is no information concerning the absence or presence of any sites of cultural heritage.</p> <p>w) Response letter from the South African Heritage Recourses Agency (SAHRA) indicates that the proposed development site is situated in a high to very high paleontological sensitive zone.</p> <p>x) The South African Heritage Recourses Agency (SAHRA) recommended that the Heritage Impact Assessment and Desktop Paleontological Impact Assessment Survey should be conducted as indicated in the response letter.</p> <p>y) According to the report, the proposed development site is located outside an Air shed Priority Area.</p> <p>z) In response to the potential smell from the proposed development, Lourens de Villiers emphasized that the issue will be</p>	



Name of contact person	Company	Date	Method of comment	Issue raised	Response
				<p>controlled by storing the waste inside containers.</p> <p>aa) The proposed development has a potential visual impact to the motorists using the Maunde Street and a Landscape Development Plan is being compiled as indicated in the report.</p> <p>bb) The following identified specialist studies will be compiled and included in the EIA</p> <ul style="list-style-type: none"> • Vegetation Assessment • Stormwater Management Plan • Heritage Impact Assessment • Paleontological Impact Assessment • Environmental Management Programme (EMPr) <p>5. RECOMMENDATIONS</p> <p>In light of the above, the Department request that the following be effected:</p> <p>a) A legible Site Development Plan of the proposed development should be designed and included in the report.</p> <p>b) A layout plan showing the proposed development superimposed on the environmental sensitivities found on the proposed development site should be designed and included in the draft EIA report.</p> <p>c) All identified specialists reports must be conducted and included in the EIA report. The assessment report must include all potential impacts of the proposed development and appropriate mitigation measures.</p> <p>d) Service report (water electricity, stormwater and sewage) from relevant service providers must be included in the assessment report.</p> <p>e) The Landscape development to be designed should include, amongst others, landscaping that conceal the visual impact the proposed development will impose onto the neighbouring bonded housing and road users.</p> <p>f) A detailed Stability and Geotechnical Investigation report should be conducted and included in the Final Basic Assessment report. The report should confirm the stability of the geology and soil profile as well as groundwater levels on the proposed development site.</p> <p>g) The EMPr consisting of recommendations and mitigation measures from all the specialist studies should be included in the draft EIA report.</p> <p>h) The Stormwater Management Plan should consist of both the report and the design layout plan and be attached in the draft EIA report.</p> <p>i) A detailed Traffic Impact Assessment report should be conducted and included in the final EIA report as initially suggested and as recommended by the noise impact specialist. The report should aim to determine impacts related to traffic flow and traffic pressure handling capacity.</p> <p>j) Comments from Traffic and Infrastructure Planning should be sought and included in the draft EIA report.</p> <p>6. CONCLUSION</p> <p>The above recommendations should be considered and included within the EIA report.</p> <p>The Department will deliver final comments upon the receipt of the draft EIA, with inclusion of the above recommendations.</p>	



4.3.9 Conclusions of the PPP

In conclusion, the Public Participation exercise has provided adequate information to enable an understanding of what the proposed project would entail and to address the concerns and comments received during the EIA process thus far.



5. NEED AND DESIRABILITY FOR THE ACTIVITY

A need and desirability for this project is evident from the following perspectives:

5.1 Developer/Applicant

The proposed project will generate a source of income for the applicant, New GX Enviro Solutions and Logistics Holdings, and is therefore desirable from an economic point of view. The revenue will originate from the sale of recyclable material to manufacturers for use in their respective production processes. This includes the sale of cardboard, paper, plastic, cans and glass. Rubber crumbs from the waste tyre crumbing facility will be sold for re-use in rubber products, road tarmac and so forth. Compost and crushed building rubble will also be sold.

5.2 CTMM

The upgrading of the Kwaggasrand Recycling Facility into a multi-purpose recycling facility will benefit the CTMM in the following ways:

- By removing recyclable waste material from the waste stream before it is taken to landfill, less material will be taken to the Onderstepoort Landfill Site. This will extend the lifespan of this landfill site; and
- The project will assist the CTMM in complying with the National Environmental Management: Waste Act, 2008, and the National Waste Management Strategy which requires all metropolitan municipalities to initiate programmes for waste separation and to divert 25% of recyclables from landfill for re-use, recycling or recovery by 2016 (Metroplan, 2013).

5.3 Local Community

The upgrading of the waste recycling facility will generate 312 new, permanent, full-time jobs and will create a cleaner city for all the local residents (Metroplan, 2013). The local community will benefit from being able to drop off their sorted recyclable waste at the facility for recycling. The project can therefore help to increase levels of participation in recycling programmes and public confidence in such schemes.

5.4 Economy

The proposed project can help to stimulate economic growth and especially the growth of a green economy in the CTMM.

5.5 Global Scale

Recycling facilities have a benefit on a wider scale as they decrease the need for the extraction of virgin materials. This decreases the Carbon Dioxide emissions associated with the extraction and

processing of virgin materials. For example, the recycling of plastic saves approximately 2.5kg of CO₂ per kilogram of plastic. Whereas the production of plastic generates 6kg CO₂ per kilogram of plastic produced, recycled plastic only generates 3.5kg CO₂ (Pusch, 2009).

Also, decreasing the amount of waste sent to landfill, where the anaerobic decomposition of waste produces methane (CH₄) [a greenhouse gas with a Global Warming Potential 21 times that of CO₂ (US EPA, 2006)], decreases CH₄ emissions to the atmosphere.

5.6 Need and Desirability in terms of the Guideline on Need and Desirability dated 20 October 2014

On the 20th of October 2014, the Department of Environmental Affairs published a Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010, in Government Notice 891 of 2014. The following table indicates how the guideline requirements were addressed in this report.



Table 18: Need and Desirability of the proposed project

Requirement	Part where requirement is addressed/response
<p>1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?⁴</p>	<p>The development and its associated elements/aspects will take place on land that has historically been disturbed through soil stripping, dumping of waste, cultivation of plots and the establishment and operation of a construction camp and so forth. The majority of vegetation at the project property is therefore in a disturbed state, with southern parts of the property being dominated by secondary and disturbed grasslands.</p> <p>Table 25 in section 7.3 of this report gives a detailed discussion and impact rating of the proposed development on the ecological integrity of the project property.</p>
<p>1.1. How were the following ecological integrity considerations taken into account?</p>	
<p>1.1.1 <i>Threatened Ecosystems.</i>⁵</p>	<p>A Vegetation Assessment was conducted for the project site. The site is situated within the original extent of the Critically Endangered (CR) Witwatersberg Pretoria Mountain Bushveld ecosystem. This ecosystem is listed under criterion F that includes priority areas for meeting explicit biodiversity targets as defined in a systematic biodiversity plan. This implies that the area has a very high irreplaceability. Remaining natural areas within the extent of this ecosystem area are therefore of high sensitivity and should not be developed.</p>

⁴ Section 24 of the Constitution and section 2(4)(a)(vi) of NEMA refer.

⁵ Must consider the latest information including the notice published on 9 December 2011 (Government Notice No. 1002 in Government Gazette No. 34809 of 9 December 2011 refers) listing threatened ecosystems in terms of Section 52 of National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

Requirement	Part where requirement is addressed/response
	<p>The development will take place on land that has historically been disturbed through soil stripping, dumping of waste, cultivation of plots, the establishment and operation of a construction camp and so forth. The majority of vegetation at the project property is therefore in a disturbed state, with southern parts of the property being dominated by secondary and disturbed grasslands.</p> <p>The Vegetation Assessment aided in determining the risks posed by the proposed development on the vegetation of the site, as assessed in section 7.3 of this report.</p> <p>According to the ArcGIS databases, no wetlands are present on site. Refer also to section 2.6 and 2.10 of this report.</p>
<p>1.1.2 <i>Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.</i>⁶</p>	<p>According to the ArcGIS databases, no wetlands are present on site. Also, no other sensitive, vulnerable, highly dynamic or stressed ecosystems are known to occur onsite. Refer also to section 2.10 of this report.</p>
<p>1.1.3 <i>Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs").</i></p>	<p>A Vegetation Assessment was conducted for the project site. According to the Vegetation Assessment and the Gauteng Conservation Plan (C-Plan), the southern section of the site infringes on a small section classified as "Important", as well as an "Ecological Support Area" (ESA).</p> <p>Refer also to section 2.6 and Figure 21 of this report.</p>
<p>1.1.4 <i>Conservation targets.</i></p>	<p>The conservation target for the Gauteng Shale Mountain Bushveld vegetation</p>

⁶ Section 2(4)(r) of NEMA refers.



Requirement	Part where requirement is addressed/response
	type is 24%. Less than 1% is statutorily conserved in for example, the Skanskop and Hartebeesthoek Nature Reserves, Groenkloof National Park and Magaliesberg Nature Area. More than 1% is conserved in other reserves (Mucina & Rutherford, 2006).
1.1.5 <i>Ecological drivers of the ecosystem.</i>	Mitigation measures were identified and recommended in section 7.3 of this report and the EMP to avoid, minimise and/or remedy the influence of ecological drivers such as the influence of alien invasive plant species, uncontrolled fires and human activity.
1.1.6 <i>Environmental Management Framework.</i>	Gauteng has a provincial Environmental Management Framework (GPEMF), 2014. According to the GPEMF, the project property lies within Zone 1 and Zone 2 of the GPEMF. Zone 1 is the “Urban Development Zone” and Zone 2 is the “High Control Zone (within the Urban Development Zone)”. The intention of Zone 1 is to streamline urban development activities, promote development infill, densification and concentration of urban development, in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas. The proposed development is in line with Zone 1’s objectives. Zone 2 is sensitive to development activities. Only conservation should be allowed in this zone. Related tourism and recreation activities must be accommodated in areas surrounding this zone. The proposed development is not in line with the objectives of Zone 2, however, the project property is in a disturbed state.
1.1.7 <i>Spatial Development Framework.</i>	<p>In March 2014, council approved the 2013 Regional Spatial Development Frameworks (RSDFs) for the seven regions of the City of Tshwane. The project property lies within Region 3 of the City of Tshwane.</p> <p>According to the Region 3 RSDF, the project property is designated as partly</p>



Requirement	Part where requirement is addressed/response
	<p>“ridge” (the southern part of the property) and “Suburban Density”. The proposed strategy for the Kwaggasrand area is “expansion”. This strategy states the following: “Implement an expansion strategy with regards to existing facilities and provide additional retail space at Quagga Centre”. The upgrading of the Kwaggasrand Recycling Facility is therefore in line with the proposed strategy for the Kwaggasrand area of Region 3.</p>
<p>1.1.8 <i>Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).</i>⁷</p>	<p>The activities related to the recycling facility upgrade will have insignificant contributions towards global and international responsibilities.</p>
<p>1.2 How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?⁸</p>	<p>A Vegetation Assessment was conducted in order to determine the impact of the proposed project on the biological diversity and ecosystems of the project property. Refer to section 2 and 7.3.5 (specifically Table 25) of this report for a description of the impact that the proposed development will have on biological diversity.</p> <p>Mitigation measures were identified to minimise the impact of the development on the environment. Refer to section 7.3.5 of this report.</p>
<p>1.3 How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?⁹</p>	<p>Potential negative environmental impacts associated with the development were identified and evaluated in section 7.3 of this report. Mitigation measures were identified and recommended in section 7.3 and the EMP to avoid, minimise and/or remedy negative environmental impacts.</p>
<p>1.4 What waste will be generated by this development? What measures were explored to</p>	<p>Generation waste, such as building rubble and domestic waste, will be</p>

⁷ Section 2(4)(n) of NEMA refers.

⁸ Section 24 of the Constitution and Sections 2(4)(a)(i) and 2(4)(b) of NEMA refer.

⁹ Section 24 of the Constitution and Sections 2(4)(a)(ii) and 2(4)(b) of NEMA refer.



Requirement	Part where requirement is addressed/response
<p>firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?¹⁰</p>	<p>generated during the construction phase of the proposed project. Some hazardous waste, such as spilt oil or diesel may also result. Mitigation measures were recommended in section 7.3.5 of this report and the EMP to effectively manage and minimise waste generated by the development.</p> <p>Recyclable waste that will be generated during the operational phase will be fed into the recycling facility for processing onsite. Waste that cannot be recycled will be taken to an offsite re-use, recycling or disposal facility, whichever is applicable to the specific waste type.</p>
<p>1.5 How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?¹¹</p>	<p>A Phase 1 Heritage Impact Assessment and Palaeontological Desktop Assessment was conducted for the project site during July 2015.</p> <p>The assessment of the study area revealed no sites, features or artefacts of cultural heritage (archaeological or historical) origin or significance.</p> <p>The site has a high to very high palaeontological sensitivity in terms of the likelihood of fossils being present onsite, should deep excavations be undertaken and bedrock be exposed.</p> <p>Refer to section 2.11 of this report.</p>
<p>1.6 How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the</p>	<p>The proposed development will use non-renewable natural resources, such as electricity (indirect use of coal at power stations).</p>

¹⁰ Section 24 of the Constitution and Sections 2(4)(a)(iv) and 2(4)(b) of NEMA refer.

¹¹ Section 24 of the Constitution and Sections 2(4)(a)(iii) and 2(4)(b) of NEMA refer.



Requirement	Part where requirement is addressed/response
resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts? ¹²	Mitigation measures have been recommended in section 7.3.5 of this report and the EMP to ensure that the non-renewable resources are used efficiently and not waste.
1.7 How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts? ¹³	This development will not use or impact upon any renewable natural resources.
1.7.1 <i>Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)</i>	The dependency or increased use of resources will not be exacerbated by the proposed development. The proposed project is specifically aimed at decreasing the City of Tshwane's reliance on landfill sites by diverting recyclable general waste streams to the Kwaggasrand multi-purpose recycling facility.
1.7.2 <i>Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)</i>	The resource use is justifiable and will not affect intra- and intergenerational equity. Refer to Section 7.3.5 of this report for the mitigation measures recommended in terms of resource usage.

¹² Section 24 of the Constitution and Sections 2(4)(a)(v) and 2(4)(b) of NEMA refer.

¹³ Section 24 of the Constitution and Sections 2(4)(a)(vi) and 2(4)(b) of NEMA refer.



Requirement	Part where requirement is addressed/response
1.7.3 <i>Do the proposed location, type and scale of development promote a reduced dependency on resources?</i>	The proposed location, type and scale of the development does reduce the dependency on resources. The facility is situated in close proximity to the residential areas that it will service, thereby decreasing fuel used to transport waste to the Kwaggasrand recycling facility. The proposed project is specifically aimed at decreasing the City of Tshwane's reliance on landfill sites by rather diverting recyclable general waste streams to the Kwaggasrand multi-purpose recycling facility.
1.8 How were a risk-averse and cautious approach applied in terms of ecological impacts? ¹⁴	<p>A risk-averse and cautious approach was followed in terms of ecological impacts through the commissioning of a Fauna Assessment in order to investigate the ecological state of the project property. The Fauna Assessment found that the property is in a disturbed state, with areas on site being classed as “disturbed” and “transformed and secondary grassland”. The property was specifically chosen for the proposed project because of its historical disturbance.</p> <p>Refer also to sections 2, 6 and 7 of this report.</p>
1.8.1 <i>What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?</i>	<p>It is believed that no knowledge gaps exist in terms of the proposed project, the current state of the environment, as well as the potential impacts associated with the proposed project. Also, no uncertainties have been identified.</p> <p>The following assumptions are made:</p> <ul style="list-style-type: none"> • That all information provided by the applicant regarding the proposed

¹⁴ Section 24 of the Constitution and Section 2(4)(a)(vii) of NEMA refer.



Requirement	Part where requirement is addressed/response
	<p>project is correct.</p> <ul style="list-style-type: none"> • That the mitigation measures proposed in this report and the EMP are implemented correctly and are effective. • All specialist opinions are accurate. • All research/reference sources are accurate. • That there will be no significant changes to the proposed project that could affect the findings and recommendations of this report and the EMP.
1.8.2 <i>What is the level of risk associated with the limits of current knowledge?</i>	Based on the above described gaps, uncertainties and assumptions, it is our opinion that the level of risk associated with the limits of current knowledge is low.
1.8.3 <i>Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?</i>	A risk-averse and cautious approach was applied to this proposed development as the limitations and gaps in knowledge regarding the impacts of the proposed development were taken into account.
1.9 How will the ecological impacts resulting from this development impact on people's environmental right in terms following: ¹⁵	
1.9.1 <i>Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?</i>	Refer to section 7 of this report for all impacts and mitigation measures associated with this project.
1.9.2 <i>Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?</i>	Careful site selection was carried out to ensure minimal impacts on the receiving environment. This resulted in a historically disturbed site being chosen for the proposed project. The proposed project will have a significant

¹⁵ Section 24 of the Constitution and Sections 2(4)(a)(viii) and 2(4)(b) of NEMA refer.



Requirement	Part where requirement is addressed/response
	positive impact upon the overall management of waste within the City of Tshwane Metropolitan Municipality. The upgraded recycling facility will divert vast quantities of recyclable waste from the landfill sites, where landfill airspace is dwindling. The processing of the recyclable waste at the recycling facility will prolong the available airspace at the landfill sites and extend their operational lifespans. The recycling facility has been designed to enhance these positive impacts by making provision for the processing of a multitude of different waste streams.
1.10 Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	Refer to sections 5 and 7 of this report for all impacts associated with this project.
1.11 Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	Refer to section 7 of this report for all impacts associated with this project.
1.12 Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations? ¹⁶	Refer to section 7 of this report for all impacts associated with this project. Section 6 describes the various alternatives considered for this project.
1.13 Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and	Refer to section 7 of this report.

¹⁶ Section 2(4)(b) of NEMA refer.



Requirement	Part where requirement is addressed/response
existing and other planned developments in the area? ¹⁷	
2.1 What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?	
2.1.1 <i>The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,</i>	The Integrated Development Plan of the City of Tshwane Metropolitan Municipality (Draft 2014/15 IDP Review) was approved by the council in March 2014.
2.1.2 <i>Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),</i>	It is not expected that the proposed development will impact upon spatial priorities and patterns.
2.1.3 <i>Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and</i>	The existing land use of the area is urban built up land, including residential areas and a shopping complex; natural areas; and a landfill site (closed). The proposed development fits into the waste management land use of the adjacent landfill site and is situated at an existing recycling facility, on land that is zoned for Industrial 1 land uses.
2.1.4 <i>Municipal Economic Development Strategy ("LED Strategy").</i>	<p>The City of Tshwane Growth and Development Strategy identifies top-line economic development goals that must form the basis for the suite of broad economic development strategies that need to be developed or enhanced for the CTMM. The first strategy initiative is for the "Growing and Expanding Existing Area Business".</p> <p>The upgrading of the existing Kwaggasrand Recycling Facility is therefore in line with the above mentioned economic development strategy.</p>

¹⁷ Regulations 22(2)(i)(i), 28(1)(g) and 31(2)(1) in Government Notice No. R. 543 refer.



Requirement	Part where requirement is addressed/response
2.2 Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	Refer to section 7 of this report for all impacts associated with this project.
2.2.1 <i>Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?</i>	<p>The applicant, NewGX, has been awarded a tender by the CTMM for the provision of the following services in Region 3 and Region 4 of the City of Tshwane:</p> <ul style="list-style-type: none"> • Weekly waste collection; • Litter picking; • Illegal dumping clearance; and • Skip removal services, as and when required. <p>Through the fulfilment of the above mentioned tender, New GX also develops local Small, Medium and Micro-sized Enterprises (SMMEs). NewGX is also contractually required to support community based recycling initiatives and establish a buy-back centre or centres.</p>
2.3 How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities? ¹⁸	The proposed project will aim to service a specific need within the CTMM, namely to divert recyclable waste from landfill and thereby increase the lifespan of the existing landfill sites within the CTMM. The community's need for a recycling facility where they can take their sorted-at-source household waste will also be met by the proposed project.
2.4 Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? ¹⁹ Will the impact be socially and economically sustainable in the short- and long-term?	The proposed development will have an equitable impact distribution over the short (construction phase) and long-term (operational phase). The impacts, as shown in Section 7.3.5 of this report, are mostly low taking mitigatory

¹⁸ Section 2(2) of NEMA refers.



Requirement	Part where requirement is addressed/response
	measures into account, for both the construction and operational phases. The development will be sustainable over the short and long-term as the operation of the recycling facility is anticipated well into the future (at least for the next 15 years).
2.5 In terms of location, describe how the placement of the proposed development will: ²⁰	
2.5.1 result in the creation of residential and employment opportunities in close proximity to or integrated with each other,	Employment opportunities will be created for people in the area during the construction and operational phases of the proposed project.
2.5.2 reduce the need for transport of people and goods,	The proposed project will not have an impact on the transportation of people or goods.
2.5.3 result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),	The proposed project will not have an impact on access to public transport or non-motorised and pedestrian transport.
2.5.4 compliment other uses in the area,	The existing land use of the area is urban built up land, including residential areas and a shopping complex; natural areas; and a landfill site (closed). The proposed development fits into the waste management land use of the adjacent landfill site and is situated at an existing recycling facility, on land that is zoned for Industrial 1 land uses. The close vicinity of the recycling facility to the residential areas facilitates its role in diverting household waste and municipal green waste from landfill to the recycling facility.
2.5.5 be in line with the planning for the area,	The project property is zoned for Industrial 1 land uses and the proposed project is in line with this approved zoning of the property.

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¹⁹ Sections 2(2) and 2(4)(c) of NEMA refers.

²⁰ Section 3 of the Development Facilitation Act, 1995 (Act No. 67 of 1995) ("DFA") and the National Development Plan refer.



Requirement	Part where requirement is addressed/response
	The upgrading of the Kwaggasrand Recycling Facility is in line with the proposed strategy for the Kwaggasrand area of Region 3, as per the Region 3 Regional Spatial Development Framework.
2.5.6 <i>for urban related development, make use of underutilised land available with the urban edge,</i>	The proposed development will make use of underutilised land available with the urban edge as a mostly undeveloped property will be developed for the proposed project. The only infrastructure currently on the property is the existing recycling facility building and a boundary fence. The remainder of the property is not currently being used. The proposed project will therefore use the currently unused areas (underutilised land within the urban edge).
2.5.7 <i>optimise the use of existing resources and infrastructure,</i>	By proposing to implement the upgrade project at the existing Kwaggasrand Recycling Facility, existing infrastructure in the form of the recycling building and access point off Maunde Street will be utilised.
2.5.8 <i>opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),</i>	It is believed that the provision of bulk infrastructure to the site will be in line with bulk infrastructure planning for the City of Tshwane.
2.5.9 <i>discourage "urban sprawl" and contribute to compaction/densification,</i>	It is not anticipated that the project will contribute towards "urban sprawl" and the use of the project property, which is currently an underutilised property within the urban area, should contribute towards compaction/densification.
2.5.10 <i>contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,</i>	It is not foreseen that the proposed project will contribute towards the correction of historically distorted settlement spatial patterns or the use of existing infrastructure in excess of current needs.
2.5.11 <i>encourage environmentally sustainable land development practices and processes,</i>	Efficient resource usage, effective waste management and control and mitigation of environmental impacts. Refer to section 7 of this report for all impacts and mitigation measures associated with this project.



Requirement	Part where requirement is addressed/response
2.5.12 <i>take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),</i>	The proposed development location has been chosen as it has ready, existing access from Maunde Street (access to an existing road network).
2.5.13 <i>the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),</i>	The proposed project will result in high economic returns as a result of job creation and the stimulation of the local economy.
2.5.14 <i>impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and</i>	<p>A Phase 1 Heritage Impact Assessment and Palaeontological Desktop Assessment was conducted for the project site during July 2015.</p> <p>The assessment of the study area revealed no sites, features or artefacts of cultural heritage (archaeological or historical) origin or significance.</p> <p>The site has a high to very high palaeontological sensitivity in terms of the likelihood of fossils being present onsite, should deep excavations be undertaken and bedrock be exposed.</p> <p>Refer to section 2.11 of this report.</p>
2.5.15 <i>in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?</i>	It is not foreseen that the proposed project will act as a catalyst to create a more integrated settlement.
2.6 How were a risk-averse and cautious approach applied in terms of socio-economic impacts?: ²¹	A risk-averse and cautious approach was applied by taking into account the limitations and gaps in knowledge regarding the impacts of the proposed development.
2.6.1 <i>What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?²²</i>	It is believed that no knowledge gaps exist in terms of the proposed project, the current state of the environment, as well as the potential impacts

²¹ Section 2(4)(a)(vii) of NEMA refers.



Requirement	Part where requirement is addressed/response
	<p>associated with the proposed project. Also, no uncertainties have been identified.</p> <p>The following assumptions are made:</p> <ul style="list-style-type: none"> • That all information provided by the applicant regarding the proposed project is correct. • That the mitigation measures proposed in this report and the draft EMP are implemented correctly and are effective. • All specialist opinions are accurate. • All research/reference sources are accurate. • That there will be no significant changes to the proposed project that could affect the findings and recommendations of this report and the draft EMP.
<p>2.6.2 <i>What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?</i></p>	<p>Based on the above described gaps, uncertainties and assumptions, it is our opinion that the level of risk associated with the limits of current knowledge is low.</p>
<p>2.6.3 <i>Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?</i></p>	<p>A risk-averse and cautious approach was applied to this proposed development as the limitations and gaps in knowledge regarding the impacts of the proposed development were taken into account.</p>
<p>2.7 How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:</p>	
<p>2.7.1 <i>Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?</i></p>	<p>It is not anticipated that the proposed project will impact significantly on people's health, safety and social ills.</p>

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²² Section 24(4) of NEMA refers.



Requirement	Part where requirement is addressed/response
2.7.2 <i>Positive impacts. What measures were taken to enhance positive impacts?</i>	Careful site selection was carried out to ensure minimal impacts on the receiving environment. This resulted in a historically disturbed site being chosen for the proposed project. The proposed project will have a significant positive impact upon the overall management of waste within the City of Tshwane Metropolitan Municipality. The upgraded recycling facility will divert vast quantities of recyclable waste from the landfill sites, where landfill airspace is dwindling. The processing of the recyclable waste at the recycling facility will prolong the available airspace at the landfill sites and extend their operational lifespans. The recycling facility has been designed to enhance these positive impacts by making provision for the processing of a multitude of different waste streams.
2.8 Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	It is not anticipated that the development's socioeconomic impacts will result in new, direct ecological impacts.
2.9 What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations? ²³	Refer to section 6 of this report.
2.10 What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? ²⁴ Considering the need for social equity and justice, do the alternatives identified, allow the "best	Refer to section 6 of this report. The alternatives identified allow for the "best practicable environmental option" to be selected.

²³ Section 2(4)(b) of NEMA refers.

²⁴ Section 2(4)(c) of NEMA refers.



Requirement	Part where requirement is addressed/response
practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	
2.11 What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination? ²⁵	Local labourers up to a certain skills level will be employed during the construction phase of the recycling facility upgrade project.
2.12 What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle? ²⁶	Mitigation measures were recommended to ensure that the environmental consequences of the proposed development were addressed. Refer to section 7 for all environmental impacts identified and mitigation measures proposed for the development.
2.13 What measures were taken to:	
2.13.1 <i>ensure the participation of all interested and affected parties,</i>	<p>The public participation process for this project was conducted by Shangoni Management Services in terms of:</p> <ul style="list-style-type: none"> • The procedures and provisions in terms of the NEMA (as amended), 2008; • Chapter 6 of the EIA Regulations of 2010; • GN 807: Public Participation Guideline in the Environmental Impact Assessment Process, dated October 2012; and • Other relevant legislation such as the Promotion of Access to Information Act (PAIA), 2000. Also refer to section 4 of this report.
2.13.2 <i>provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,</i> ²⁷	The public participation process is open to all parties. Public notices and a newspaper advertisement were distributed to encourage participation.

²⁵ Section 2(4)(d) of NEMA refers.

²⁶ Section 2(4)(e) of NEMA refers.



Requirement	Part where requirement is addressed/response
2.13.3 ensure participation by vulnerable and disadvantaged persons, ²⁸	The public participation process is open to all parties, including vulnerable and disadvantaged persons.
2.13.4 promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means, ²⁹	All employees will undergo environmental awareness/training.
2.13.5 ensure openness and transparency, and access to information in terms of the process, ³⁰	<p>The public participation process for this project was conducted by Shangoni Management Services in terms of:</p> <ul style="list-style-type: none"> • The procedures and provisions in terms of the NEMA (as amended), 2008; • Chapter 6 of the EIA Regulations of 2010; • GN 807: Public Participation Guideline in the Environmental Impact Assessment Process, dated October 2012; and • Other relevant legislation such as the Promotion of Access to Information Act (PAIA), 2000. Also refer to section 4 of this report. <p>Therefore, the process was open and transparent and the public had access to all documents. All public comments have been included in this document and were adequately addressed.</p>
2.13.6 ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge ³¹ , and	The public participation process for this project was conducted by Shangoni Management Services in terms of:

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²⁷ Section 2(4)(f) of NEMA refers.

²⁸ Section 2(4)(f) of NEMA refers.

²⁹ Section 2(4)(h) of NEMA refers.

³⁰ Section 2(4)(k) of NEMA refers.



Requirement	Part where requirement is addressed/response
	<ul style="list-style-type: none"> • The procedures and provisions in terms of the NEMA (as amended), 2008; • Chapter 6 of the EIA Regulations of 2010; • GN 807: Public Participation Guideline in the Environmental Impact Assessment Process, dated October 2012; and • Other relevant legislation such as the Promotion of Access to Information Act (PAIA), 2000. Also refer to section 4 of this report.
2.13.7 <i>ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted?</i> ³²	<p>The public participation process for this project was conducted by Shangoni Management Services in terms of:</p> <ul style="list-style-type: none"> • The procedures and provisions in terms of the NEMA (as amended), 2008; • Chapter 6 of the EIA Regulations of 2010; • GN 807: Public Participation Guideline in the Environmental Impact Assessment Process, dated October 2012; and • Other relevant legislation such as the Promotion of Access to Information Act (PAIA), 2000. Also refer to section 4 of this report.
2.14 Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)? ³³	Local labourers up to a certain skills level will be employed during the construction phase of the recycling facility upgrade project.
2.15 What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment	All contractors, sub-contractors and workers will attend compulsory environmental awareness training and inductions. This training will highlight

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³¹ Section 2(4)(g) of NEMA refers.³² Section 2(4)(q) of NEMA refers.³³ x

Requirement	Part where requirement is addressed/response
or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected? ³⁴	the dangers associated with the workplace. Procedures relating to environmental risks will also be put in place and will be regularly updated.
2.16 Describe how the development will impact on job creation in terms of, amongst other aspects:	
2.16.1 <i>the number of temporary versus permanent jobs that will be created,</i>	±70 new, temporary employment opportunities will be created during the construction phase and ±261 new, permanent employment opportunities will be created during the operational phase of the proposed project.
2.16.2 <i>whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),</i>	Local labourers up to a certain skills level will be employed during the construction phase of the recycling facility upgrade project.
2.16.3 <i>the distance from where labourers will have to travel,</i>	Local labourers will be employed as far as possible, to minimise travel distances.
2.16.4 <i>the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and</i>	The location of the job opportunities will be in close proximity to the proposed development.
2.16.5 <i>the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).</i>	The development will create job opportunities without impacting on employment opportunities in other sectors.
2.17 What measures were taken to ensure:	
2.17.1 <i>that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and</i>	All applicable environmental legislation was considered and adhered to during the Environmental Impact Assessment process. Refer to section 3 of this report.
2.17.2 <i>that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?</i>	The public participation process for this project was conducted by Shangoni Management Services in terms of: <ul style="list-style-type: none"> • The procedures and provisions in terms of the NEMA (as amended), 2008;

³⁴ Section 2(4)(j) of NEMA refers.



Requirement	Part where requirement is addressed/response
	<ul style="list-style-type: none"> • Chapter 6 of the EIA Regulations of 2010; • GN 807: Public Participation Guideline in the Environmental Impact Assessment Process, dated October 2012; and • Other relevant legislation such as the Promotion of Access to Information Act (PAIA), 2000. Also refer to section 4 of this report.
<p>2.18 What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?³⁵</p>	<p>All mitigation measures proposed as part of this Environmental Impact Assessment process have been focussed on minimising the potential impacts associated with the proposed development. The focus is on the protection of the environment through various measures, including pollution minimisation.</p> <p>The project property was specifically chosen due to its historical disturbance, in order to minimise the disturbance of the environment. An alternative would have been to establish the multi-purpose recycling facility at an undisturbed, natural location, which would have had greater negative impacts upon the environment. The public interest will also be served as the proposed project will prolong the lifespan of existing landfill sites in the CTMM. This is beneficial to all residents within the municipal area.</p>
<p>2.19 Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?³⁶</p>	<p>The mitigation measures are realistic, as also described in item 2.18 above. Also refer to sections 7 and 8 of this report.</p>
<p>2.20 What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing,</p>	<p>The applicant will be responsible for the costs of any remediation of pollution, environmental degradation and consequent adverse health effects and of</p>

³⁵ Section 2(4)(o) of NEMA refers.

³⁶ Section 240(1)(b)(iii) of NEMA and the National Development Plan refer.



Requirement	Part where requirement is addressed/response
controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment? ³⁷	preventing, controlling or minimising further pollution, environmental damage or adverse health effects.
2.21 Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations? ³⁸	Refer to sections 6 and 8.2 of this report.
2.22 Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area? ³⁹	Cumulative impacts are described in section 7.3.6 of this report.

³⁷ Section 2(4)(p) of NEMA refers.

³⁸ Section 2(4)(b) of NEMA refers.

³⁹ Regulations 22(2)(i)(i), 28(1)(g) and 31(2)(1) in Government Notice No. R. 543 refer.



6. IDENTIFIED ALTERNATIVES

The following definition of “alternatives” is given in the EIA Regulations of 18 June 2010: “alternatives”, in relation to the proposed activity, *means different means of meeting the general purpose and requirements of the activity, which may include alternatives to-*

- a) *the property on which or location where it is proposed to undertake the activity;*
- b) *the type of activity to be undertaken;*
- c) *the design or layout of the activity;*
- d) *the technology to be used in the activity;*
- e) *the operational aspects of the activity; and*
- f) *the option of not implementing the activity”.*

Typically, alternative assessments are conducted to assist in comparing various projects or attributes of projects that will occur. The most critical comparison is evaluating any proposed project against the No-Go option. The alternatives assessment then considers alternatives to project site selection for the proposed development; alternatives to layout of the development; and alternatives to construction methodologies and/or materials used for the development.

The alternatives assessment was conducted using a simple cost-benefit analysis of each proposed alternative, through assessing various environmental attributes. These attributes can include physical (geology and soils, surface water quality and quantity, groundwater quality and quantity); biophysical (flora and fauna, sensitive environments); and social attributes (site of archaeological or cultural importance, land use issues, social health and welfare).

The impact of the each alternative was then evaluated in terms of whether it has a positive, negative, or no impact. In this instance, the impact is not evaluated in terms of significance but rather whether or not it will arise. Positive impacts are assigned a value of 1; no impact a value of 0; and a negative impact a value of -1.

By adding all of the attribute scores for each alternative, a suitability score is derived that indicates the preferred alternative. A total positive score indicates the project benefits outweigh the potential negative impacts, while a total negative score indicates the project environmental costs outweigh the potential benefits. Essentially, the highest scoring alternative is then carried forward for full impact evaluation.



6.1 No-Go Option

The potential impact of the preferred project option on environmental and socio-economic attributes identified during the assessment phase is evaluated against the potential impact of the No-Go option on the same attributes. The summary of this assessment is provided in the table below.

Table 19: Development vs. No-Go option

Attribute	Development Option	No-go Option
Physical environment		
Air Pollution	-1	-1
Noise Pollution	-1	0
Water Quality	0	0
Water Quantity	-1	0
Visual Aesthetics	1	-1
Biophysical environment		
Fauna and Flora	0	0
Sensitive Environments	0	0
Social environment		
Traffic	-1	0
Impact on property values	1	-1
Safety and security	1	-1
Local and regional economy	1	0
Infrastructure development	1	0
Total	1	-4

As can be seen in the table above, the development option (the upgrading project) is preferred to the No-Go option (the operation of the existing recycling facility), as derived from comparative analysis. While the development option has negative impacts in terms of air and noise pollution, water quantity and the generation of traffic, it also has benefits in terms of visual aesthetics (as the mostly vacant site will be developed), property values, safety and security, infrastructure development and the local and regional economy. The positive social impacts outweigh the negative environmental impacts to give an overall positive score of “1”, whereas the No-Go Option results in a negative score of “-4”.

6.2 Alternatives considered

6.2.1 Activity alternatives

General waste

In terms of general waste (cardboard, paper, plastic, glass and cans), the activity is the recycling, recovery and treatment of the waste. One alternative to this would be to dispose of the waste material at a landfill site where it would take up valuable landfill airspace. Another alternative is to incinerate the waste, but this results in atmospheric emissions and the volumes of waste that would need to be



incinerated are also very large. Certain material, such as glass and cans can also not be incinerated. The proposed activity is the preferred option as the recycled, recovered and treated waste material can be re-used in manufacturing processes instead of virgin materials. This is preferable from both an economic and environmental point of view.

Green waste

The activity is the shredding and composting of the plant material. An alternative activity would be to dispose of the waste material at a landfill site where it would take up valuable landfill airspace. Another alternative is to incinerate the waste, but this results in atmospheric emissions and the volumes of waste that would need to be incinerated are large. It is therefore favourable for the green waste to rather be composted and the resulting compost sold for use in gardening.

Wet waste

The activities relating to wet waste are the sorting; taking offsite for bio-digesting; drying of wet waste to produce Refuse Derived Fuel (RDF); or baling and plastic wrapping of wet waste. Initially, it was proposed to feed the wet waste into an in-vessel composter or to bale the wet waste. Subsequent to further investigations into in-vessel composter technology, it has been found that compost produced via in-vessel composting should not be used for agricultural application. As this is one of the proposed uses of the compost, the in-vessel composter is no longer a feasible option.

An alternative activity would be to dispose of the waste material at a landfill site where it would take up valuable landfill airspace. Another alternative is to incinerate the waste, but this results in atmospheric emissions and the volumes of waste that would need to be incinerated are also very large. It is therefore favourable for the wet waste to rather be taken offsite for bio-digestion or used as Refuse Derived Fuel, after the waste has been air dried.

Waste tyres

The activity is the de-beading, cutting, shredding, screening and grinding of waste tyres to produce rubber crumbs. The most prevalent alternative activity at this stage is the disposal of tyres to landfill or their accumulation at various facilities or on vacant land. In the last mentioned cases, the tyres are abandoned and unmanaged. Alternative methods to dispose of, recycle or re-use waste tyres include the following:

- Tyres can be re-treaded, whereby the remaining tread is removed and a new tread (rubber strip) is fused to the old “skeleton” of the tyre using vulcanisation. The quality of the re-treaded tyre is, however, not high;
- Tyres can be mechanically or cryomechanically milled/ground up and the rubber pieces used in other applications, such as for sport surfaces, carpets, playgrounds etc. If the rubber is ground up into a very fine powder, the powder can be used to reinforce new rubber products. These applications do not produce atmospheric emissions (the proposed activity);



- It has often been attempted to reclaim scrap rubber products, but the process is difficult and costly. The quality of the reclaimed rubber is also not high and the re-selling of the reclaimed rubber as a raw material is therefore problematic; and
- Pyrolysis presents an opportunity to produce valuable products from the waste tyres and can also result in less negative environmental impacts than for example, the burning of tyres or their disposal to landfill. The solid Char can be used as a smokeless fuel, to reinforce new rubber products or as activated Carbon. The oils can be used as fuels, a source of chemicals due to the oil's mixture of organic compounds, or as a feedstock for the petroleum industry (Juma *et al.*, 2006).

From the above alternatives for the disposal, recycling or re-use of waste tyres, the mechanical/cryomechanical milling of the waste tyres and pyrolysis are the two most practical options. The applicant is not interested in the establishment of a waste tyre pyrolysis plant and for that reason, the milling of the waste tyres is the most suitable activity alternative. This process will ensure that the resultant rubber crumbs can be sold for re-use.

Building rubble

The activity is the crushing and screening of building rubble. An alternative activity would be to dispose of the waste material at a landfill site where it would take up valuable landfill airspace. It is therefore favourable to crush the building rubble so that it can be re-used as foundation and filling material for construction projects.

All of the proposed activities are high up on the waste management hierarchy, as indicated in the figure below, whereas the alternative activity, namely disposal to landfill, is at the bottom of the hierarchy and is the least preferred option.



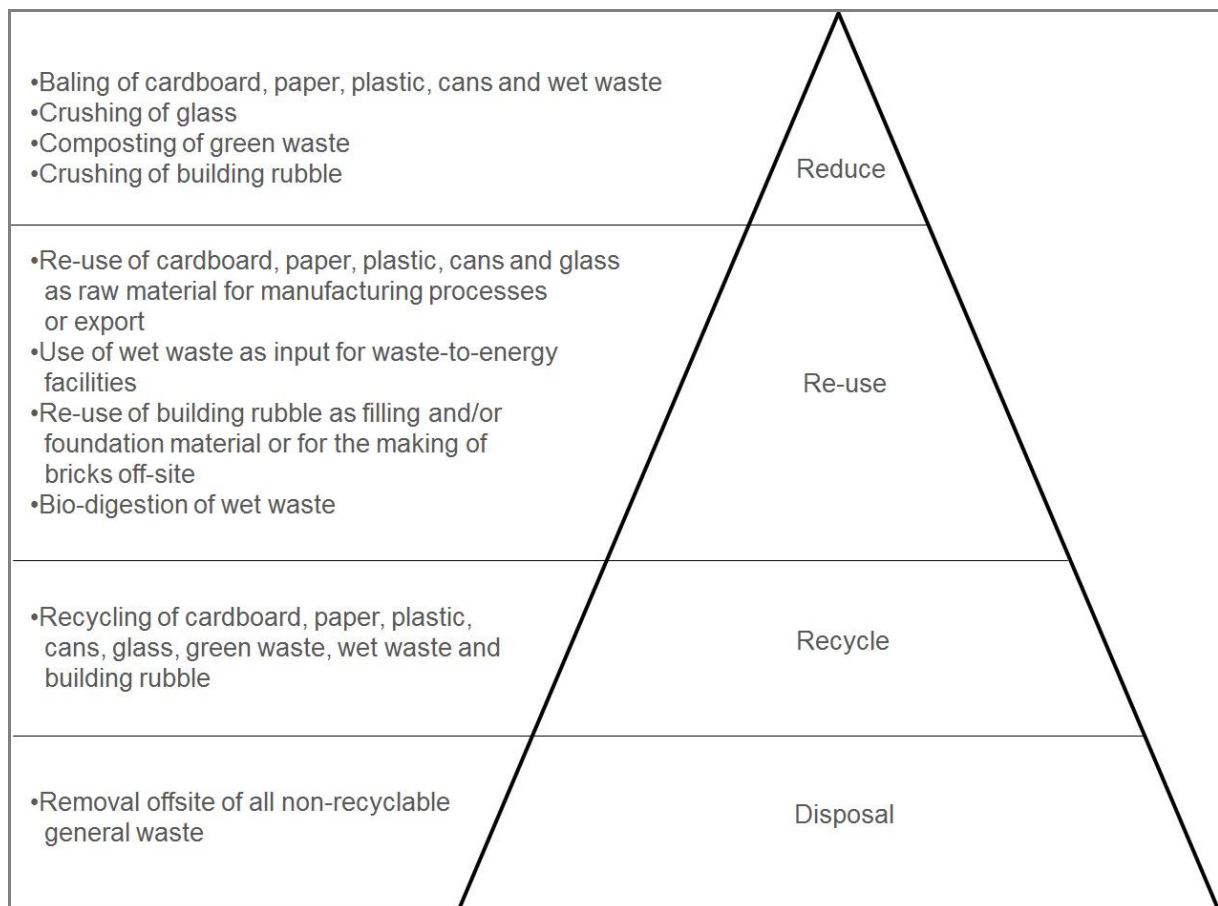


Figure 34: Waste Management Hierarchy

6.2.2 Location alternatives

Three location alternatives can be considered for this proposed project. The first is to establish the multi-purpose recycling facility on an undeveloped property, the second is to utilise a property with existing infrastructure suited for the proposed project and the third is to use a property with existing infrastructure, but which is not suited for the proposed project.

The use of an undeveloped property would entail the purchase or leasing of open land by the applicant and the development of the property from scratch. This would include the installation of all bulk services as well as the construction of the necessary buildings for the recycling facility. This alternative would entail financial costs for site establishment and is therefore not as economically feasible as a site with existing infrastructure present. It is also possible that such an undeveloped site may lie entirely within a Critical Biodiversity Area in terms of the Gauteng Conservation Plan (C-Plan) and its development could therefore result in negative impacts in terms of fauna and flora loss. The rezoning of such a site could also be necessary.

The use of a property with existing buildings that are suited to the proposed project is the preferred alternative and is the situation at the proposed site. The proposed site has an existing building where an established waste recycling operation is taking place. The majority of the site is also already in a

disturbed state which will decrease the need for site clearance should the project be approved. There is also an existing access point to the site from Maunde Street.

The use of a property with existing buildings that are not suitable to the proposed project, such as a property where the existing buildings were used for offices or as houses, is not a feasible alternative for the following reasons: The buildings would not be big enough nor designed for industrial use and would need to be demolished so that suitable buildings could be constructed. This would entail additional financial costs and is therefore not economically feasible. The rezoning of such as site could also be necessary.

6.2.3 Site layout alternatives

As the majority of the site is vacant, a number of site layout alternatives could be considered. As recycling activities are already occurring in the existing building on site, it makes practical sense to conduct the upgrade part of the project (to expand the processing capacity of the recycling facility) at the existing recycling facility, on the eastern part of the site. This is the first phase of the project. From there, it makes sense to implement the next phases, starting from the eastern side of the site and moving towards the western side, i.e. Phases 2 and 3 will be to the west of Phase 1, as shown in Figure 2. Positioning the phases in such a manner makes sense from a practical and financial point of view as infrastructure will be built close to existing infrastructure first and only extended to the far west of the site later on, when it is required. I.e. the internal road infrastructure will be extended from the existing, approved access point to the site from Maunde Street.

6.2.4 Process and design alternatives

The applicant will determine the optimal processes and designs for the upgrade of the waste recycling facility, the transfer station, the composting facility, the waste tyre crumbing facility, and the building rubble crushing plant. The designs will be based on industry best practice. Layout designs have been provided in this report and are also attached under Appendix C. No process and design alternatives have therefore been assessed as part of this EIA process.

6.2.5 Land use alternatives

The project property is zoned as “Industrial 1” land and the following uses are therefore permitted as primary rights on the property:

- Commercial Use: Land and buildings used for distribution centres, wholesale trade, storage, warehouses, telecommunication centres, transport depots, laboratories and computer centres and may include offices, light industries, a cafeteria and a caretaker’s flat, that are directly related and subservient to the main commercial use that is carried out on the land or in the building;
- Industry: Land and buildings where a product or part of a product is manufactured, mounted, processed, repaired, rebuilt or packed, including a power station and incinerator plant and may

- include a cafeteria and a caretaker's flat and any other activities connected to or incidental to the activities mentioned herein, excluding noxious industries, light industries and retail industries; and
- Light Industrial: Land and buildings used for, inter alia, a bakery, a builder's yard, a car wash, a contractor's yard, dry-cleaners, carpet cleaners, a joinery workshop, a launderette, a laundry, a lawnmower workshop, a painter's workshop, a plumber's workshop, a printing workshop, a transport depot, a panel-beater, motor workshops, a ready-mix plant and any other such industries, workshops or yards which in the opinion of the Municipality do not cause a nuisance to the environment, may be used for similar purposes and may include the retail sale of products ancillary and subservient to the main use on the same property.

Any of the above mentioned land uses could therefore be established on the proposed project property, however, the only proposed activities for the project property are those listed under section 1.5 of this report (proposed activities) and no other land use alternatives could be considered.



7. ENVIRONMENTAL IMPACT ASSESSMENT

7.1 Aims of Environmental Impact Assessment

Potential (biophysical) environmental impacts associated with the proposed upgrade of the Kwaggasrand Recycling Facility have been identified.

The Environmental Impact Assessment (EIA) phase aims to adequately investigate and address all potentially significant environmental issues in order to provide the Gauteng Department of Agriculture and Rural Development with sufficient information to make an informed decision regarding the proposed project.

This part of the document therefore focuses on the identification of the major potential impacts that the activities, processes and actions may have on the surrounding environment. It indicates the major impacts that these activities may have on the environmental components associated with the site, as required in terms of R.543 of the EIA Regulations, 2010.

The EIA aims to achieve the following:

- To provide a detailed assessment of the biophysical environments affected by the proposed project;
- To assess impacts on the study area in terms of environmental criteria; and
- To identify and recommend appropriate mitigation measures for potentially significant environmental impacts.

This EIR addresses the following:

- A detailed description of the proposed project;
- Detailed assessment of the impacts identified, that are determined to be potentially significant;
- Recommendations regarding the mitigation of significant impacts; and
- To meet the requirements and to comply with the necessary legislation and Acts.

This EIR addresses the following:

- A detailed description of the proposed project;
- Detailed assessment of the impacts identified, that are determined to be potentially significant;
- Recommendations regarding the mitigation of significant impacts; and
- To meet the requirements and to comply with the necessary legislation and Acts.

Any specialist studies are combined into this consolidated report to allow for easy assessment of the potential aspects with associated impacts.



7.2 Environmental Impact Assessment Procedure

The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk.

Impact assessments should be conducted based on a methodology that includes the following:

- Clear processes for impact identification, predication and evaluation;
- Specification of the impact identification techniques;
- Criteria to evaluate the significance of impacts;
- Design of mitigation measures to lessen impacts;
- Definition of the different types of impacts (indirect, direct or cumulative); and
- Specification of uncertainties.

After all impacts have been identified, the nature of each impact can be predicted. The impact prediction will take into account physical, biological, socio-economic and cultural information and will then estimate the likely parameters and characteristics of the impacts. The impact prediction will aim to provide a basis from which the significance of each impact can be determined and appropriate mitigation measures can be developed.

The risk assessment methodology is based on defining and understanding the three basic components of the risk, i.e. the source of the risk, the pathway and the target that experiences the risk (receptor). Refer to the figure below for a model representing the above principle (as contained in the DWA's Best Practice Guideline: G4 – Impact Prediction).

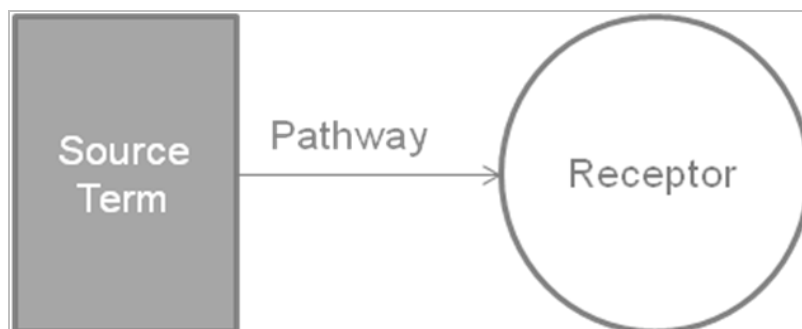


Figure 35: DWA's model for impact prediction (risk assessments)

Table 20 and Table 21 below indicate the methodology to be used in order to assess the Probability and Magnitude of the impact, respectively, and Table 22 provides the Risk Matrix that will be used to plot the Probability against the Magnitude in order to determine the Severity of the impact.



Table 20: Determination of Probability of Impact

Frequency of Aspect / Unwanted Event	Score	Availability of pathway from the source to the receptor	Score	Availability of receptor	Score
Never known to have happened, but may happen	1	A pathway to allow for the impact to occur is never available	1	The receptor is never available	1
Known to happen in industry	2	A pathway to allow for the impact to occur is almost never available	2	The receptor is almost never available	2
< once a year	3	A pathway to allow for the impact to occur is sometimes available	3	The receptor is sometimes available	3
Once per year to up to once per month	4	A pathway to allow for the impact to occur is almost always available	4	The receptor is almost always available	4
Once a month - Continuous	5	A pathway to allow for the impact to occur is always available	5	The receptor is always available	5

Step 1: Determine the **PROBABILITY** of the impact by calculating the average between the Frequency of the Aspect, the Availability of a pathway to the receptor and the availability of the receptor.



Table 21: Determination of Magnitude of Impact

Source								Receptor			
Duration of impact	Score	Extent	Score	Volume / Quantity / Intensity	Score	Toxicity / Destruction Effect	Score	Reversibility	Score	Sensitivity of environmental component	Score
Lasting days to a month	1	Effect limited to the site. (metres);	1	Very small quantities / volumes / intensity (e.g. < 50L or < 1Ha)	1	Non-toxic (e.g. water) / Very low potential to create damage or destruction to the environment	1	Bio-physical and/or social functions and/or processes will remain unaltered.	1	Current environmental component(s) are largely disturbed from the natural state. Receptor of low significance / sensitivity	1
Lasting 1 month to 1 year	2	Effect limited to the activity and its immediate surroundings. (tens of metres)	2	Small quantities / volumes / intensity (e.g. 50L to 210L or 1Ha to 5Ha)	2	Slightly toxic / Harmful (e.g. diluted brine) / Low potential to create damage or destruction to the environment	2	Bio-physical and/or social functions and/or processes might be negligibly altered or enhanced / Still reversible	2	Current environmental component(s) are moderately disturbed from the natural state. No environmentally sensitive components.	2
Lasting 1 – 5 years	3	Impacts on extended area beyond site boundary (hundreds of metres)	3	Moderate quantities / volumes / intensity (e.g. > 210 L < 5000L or 5 – 8Ha)	3	Moderately toxic (e.g. slimes) Potential to create damage or destruction to the environment	3	Bio-physical and/or social functions and/or processes might be notably altered or enhanced / Partially reversible	3	Current environmental component(s) are a mix of disturbed and undisturbed areas. Area with some environmental sensitivity (scarce / valuable environment etc.).	3
Lasting 5 years to Life of Organisation	4	Impact on local scale / adjacent sites (km's)	4	Very large quantities / volumes / intensity (e.g. 5000 L – 10 000L or 8Ha– 12Ha)	4	Toxic (e.g. diesel & Sodium Hydroxide)	4	Bio-physical and/or social functions and/or processes might be considerably altered or enhanced / potentially irreversible	4	Current environmental component(s) are in a natural state. Environmentally sensitive environment / receptor (endangered species / habitats etc.).	4
Beyond life of Organisation / Permanent impacts	5	Extends widely (nationally or globally)	5	Very large quantities / volumes / intensity (e.g. > 10 000 L or > 12Ha)	5	Highly toxic (e.g. arsenic or TCE)	5	Bio-physical and/or social functions and/or processes might be severely/substantially altered or enhanced / Irreversible	5	Current environmental component(s) are in a pristine natural state. Highly Sensitive area (endangered species, wetlands, protected habitats etc.)	5

Step 2: Determine the **MAGNITUDE** of the impact by calculating the average of the factors above.



Table 22: Determination of Severity of impact

ENVIRONMENTAL IMPACT RATING / PRIORITY					
	MAGNITUDE				
PROBABILITY	1 Minor	2 Low	3 Medium	4 High	5 Major
5 Almost Certain	Low	Medium	High	High	High
4 Likely	Low	Medium	High	High	High
3 Possible	Low	Medium	Medium	High	High
2 Unlikely	Low	Low	Medium	Medium	High
1 Rare	Low	Low	Low	Medium	Medium

Step 3: Determine the **SEVERITY** of the impact by plotting the averages that were obtained above for Probability and Magnitude in the table below.

7.3 Description of Environmental Impacts

The aim of this section of this EIA report is to provide information regarding the potential environmental impacts associated with the proposed activities. In order to provide background information and a framework for the environmental risk assessment, a description of the different phases of the project is provided below. Refer to the tables below for the impacts associated with the Kwaggasrand Recycling Facility upgrade project.

7.3.1 Planning and Design Phase

- Designing and planning of the recycling facility upgrade;
- Designing and planning of the waste tyre crumbing facility;
- Designing and planning of the composting facility;
- Designing and planning of the building rubble crushing plant;
- Designing and planning of the stormwater management system for the site;
- Designing and planning of the leachate collection pond for the composting facility; and
- Designing and planning of the wastewater collection and treatment system for the wastewater from the wet-waste processes.

7.3.2 Construction Phase

Phase 1B

- Installation of two weighbridges;
- Installation of an access gate;
- Upgrading of the existing recycling facility and construction of its associated infrastructures, such as docking/parking areas, areas for the dumping of waste and a waste and refuse storage area;



- Installation of the stormwater management system for the site;
- Installation of wastewater collection and treatment system for the wastewater from the wet-waste processes;
- Construction of staff facilities, including ablution facilities, offices, education centre, parking and a staff canteen; and
- Concurrent rehabilitation of disturbed areas, where applicable.

Phase 2

- Establishment of the composting facility;
- Installation of the leachate collection pond for the composting facility;
- Establishment of a storage area for baled and plastic wrapped refuse; and
- Concurrent rehabilitation of disturbed areas, where applicable.

Phase 3

- Installation of the building rubble crushing plant;
- Installation of the waste tyre crumbing facility; and
- Concurrent rehabilitation of disturbed areas, where applicable.

7.3.3 Operational Phase (general description applicable to all waste streams, for all phases of the project)

- The receipt of incoming waste;
- The weighing of the incoming waste using the weighbridge;
- Direction of the different waste streams to the appropriate processing areas;
- Offloading of the incoming waste;
- Processing of waste at the facility;
- Storage of processed waste fractions;
- Dispatch of processed waste fractions to off-take market;
- The weighing of the outgoing waste using the weighbridge.
- The release of treated wastewater of suitable quality into the municipal sewage system; and
- The pumping of sewage off site into the municipal sewage system.

7.3.4 Decommissioning Phase

Closure and decommissioning of the recycling facility is not anticipated for the foreseeable future. Should the facility close, a detailed closure and rehabilitation plan will be submitted to the Gauteng Department of Agriculture and Rural Development prior to decommissioning.



7.3.5 Impacts associated with the construction and operation of the upgraded Kwaggasrand Recycling Facility

7.3.5.1 Planning and Design Phase

Table 23: Environmental impact assessment: Planning and Design Phase

Activity:													
<ul style="list-style-type: none"> Designing and planning of the recycling facility upgrade, waste tyre storage area, waste tyre crumbing facility, composting facility and building rubble crushing plant. Designing and planning of the stormwater management system for the site. Designing and planning of the leachate collection pond for the composting facility. Designing and planning of the wastewater collection and treatment system for the wastewater from the wet-waste processes. Designing and planning of the sewage pipeline system. Designing and planning of the ablution facilities. Planning for the construction phase of the recycling facility upgrades. 													
Aspect:													
<ul style="list-style-type: none"> Inadequate design for the upgrading of the recycling facility, waste tyre storage area, waste tyre crumbing facility, composting facility and building rubble crushing plant.. Inadequate design of the stormwater management system for the site. Inadequate design of the leachate collection pond for the composting facility. Inadequate design of the wastewater collection and treatment system for the wastewater from the wet-waste processes. Inadequate design of the sewage pipeline system. Inadequate design of the ablution facilities. Inadequate planning for the construction phase of the recycling facility upgrades. 													
Nature and significance of environmental impact													
Project Phase Applicability	Planning and Design Phase		X										
	Construction		X										
	Operation												
	Decommissioning												
Impact Description			Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
Probability	Magnitude	Severity	Probability	Magnitude	Severity								
<ul style="list-style-type: none"> Non-compliance to environmental legislation. Air pollution (generation of dust) due to the inadequate design of the Recycling Facility. Soil erosion due to the inadequate design of the Recycling Facility. Contaminated runoff from waste handling areas. Leachate from the composting facility. Leachate from the waste tyre storage and crumbing facility. 			3	3	M	To ensure adequate design of the Recycling Facility.	<ul style="list-style-type: none"> The waste storage areas(s) must be designed according to the National Norms and Standards for the Storage of Waste (GN 926 of 29 November 2013). The waste storage area(s) must be registered on the Gauteng Waste Information System 90 days prior to them being constructed. The design of the Waste Tyre Storage Area and Crumbing Facility must be in accordance with the Waste Tyre Regulations, 2009. Adequate stormwater management measures must be designed for the Waste Tyre Storage Area. Make provision for impermeable roads, offloading areas, storage areas and processing areas, as well as curbs to prevent affected runoff from entering permeable areas. Make provision for affected water and/or wastewater collection systems, in order to contain and treat affected water within the boundaries of the site. The composting area must be designed with an impervious base to prevent leachate from percolating into the ground. A leachate collection and treatment system must be designed for the 	Before construction commences	<ul style="list-style-type: none"> NewGX Recycling facility designer/engineer 	2	2	L	<ul style="list-style-type: none"> NEMA, 1998 NEM:WA, 2008



					composting area. <ul style="list-style-type: none"> The building rubble crushing area must be designed with an impervious base, if possible. 						
Formation of subsidence features in dolomite residuum areas.	4	4	H	To prevent the ingress of water into the subsurface.	<p>Geotechnical parameters applicable to the property in view of the prevailing soil conditions</p> <ul style="list-style-type: none"> Soil Zones A and B tentatively classify as Site Class “C2/S2/P” according to the guidelines of the NHBRC Standards and Guidelines, 1999. The suffix “P” has been assigned to the classification due to the fact that the site may be underlain at depth by dolomite. In view of the potentially problematic soil conditions, modified normal construction may be considered for lightly loaded single-storey structures. Where heavy loads are proposed, one of the following foundation systems may be considered: stiffened or cellular raft foundations; soil raft foundations or piled or pier foundations. Soil Zone C classifies as NHBRC Site Class “P” due to the presence of unconsolidated fill and disturbed ground conditions. This zone should either be excluded from the development or be properly reinstated according to recognised engineering standards. Dolomite residuum was encountered in one test pit in this zone, implying that any development where ingress of water may take place (e.g. the composting facility) should be designed and constructed in a way not to trigger subsidence features. This implies that the area under consideration should be sealed in order to prevent ingress of water into the subsurface. Adequate stormwater drainage management should also be implemented to prevent ponding of surface water in this area. The gravelly material from Soil Zone A should qualify as G5 quality (after removal of the coarser than 150mm fraction) whereas the clayey sand from Soil Zone B should qualify as G7/G8 quality material. The site soils may be removed to at least 3.0m below the surface, using conventional earth-moving machines. Isolated areas are present in Soil Zone A where hard rock chert and large chert boulders are present and where encountered, will probably require jackhammer work and “pop” blasting for removal. The sidewalls of excavations should be temporarily stable during the dry season although instabilities of deep excavations may occur during the wet season. No groundwater seepages were encountered during the investigation, however, adequate damp-proofing precautions should be implemented and the normal drainage precautionary measures, applicable to dolomitic terrain, should be adhered to (van der Merwe, 2015). 	Before construction commences	<ul style="list-style-type: none"> NewGX Recycling facility designer/engineer 	2	3	M	<ul style="list-style-type: none"> NEMA, 1998 NHBRC Standards and Guidelines, 1999
<ul style="list-style-type: none"> Soil, stormwater or groundwater pollution due to the inadequate design and installation of the sewerage pipeline system. Wastage of a valuable natural resource (water) due to the inadequate design and installation of the water pipeline system. 	3	3	M	To ensure adequate design and installation of sewerage and water pipeline systems.	<ul style="list-style-type: none"> All pipelines must be designed with durability in mind. All pipelines must be designed in accordance with engineering and municipal requirements. Meters must be installed to monitor the volume of water used at the recycling facility. 	Before construction commences	<ul style="list-style-type: none"> NewGX Recycling facility designer/engineer 	2	2	L	<ul style="list-style-type: none"> NEMA, 1998 Sanitation By-laws, 2003
Soil, stormwater or groundwater pollution due to the inadequate design of the ablution facilities.	2	3	M	To ensure adequate design of the ablution facilities.	<ul style="list-style-type: none"> The planning phase must determine the requirements for ablution facilities at the facility, in terms of the number of people that will be working at the facility. Adequate ablution facilities must then be provided for. 	Before construction commences	<ul style="list-style-type: none"> NewGX Recycling facility designer/engineer 	1	2	L	<ul style="list-style-type: none"> NEMA, 1998



<ul style="list-style-type: none"> Delays due to poor planning. Legal non-compliances to the Waste Management Licence and EMP. Harm to the environment. 	3	3	M	<p>To ensure pro-active planning for the construction phase of the upgrade of the recycling facility.</p>	<ul style="list-style-type: none"> Obtain a Waste Management License before commencing with the construction phase of the proposed project. Obtain permission from the local municipality for the discharge of wastewater into the municipal sewage disposal system, if required. The approved EMP and Waste Management Licence must be binding on the construction contractor and included in the tender documentation and contracts. Adequate planning and scheduling of the construction activities to allow for disruptions caused by rain and wet conditions. The scheduling must make provision for environmental training/awareness raising for workers prior to the commencement of construction. Records of all training must be maintained. Adjacent land owners must be timeously informed that the construction phase will commence and must be kept informed of the progress throughout. Appoint an independent Environmental Control Officer (ECO) prior to the commencement of the construction phase. Ensure that a complaints register is kept at the construction site from the first day of construction. Ensure that the Waste Management Licence and EMP are kept at the construction site from the first day of construction. Source unskilled labour locally, wherever possible. A construction site plan must be compiled and approved by NewGX and the ECO. The site plan must include the location of the construction camp, toilets, stores and site office. 	Before construction commences	<ul style="list-style-type: none"> NewGX Recycling facility designer/engineer 	1	2	L	<ul style="list-style-type: none"> NEMA, 1998
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7.3.5.2 Environment in general

Table 24: Environmental impact assessment: Environment in general

<p>Activity:</p> <ul style="list-style-type: none"> Construction activities associated with the upgrading of the recycling facility. Operational activities associated with the recycling facility. 											
<p>Aspect:</p> <ul style="list-style-type: none"> Lack of knowledge amongst workers and contractors in terms of how their actions may impact on the environment. Unauthorised access to the site. 											
<p>Nature and significance of environmental impact</p>											
<p>Project Phase Applicability</p>	<p>Planning and Design Phase</p>	X									
	<p>Construction</p>	X									
	<p>Operation</p>	X									
	<p>Decommissioning</p>										
<p>Impact Description</p>	<p>Risk rating (before mitigation)</p>			<p>Environmental Objective</p>	<p>Management / Mitigation / Monitoring Measures</p>	<p>Timeframe</p>	<p>Responsibility</p>	<p>Risk rating (after mitigation)</p>			<p>Applicable legislation / other documents</p>
	<p>Probability</p>	<p>Magnitude</p>	<p>Severity</p>					<p>Probability</p>	<p>Magnitude</p>	<p>Severity</p>	
<p>Harm to the environment in general (this includes pollution of soil and water resources, as well as harm to employees and wasteful practices in terms of resource use and waste management).</p>	3	3	M	<p>To prevent harm to the environment by educating workers and contractors.</p>	<ul style="list-style-type: none"> The contractor is to ensure that all employees, including sub-contractors and their employees, attend onsite Environmental Awareness Training prior to commencing work on site. Follow-up Environmental Awareness Training may be required from time to time as new subcontractors or crews commence work or for specific activities 	<p>Commence prior to the construction phase and also implement</p>	<ul style="list-style-type: none"> ECO Construction Contractor Facility manager 	2	2	L	<ul style="list-style-type: none"> NEMA, 1998 NEMWA, 2008 OHSA, 1993

				<p>that may potentially impact the environment.</p> <ul style="list-style-type: none"> • The contractor is to maintain accurate records of any training undertaken. • The ECO shall monitor the contractor's compliance with the requirement to provide sufficient environmental awareness training to all site staff. • All construction workers shall be issued with ID badges (if possible) and clearly identifiable uniforms. • Training is to cover all aspects of the EMP and procedures to be followed. • All employees are required to attend onsite Environmental Awareness Training prior to commencing work on site. • Follow-up Environmental Awareness Training may be required from time to time as new employees commence work or for specific activities that may potentially impact the environment. • All employees must receive training on waste management in order to identify, prevent, minimise or manage actions or behaviours that are likely to cause adverse impacts on air, water, land, fauna and flora as a result of operational activities at the facility. • Members of staff must be trained to manage all types of wastes in accordance with the provisions of any norms and standards and legislative requirements applicable to recycling, crushing and composting facilities. • The facility manager is to maintain accurate records of any training undertaken. 	<p>during the construction and operational phases.</p>				
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7.3.5.3 Fauna and Flora

The proposed development phases will not directly impact on sensitive vegetation or threatened plant species. The project property comprised mainly of transformed vegetation of low sensitivity and some secondary and disturbed grassland along its southern border. Currently, the secondary and disturbed grasslands buffer the sensitive ridge vegetation from on-site activities. Provided that no activities or edge effects related to the construction and operation of the proposed development phases are allowed to impact on the vegetation (ridge) south of the site, the development is unlikely to have a detrimental effect on the conservation of natural vegetation (Dimela Eco Consulting, 2015).

Table 25: Environmental impact assessment: Fauna and Flora

Activity:			
<ul style="list-style-type: none"> • Destruction of natural vegetation due to site clearance. • Activities associated with the construction phase of the proposed development. • Activities associated with the operational phase of the proposed development. • Consumption of waste by pests, such as rodents. 			
Aspect:			
<ul style="list-style-type: none"> • If the development encroaches into sensitive areas beyond the site, destruction of natural vegetation via for example bulldozers, additional access roads and construction camps placed within adjacent sensitive vegetation, dumping of construction wastes. During the operation phase, potential expansion due to a need for storage space or access roads. • Construction and operational activities could cause edge effects on the adjacent sensitive vegetation. Edge effects include possible vehicle access, impacts from pedestrians, dumping due to broken fences, recycling material blown from the site towards the ridge etc. • On site activities can lead to the spread of alien invasive plant species from the site to the adjacent natural vegetation, especially if the natural vegetation becomes disturbed. In addition, exotic plant species used in the landscaping of the site may spread into the adjacent natural vegetation. The major weed <i>Campuloclinium macrocephalum</i> (pom-pom weed) was noted on the site and can quickly become invasive in natural vegetation. • Movement of construction vehicles, machinery, delivery vehicles and personnel on site. • The use of poison to control pests. 			
Nature and significance of environmental impact			
Project Phase Applicability	Planning and Design Phase	X	
	Construction	X	
	Operation	X	
	Decommissioning		



Impact Description	Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
<ul style="list-style-type: none"> Impact description: Destruction of natural, sensitive vegetation (beyond the site's boundaries). Extent of impact: Local (sensitive vegetation south of the site boundary). Duration of impact: Lasting during the construction phase and a possibility of extending into the operational phase and for the duration thereof. Degree to which impact can be reversed: Not reversible if destruction/clearing of vegetation occurs. Grassland rehabilitation is costly and time consuming and rarely successful in reaching the original species diversity. Significance of impact: High significance: The impact is of major importance and mitigation is essential. Failure to mitigate, with the objective of preventing this impact, could render the entire development option or entire project proposal unacceptable. Degree to which impact may cause irreplaceable loss: The vegetation on the ridge is situated in an area classified as Important to reach the Gauteng conservation targets, as well as being situated in a critically endangered ecosystem. Destruction of the vegetation will cause irreplaceable loss to this ecosystem and potential loss of threatened species. Mitigation possibility: Mitigation is feasible. If mitigation measures are strictly implemented and adhered to, it is possible that there will be no resulting impact. 	3	3	M	Prevent access to and impacts on adjacent sensitive vegetation (outside of the project development footprint).	<ul style="list-style-type: none"> No roads, fences, storage, future expansion etc. should be planned beyond the site boundary (project property). Retain as much secondary and disturbed grassland as possible, to act as a buffer between the site and adjacent sensitive vegetation. Retain indigenous trees on the site. An independent Ecological Control Officer (ECO) should be appointed to oversee construction. A boundary wall/fence must be constructed prior to development of the various phases. The wall construction activity may not exceed the current disturbed footprint of the site. The construction activities and all related impacts such as camps and storage areas, should be restricted to the transformed vegetation. Prohibit vehicular or pedestrian access into natural areas beyond the site. No open fires or harvesting of trees for firewood is permitted. Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority. Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area within the site. Any contravention of these measures e.g. clearing of vegetation, must immediately be stopped and corrective action taken in consultation with the ECO and GDARD. 	Commence during the planning and construction phases.	<ul style="list-style-type: none"> ECO Construction Contractor Facility manager 	2	2	L	<ul style="list-style-type: none"> NEMA, 1998 NEMBA, 2004
<ul style="list-style-type: none"> Impact description: Deterioration of sensitive vegetation due to edge effects. Extent of impact: Local (sensitive vegetation south of the site boundary). Duration of impact: Lasting during the construction phase and a possibility of extending into the operational phase and for the duration thereof. Degree to which impact can be reversed: Must be prevented, but can be reversed with human intervention, if immediate action is taken. If degradation is allowed to proceed, the impact may become irreversible. Significance of impact: Medium: the impact is of importance and is therefore considered to have a negative impact. Mitigation is required to prevent the negative impacts. Degree to which impact may cause irreplaceable 	3	3	M	To prevent edge effects into the adjacent sensitive vegetation.	<ul style="list-style-type: none"> The boundary wall/fence must be monitored to ensure that the fence is in proper order. No dumping of any material (including garden refuse) may take place over the fence. All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction. There must be no vehicular or pedestrian access to the south of the site. Ensure that waste from the site is not carried over the fences by the wind. A planted hedge could be used to trap waste. The hedge should comprise indigenous species that occur naturally in the area such as <i>Euclea crispa</i> and <i>Searsia leptodictya</i>. Allow natural fires to burn across the vegetation, except if infrastructure and lives are threatened. 	Commence during the construction phase.	<ul style="list-style-type: none"> ECO Construction Contractor Facility manager 	2	2	L	<ul style="list-style-type: none"> NEMA, 1998 NEMBA, 2004



<p>loss: The vegetation on the ridge is situated in an area classified as Important to reach the Gauteng conservation targets, as well as being situated in a critically endangered ecosystem. Deterioration of the vegetation caused by edge effects from the development could result in irreplaceable loss in the long term.</p> <ul style="list-style-type: none"> • Mitigation possibility: Mitigation is both feasible and possible. If mitigation measures are strictly implemented and adhered to, it is possible that there will be no resulting impact. 											
<p>The majority of invasive species observed during the Vegetation Assessment were recorded in the transformed vegetation areas. Many of these are classified as category 1b invasive species. A few individuals of the major invasive weed <i>Campuloclinium macrocephalum</i> (pom-pom weed) were noted in the secondary and disturbed grassland, from where this species could likely and quickly spread to the rocky grasslands. The category 1b species on the site could spread to the ridge to the south of the site.</p> <ul style="list-style-type: none"> • Impact description: Spread of alien invasive plant species from the transformed site to the natural vegetation that will result in the deterioration of the sensitive ridge vegetation. • Extent of impact: Local (sensitive vegetation south of the site boundary). • Duration of impact: Lasting during the construction phase and a possibility of extending into the operational phase and for the duration thereof. • Degree to which impact can be reversed: Must be prevented, but can be reversed with human intervention, if immediate action is taken and eradication and monitoring is implemented. If degradation is allowed to proceed, the impact may become irreversible. • Significance of impact: Medium: the impact is of importance and is therefore considered to have a negative impact. Mitigation is required to prevent the negative impacts. • Degree to which impact may cause irreplaceable loss: Spread of alien invasive plant species into the natural vegetation could lead to a dominance of these invasive species, which could replace the canopy or herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of natural ecosystems. Deterioration of the vegetation caused by alien invasive species spreading from the site could result in irreplaceable loss over the long term. • Mitigation possibility: Mitigation is both feasible and possible. If mitigation measures are strictly implemented and adhered to, it is possible that there will be no 	4	3	H	To remove alien invasive plant species from the site and immediate surrounds and monitor re-emergence.	<ul style="list-style-type: none"> • Alien invasive species that were identified within the site and the secondary and disturbed grassland should be removed prior to construction. By removing these species, the spread of seeds into adjacent vegetation will be prevented. • The eradication of the invasive species should take place as per an Alien and Invasive Plant Eradication and Monitoring plan that should contain the following: <ul style="list-style-type: none"> ▪ Eradication methodology, including prioritising of species and areas to be cleared on site. ▪ In particular, the tenacious weed <i>Campuloclinium macrocephalum</i> (pom-pom weed) should be eradicated prior to any disturbances. ▪ Ideally the invasive species should be removed from the whole site, even the phases that will not be undertaken immediately. In order to protect the soils, the cleared areas could be sown with an indigenous grass mix until such time as they are developed. ▪ If the entire site cannot be cleared of the invasive species, the eradication and monitoring plan should include monitoring of the boundary area and the natural vegetation south of the site and enforce the eradication of all new infestations. ▪ Eradicate all invasive species (<i>Rumex usambarensis</i> and <i>Lantana camara</i>) from the natural vegetation south of the site. ▪ All alien seedlings and saplings must be removed from the site/adjacent vegetation as they become evident for the duration of construction. ▪ Manual/mechanical removal is preferred to chemical control. • All construction vehicles and equipment, as well as construction material, should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access onto the construction areas. This should be verified by the ECO. • No alien invasive plant species should be planted as part of landscaping within the site. The following plants are recommended for landscaping: <p>Recommended trees:</p> <p><i>Combretum molle</i> (velvet bushwillow) – semi deciduous tree (1-3m high) <i>Searsia leptodictya</i> (mountain karee) – evergreen <i>Cussonia spicata</i> (cabbage tree/kielpersol) – evergreen <i>Dombeya rotundifolia</i> (wild pear/drolpeer) – deciduous tree up to 5m <i>Olea europea</i> subsp <i>africana</i> (wild olive/olienhout) <i>Combretum erythrophyllum</i> (rivier vaderslandswilg/river bushwillow)</p> <p>Recommended tree/shrubs, especially for perimeter planting or to screen</p> 	Commence prior to the construction phase.	<ul style="list-style-type: none"> • ECO • Construction Contractor • Facility manager 	2	2	L	<ul style="list-style-type: none"> • NEMA, 1998 • NEMBA, 2004

resulting impact.					<p>areas: <i>Euclea crispata</i> (Ghwarrie), <i>Searsia lancea</i> or <i>Searsia leptodictya</i> (karee species), <i>Gymnosporia polyacantha</i> (kraalpendoring/kraal spike-thorn), <i>Grewia occidentalis</i> (raisin bush/kruisbessie)</p> <p>Lawns Due to the invasive properties of <i>Pennisetum clandestinum</i> (kikuyu), this grass is not recommended. This grass can easily spread into surrounding natural vegetation and should thus not be used around the perimeter. In addition, seeds of this grass may also spread from the site. The indigenous <i>Cynodon dactylon</i> (couch grass/kweek gras) or any of its varieties are recommended.</p> <p>Water retention dam <i>Typha capensis</i> (bulrush) <i>Imperata cylindrica</i> (Cotton Wool Grass) and <i>Cynodon dactylon</i> (Couch Grass), <i>Hemarthria altissima</i> (red swamp grass) and sedges such as <i>Cyperus latifolius</i></p>						
Disturbance and displacement of fauna species onsite.	3	3	M	To minimise the disturbance of fauna species onsite.	<ul style="list-style-type: none"> Site workers and contractors should ensure that no animals are disturbed, trapped, hunted or killed. Access to suitable and sensitive habitats of faunal species (the ridge to the south of the site) should be restricted. All outside lighting should be directed away from sensitive areas (the ridge to the south of the site) towards the interior of the project site. Fluorescent and mercury vapour lighting should be avoided. Sodium vapour lights should rather be used as far as possible. 	During the construction and operational phases.	<ul style="list-style-type: none"> ECO Construction Contractor Facility manager 	2	2	L	<ul style="list-style-type: none"> NEMA, 1998
The use of poison to control pests negatively impacts upon untargeted animals such as birds, cats and dogs.	3	3	M	To effectively control pests without negatively impacting upon untargeted fauna species.	<ul style="list-style-type: none"> Implement good housekeeping practices and clean waste offloading areas daily. Regularly clean waste storage containers. Implement biological or mechanical pest control programmes. The placement of owl boxes can attract barn owls to the site for biological control of rodents. Mechanical rodent traps can also be used. 	During the operational phase.	Facility manager	2	2	L	<ul style="list-style-type: none"> NEMA, 1998

7.3.5.4 Topsoil and erosion

Table 26: Environmental impact assessment: Topsoil and erosion

<p>Activity:</p> <ul style="list-style-type: none"> Scheduling the construction phase of the proposed project. Site clearance. Stockpiling of topsoil and cleared vegetation. Landscaping, replacement and levelling of subsoil and topsoil and re-vegetation. Vegetation establishment as part of rehabilitation. Operation of the upgraded recycling facility.
<p>Aspect:</p> <ul style="list-style-type: none"> Construction activities scheduled during summer months (raining season). Prolonged exposure of cleared areas (areas that are bare and devoid of vegetation). Ineffective topsoil removal and storage. Topsoil being exposed to the elements. Incorrect replacement and levelling of subsoil and topsoil. Inadequate concurrent rehabilitation and unsatisfactory establishment of vegetation. Incorrect management of stormwater runoff.



Nature and significance of environmental impact												
Project Phase Applicability	Planning and Design Phase	X										
	Construction	X										
	Operation	X										
	Decommissioning											
Impact Description	Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents	
	Probability	Magnitude	Severity					Probability	Magnitude	Severity		
Degradation and loss of a valuable resource (topsoil) through increased runoff as stormwater flows over cleared, bare areas during rainfall events.	4	2	M	To prevent the degradation and loss of topsoil.	<ul style="list-style-type: none"> If possible, schedule construction activities for dry months (winter). 	Complete prior to the start of the construction phase.	<ul style="list-style-type: none"> Construction contractor NewGX 	3	1	L	<ul style="list-style-type: none"> NEMA, 1998 	
Degradation and loss of a valuable resource (topsoil). Changes to surface characteristics, such as the removal of vegetation and soil compaction result in increased runoff and decreased infiltration of water. Increased runoff leads to erosion and the loss of topsoil.	3	3	M	To reduce the duration and extent of exposure of topsoil to preserve it as a resource and protect it from erosion.	<ul style="list-style-type: none"> Topsoil (top 150mm), where still present, is to be stockpiled in discrete areas and retained for future landscaping efforts. Any sub-soil or rocks removed should also be stockpiled separately and be used during the rehabilitation phase. Cleared indigenous vegetation should be used as a brush pack on topsoil stockpiles for erosion prevention. Minimise the length and steepness of slopes. If sterilisation of the topsoil has occurred during stockpiling, fertilisers may be used to supplement the soils before seeding of the area takes place. Replace topsoil concurrent with construction, whenever possible. Cordon off areas under rehabilitation using danger tape. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. Aim to replace stockpiled topsoil to its original depth. Topsoil should be returned to the same area from where it was stripped. If there is not enough topsoil available from a particular soil zone, topsoil of a similar quality may be used to replace it. Compacted soil should be ripped to ensure effective re-vegetation. Re-vegetation using indigenous grass species. If areas show no specific vegetation growth within three months, areas shall receive additional topsoil, be ripped to a depth of 100mm and re-planted. Soil stabilising measures could include rotovating in straw bales (at a rate of 1 bale/20m²), applying mulching or brush packing, or creating windbreaks using brush or bales. 	During the construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Construction contractor ECO. 	2	2	L	<ul style="list-style-type: none"> NEMA, 1998 	
Erosion of cleared areas. Changes to surface characteristics, such as the removal of vegetation and soil compaction result in increased runoff and decreased infiltration of water. Increased runoff leads to erosion and the loss of topsoil.	4	3	H	To minimise the duration of exposure of cleared areas and to limit erosion of subsoil.	<ul style="list-style-type: none"> The contractor is to ensure that all reasonable measures are taken to limit erosion during the construction phase. Erosion protection measures include sand bags, cut-off drains and/or berms. Placement of erosion prevention structures such as cement, rock or vegetation (grass) to reduce water velocity at concentration points within the drainage system, if required. Cleared indigenous vegetation can be stockpiled for possible reuse in later rehabilitation or landscaping, or as a brush pack for erosion prevention. Removal of vegetation is to be avoided until such time as soil stripping is required. 	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Construction contractor ECO 	3	2	M	<ul style="list-style-type: none"> NEMA, 1998 	



<p>Ineffective rehabilitation causing soil erosion and the generation of dust.</p>	<p>3</p>	<p>3</p>	<p>M</p>	<p>To ensure proper replacement of subsoil and topsoil to promote effective rehabilitation of disturbed areas.</p>	<ul style="list-style-type: none"> • Replacement and rehabilitation should be progressive during the project and not left until the end. • Implementation of effective and sustainable rehabilitation and remediation practices. • Cordon off areas under rehabilitation using danger tape. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. • Disturbed areas must be cleared of any building rubble or other debris. • All weeds must be removed prior to soil replacement. • Subsoil must be used to fill in excavations around the recycling facility and associated infrastructure. • The disturbed area must be top-soiled, sloped and re-vegetated as soon as possible using indigenous grass species. • If sterilisation of the topsoil has occurred during stockpiling, fertilisers may be used to supplement the soils before seeding of the area takes place. • Aim to replace stockpiled topsoil to its original depth. • Topsoil should be returned to the same area from where it was stripped. • If there is not enough topsoil available from a particular soil zone, topsoil of a similar quality may be used to replace it. • Compaction must be minimised by using the correct equipment. Excessively heavy vehicles should not be used to replace the soil. A dozer must be used instead of a grader. • Compacted soil should be ripped to ensure effective re-vegetation. • Soils should ideally only be moved when dry. • Soil stabilising measures could include rotovating in straw bales (at a rate of 1 bale/20m²), applying mulching or brush packing or creating windbreaks using brush or bales. • Re-vegetated areas should be continuously monitored to verify whether the vegetation is growing and covering bare areas. • If areas show no specific vegetation growth within three months, areas must receive additional topsoil, be ripped to a depth of 100mm and re-planted. • Fertilisers can also be used to promote growth of vegetation. 	<p>Before completion of the construction phase.</p>	<ul style="list-style-type: none"> • Construction contractor • ECO 	<p>2</p>	<p>2</p>	<p>L</p>	<ul style="list-style-type: none"> • NEMA, 1998
<p>Soil erosion due to improper management of stormwater onsite.</p>	<p>4</p>	<p>3</p>	<p>H</p>	<p>To ensure adequate stormwater management and to prevent soil erosion.</p>	<ul style="list-style-type: none"> • It is the responsibility of the applicant to ensure that storm water control measures are designed and constructed to be capable of withstanding the maximum design flood. It should be taken into consideration that the potential for erosion increases where the surface runoff is concentrated and must be addressed within the designs. Designs should incorporate gradual drainage to avoid siltation of storm water infrastructure. • The site must have an adequate and effective stormwater management system in place. • Stormwater measures should be inspected on a regular basis in order to ensure that the structures are functional and not causing soil erosion. • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from the recycling and related activities. 	<p>Life of operation</p>	<p>Facility Manager</p>	<p>1</p>	<p>3</p>	<p>L</p>	<ul style="list-style-type: none"> • NEMA, 1998 • NWA, 1998

7.3.5.5 Soil, surface water, stormwater and groundwater

Table 27: Environmental impact assessment: Soil, surface water, stormwater and groundwater

<p>Activity:</p> <ul style="list-style-type: none"> • The handling, storage, mixing and disposal of cement and concrete.
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- The cleaning of equipment and construction areas.
- Handling, storage and disposal of general, domestic and hazardous waste.
- Installation and use of ablution facilities.
- Storage and handling of hazardous chemical substances including fuel, greases and oils. Vehicle and equipment maintenance and fuelling.
- Stormwater runoff on site.
- The release of treated wastewater into the municipal sewage system.
- The pumping of sewage off site into the municipal sewage system.
- The storage of waste tyres and rubber crumbs.
- The operation of the composting facility.

Aspect:

- Incorrect management, storage and disposal of concrete and cement.
- Incorrect management and disposal of contaminated wash water or wastewater.
- Spillages from cleaning equipment used for construction (e.g. cement mixers).
- Incorrect management, storage and disposal of construction waste, general waste and hazardous waste.
- Unsanitary conditions on site.
- Poor management and spills of hazardous chemical substances, fuel, greases and oils. Leaking equipment or vehicles and/or spillage of fuels, greases and oils.
- Incorrectly managed stormwater runoff and contamination of stormwater runoff.
- The release of wastewater of unsuitable quality into the municipal sewage system.
- Leaking or broken sewage pipes.
- Incorrect storage of waste tyres and rubber crumbs.
- Waste leachate from the composting facility.

Nature and significance of environmental impact

Project Phase Applicability	Planning and Design Phase	X										
	Construction	X										
	Operation	X										
	Decommissioning											
Impact Description	Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents	
	Probability	Magnitude	Severity					Probability	Magnitude	Severity		
Soil and surface water pollution due to the incorrect management of cement and concrete.	3	3	M	To prevent the pollution of soil and surface water as a result of spillage, improper handling, storage, mixing or disposal of cement and concrete.	<ul style="list-style-type: none"> • Cement may only be mixed in a designated area. • Dry cement must be removed from the soil surface to prevent an impermeable layer forming on top of the soil. The cement must be disposed of together with any building rubble. • Ready-mix trucks are not permitted to clean chutes on site. Cleaning into foundations or a dedicated cleaning pit is permitted. • Bricklayers and plasterers are to minimise any cement spill or runoff in their work area and are to ensure that the work area is cleaned of all cement spillage at the end of each workday. • Both used and unused cement bags are to be stored in weatherproof containers so as not to be affected by rain or runoff. • Contaminated soil resulting from concrete or cement spills is to be removed immediately after the spillage has occurred and placed on the appropriate rubble stockpile. • Runoff from the washing out of wall cavities is to be contained against the building by excavations or berms around the foundations. All reasonable measures must be taken to prevent the dirty water from contaminating a watercourse. 	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> • Construction contractor • ECO 	2	2	L	<ul style="list-style-type: none"> • NEMA, 1998 	



<p>Soil and surface water pollution due to the release of contaminated wash water into the environment.</p>	<p>2</p>	<p>3</p>	<p>M</p>	<p>To prevent the pollution of soil and surface water bodies, through contaminated wash water. An example of this would be water that is contaminated with cement or concrete.</p>	<ul style="list-style-type: none"> No washing of construction vehicles is permitted on site. A dedicated temporary cleaning area is to be identified to facilitate washing of all cement and painting equipment. The cleaning area could be a plastic lined cleaning pit or dedicated plastic or metal drums, located as close as possible to a water point. No wastewater/wash water may be disposed of on site, onto the soil or into any water body. Runoff from the washing activities is to be contained against the building by excavations of berms around the foundations. 	<p>During construction phase, up until operation of the facility.</p>	<ul style="list-style-type: none"> Construction contractor ECO 	<p>2</p>	<p>2</p>	<p>L</p>	<ul style="list-style-type: none"> NEMA, 1998
<p>Soil, surface water and groundwater pollution from incorrect waste management practices. Nuisance caused by odours and unsightly appearance of waste onsite.</p>	<p>3</p>	<p>3</p>	<p>M</p>	<p>To prevent soil, surface and groundwater pollution and nuisance due to poor waste management.</p>	<ul style="list-style-type: none"> Building and demolition waste must be disposed of at a licensed landfill site or recycling facility. Installation of sufficient waste bins, skips or bulk containers. Containers must be present on site at all times. 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. Waste material may only be temporarily stored at areas demarcated for such storage practices. General waste shall be stored in a manner that prevents the harbouring of pests. General waste materials should always be stored or disposed of separately from hazardous waste material (e.g. oil rags). General and hazardous waste can be deposited into appropriately demarcated bins at the construction activities. Bins are then emptied into appropriately demarcated skips or bulk containers at the end of each day or more often if required. Waste must be collected regularly to prevent its accumulation on site. New waste storage areas/facilities must be registered with the competent authority within ninety (90) days prior to construction taking place. The location of the waste storage facility must be in accordance with GNR. 926 of 29 November 2013 [National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): National Norms and Standards for the storage of waste]. The design of the waste storage facility must be conducted in accordance with GNR. 926 of 29 November 2013. Waste storage facilities must have correct access control and signage as stipulated in GNR. 926 of 29 November 2013. Waste storage facilities must be operated as stipulated in GNR. 926 of 29 November 2013. All waste storage containers must comply with the conditions as stipulated in GNR. 926 of 29 November 2013. Training must be provided continuously to employees working with waste. The training programme must include the provisions stipulated in GNR. 926 of 29 November 2013. An Emergency Preparedness Plan must be compiled in accordance with GNR. 926 of 29 November 2013. Monitoring, auditing, reporting and record keeping must be conducted in accordance with GNR. 926 of 29 November 2013. Installation of sufficient waste bins, skips or bulk containers. The design of the bins, skips or bulk containers must ensure containment to prevent seepage, must 	<p>During the construction and operational phases.</p>	<ul style="list-style-type: none"> Construction contractor ECO Facility manager 	<p>2</p>	<p>2</p>	<p>L</p>	<ul style="list-style-type: none"> NEMA, 1998 NEM:WA, 2008



					<ul style="list-style-type: none"> be covered to prevent water ingress and must be placed on impermeable surfaces within bunded areas. 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. 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. Skips or bulk containers should be removed to a licensed landfill site on a regular basis. No build-up of waste is permitted onsite. Safe disposal certificates should be requested from general and hazardous landfill sites with every waste disposal. Waste may only be disposed of at a licensed landfill in accordance with the Norms and Standards for Disposal to Landfill as stipulated in Section 7(1)(c) of the NEMWA, 2008. Safe disposal certificates should be kept on file to illustrate compliance with the cradle to grave principle. Hazardous waste may only be handled by a registered waste disposal company. Any waste generated at the facility must be classified in terms of GNR. 634 of 23 August 2013 (National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): Waste Classification and Management Regulations), except where the waste is listed under Annexure A of GN. 634. Safety data sheets must be obtained or prepared for any hazardous waste generated at the facility, as stipulated in GNR. 634 of 23 August 2013. All waste storage containers must be labelled, as stipulated in GNR. 634 of 23 August 2013. Detailed records must be kept of all waste generated, as stipulated in GNR. 634 of 23 August 2013. This includes the classification of the waste, quantities of waste generated and re-used, recycled, recovered, treated or disposed of (in tons or m³ per month), and by whom the waste was managed. Waste manifest documents must be compiled for any hazardous waste generated onsite, as stipulated in GNR. 634 of 23 August 2013 (specifically Annexure 2). All waste transporters must also complete waste manifest documents for each load of waste transported, as stipulated in GNR. 634 of 23 August 2013 (specifically Annexure 2). Waste manifest documentation must be retained for a period of at least five (5) years. No incineration of any kind of waste will be permitted onsite. 						
Soil, surface water and groundwater pollution as a result of unsanitary conditions onsite.	2	3	M	Prevent soil, surface and groundwater pollution from unsanitary conditions onsite.	<ul style="list-style-type: none"> Sufficient ablution facilities shall be provided – minimum of 1 toilet per 10 workers. The ablution facilities must be on impermeable surfaces. The location of toilets shall be located within 100m of any work point. Ablating anywhere other than in the toilets shall not be allowed. Any temporary ablution facilities are to be secured to avoid them from blowing or falling over. The contractor shall ensure that any chemicals and/or waste from the ablution facilities are not spilled on the ground at any time. Ablution facilities are to be serviced weekly or more frequently if required. The contractor is to ensure that no spillage occurs and that the contents are removed from site on a regular basis. 	During the construction and operational phases.	<ul style="list-style-type: none"> Construction contractor ECO Facility manager 	1	3	L	<ul style="list-style-type: none"> NEMA, 1998



					<ul style="list-style-type: none"> • Ablution facilities shall be inspected and maintained to prevent and minimise blockage and leakages. • Toilets should have properly closing doors and be supplied with toilet paper. • Awareness of the importance of proper hygiene should be created among employees. • Undertake regular groundwater studies to determine the impact of the recycling facility on the groundwater resource. 							
Chemical and hydrocarbon pollution of soil, stormwater and groundwater due to the chemical-, fuel-, grease- or oil spillages or leaking equipment and vehicles.	3	3	M	<p>To prevent and minimise soil and water pollution as a result of poor management and accidental spills of hazardous chemical substances, fuel, greases and oils used onsite, including from leaking equipment or vehicles.</p>	<ul style="list-style-type: none"> • Identify all hazardous chemical substances used onsite including fuel, greases and oils. • Obtain the material safety data sheet of each of hazardous chemical substance. • Ensure that the material safety data sheets have sufficient information to enable the user to take the necessary measures to protect his/her health and safety and that of the environment. • Material Safety Data Sheets for all hazardous chemical substances must be readily available on site. • Keep a stock inventory register of all chemicals in the store. • Powders must be stored above liquids. • Proper storage of chemicals in a lockable, well ventilated building. • Ensure adequate access control for the storage area. • Storage areas for hazardous chemicals are to comply with standard fire safety regulations. • Safety signage including “No Smoking”, “No Naked Lights” and “Danger”, and product identification signs, are to be clearly displayed in areas housing chemicals. • Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. • Chemicals are to be properly labelled and handled in a safety conscious manner. • All personnel handling hazardous chemicals and hazardous materials are to be issued with the appropriate Personal Protective Equipment (PPE). • The removal of only the daily-required amount of chemicals to be used from the shed. • If refuelling on site or from drums, the ground must be protected and proper dispensing equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. • Drip trays are to be utilised during greasing and re-fuelling of machinery or equipment and to contain incidental spills and pollutants. Drip trays should be emptied into secondary containers on a regular basis. • Ensure that any spilled chemical cannot exit the designated storage area by constructing a berm or bump at the exit, or store chemicals in a spill tray. • Immediately clean all spillage of fuels, lubricants and other petroleum based products. • No hazardous chemical may be discarded in the sewage or stormwater system. • Train staff on the use of chemicals in accordance with the risks as described in the material data sheets. • After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use. 	During the construction and operational phases.	<ul style="list-style-type: none"> • Construction contractor • ECO • Facility manager 	1	3	L	<ul style="list-style-type: none"> • NEMA, 1998 	



				<ul style="list-style-type: none"> • Ensure that maintenance work does not take place haphazardly, but, according to a fixed plan, from one area to the other. • Maintenance of construction vehicles. • Inspection and maintenance of equipment and vehicles owned by NewGX shall take place on a regular basis. • Equipment and vehicles are to be repaired immediately upon developing leaks. • Drip trays shall be supplied for all repair work undertaken on machinery on site. • Drip trays are to be inspected daily for leaks and effectiveness and emptied when necessary. This is to be closely monitored during rain events to prevent overflow. • Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site. 							
<p>Soil and surface water pollution due to the contamination of clean stormwater runoff.</p> <p>A Stormwater Management Plan has been compiled to ensure effective management of clean stormwater runoff at the recycling facility.</p>	3	3	M	<p>To prevent the contamination of 'clean' stormwater in 'dirty' areas through effective control of stormwater runoff.</p>	<p>The following mitigation measures have been extracted from the Stormwater Management Plan for the recycling facility and correspond to the figures below.</p> <p>Phases 1A and 1B</p> <p>1. The first recommendation is to implement a storm water channel along the cut-off berm to divert runoff around the MRF, associated buildings and storage areas (Phases 1a and 1b of the project). Two types of channels are recommended: parabolic channels and/or trapezoidal. The storm water conveyance channel should link up with the existing municipal storm water channel (concrete trapezoidal channel) in which runoff will follow the slope in an eastern direction.</p> <p>The channel should be designed so that the velocity of flow expected from the design storm does not damage the type of lining used. Different channel linings can be considered in accordance to the expected runoff velocity. As per the modelling, it is recommended to use riprap due to the fact that the expected velocity exceeds 1.8 m³/s. The hilly terrain situated south of the proposed recycling facility will induce runoff velocities that, most often, grass lined channels won't work effectively and riprap will be needed instead.</p> <p>Another consideration could be to use a permanent diversion dike or swale intended to divert overland sheet flow to a stabilised outlet or a sediment trapping facility during the establishment of a site. The dyke/swale can be used instead of a conveyance channel (concrete) along the proposed cut-off berm. When used at the base of a slope, as in the case of the proposed recycling facility, the structure protects adjacent and downstream areas by diverting sediment-laden runoff to a sediment trapping facility. It is recommended to stabilise the dike or swale with permanent vegetation. The slope behind the dike or swale is also an important consideration as it should prevent runoff from entering the site. Vegetated swales or dikes are often used as an alternative to, or an enhancement of, traditional storm sewer pipes. They do not pond water for a long period of time and induce infiltration. Vegetated swales or dikes generally have a trapezoidal or parabolic shape with relatively flat side slopes. The dike or swale should have a positive grade to ensure drainage in an eastern direction, from where it should link up with the municipal storm water system. This practise is considered an economical one as it uses material available on the site and can usually be constructed with equipment needed for site grading. It is recommended to apply seed or mulch within 5 days of dike/swale construction. Stabilisation should be done immediately using riprap to avoid erosion.</p> <p>2. No erosion should occur at the outlet. It is recommended to provide energy dissipation measures as necessary. Sediment-laden runoff should be released</p>	Life operation of	Facility Manager	2	2	L	<ul style="list-style-type: none"> • NEMA, 1998 • NWA, 1998

through a sediment trapping facility before entering the municipal storm water channel, thereby reducing maintenance requirements by the municipality. The measure should be inspected after every major storm and repairs made when necessary. The swale or channel chosen (lined with riprap), should reduce the velocity of concentrated flows, reducing erosion of the swale/channel and slow water velocity to allow retention of sediments.

3. Paved areas at the MRF, roofs of associated buildings to be constructed and the paved areas and roofs at the storage areas will have a considerable effect on the run-off characteristics of the catchment as it may increase the size of flood peaks by 20-50% of those under natural conditions. Storm water runoff from the MRF and associated buildings should be allowed to enter the proposed storm water conveyance channel/swale that will be located around the facility.
4. Surface runoff is also expected to report to the site as a result of the modified topography created by adjacent landfill activities. The Kwagga landfill site situated just east of the proposed recycling facility created a slope from where runoff is expected to flow towards the project site. By implementing the proposed measures, the runoff should be intercepted by the proposed channel/swale around the eastern perimeter of the facility and convey runoff towards the sediment trap (outlet) from where it will enter the municipal storm water channel.



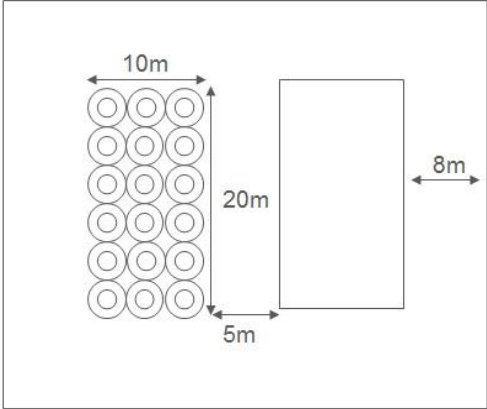
				<p>Phases 2 and 3</p> <ol style="list-style-type: none"> 1. A proposed storm water conveyance channel or a swale/dike will divert clean runoff originating from the ridge situated south of the facility. Refer to full discussion within Table 3 of the SWMP for considerations when implementing such a storm water measure. 2. Affected runoff from the composting areas/plastic wrapped baled refuse storage should be contained within a dirty water containment facility. Affected water contained within the facility can be re-used in the composting process. The containment facility should be lined to limit seepage into the ground. It is recommended to fit the containment facility with a suitable spillway to prevent failure during a flood emergency. 3. The proposed berm along the northern perimeter of the compost/plastic wrapped baled refuse storage area will isolate the dirty water area from the adjacent municipal storm water channel. Investigations should take place to determine the necessity of constructing lined leachate conveyance channels towards the leachate collection pond. 4. Heavy rainfall may wash some of the composting materials into the proposed leachate conveyance channels towards the containment facility. Therefore, a screen should be installed at the inlet of the leachate collection pond to prevent debris from entering the facility and thereby reducing maintenance requirements. During a 1:50 year 24 hour flood, an expected amount of 2 833.831m³ will be generated from the impermeable composting area. In order to contain this amount of water, a facility with dimensions 32m x 32m x 3m deep would be required. It is further recommended to conduct surface water quality monitoring within the containment facility to determine the risk of affected water release from the site. 					
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<p>The release of treated wastewater into the municipal sewage system and compromising the municipal system's efficiency.</p>	3	3	M	<p>To ensure responsible release of treated wastewater/effluent into the municipal sewage disposal system/sewer system.</p>	<ul style="list-style-type: none"> Should it be desired for treated wastewater to be discharged into the municipal sewage disposal system, permission must be obtained from the City of Tshwane Metropolitan Municipality in terms of Section 33 of the Sanitation By-laws, 2003. All the requirements and conditions contained in the Sanitation By-laws, 2003, must be adhered to. Subject to the above permission, the wastewater/effluent must comply with the standards and criteria set out in Section 35(1) and Appendix A of the Sanitation By-laws, 2003. Preliminary treatment may be required to ensure that these standards and criteria are met. Subject to the above permission, the wastewater/effluent entering the municipal sewage disposal system must comply with the following [Section 35(1) of the Sanitation By-laws, 2003], unless otherwise authorised by the authorised official: <ul style="list-style-type: none"> It may not be offensive or cause a nuisance to the public; It may not be in the form of vapour or steam or have a temperature exceeding 44°C at the point of entry to the sewer. It may not have a pH of less than 6.0 or greater than 10.0. It may not contain any substance that is likely to produce or emit explosive, poisonous, flammable or offensive vapours or gases in the sewer. 	Life of operation	Facility Manager	2	2	<ul style="list-style-type: none"> NEMA, 1998 NWA, 1998 Sanitation By-laws, 2003



					<ul style="list-style-type: none"> It may not contain a substance with a flash-point of less than 93°C or which emits a poisonous vapour at a temperature below 93°C. It may not contain any material whatsoever, including oil, grease, fat or detergents that are capable of causing interference with the proper operation of a waste-water treatment plant and the Municipality's sewer system. It may not show any visible signs of tar or associated products or distillates, bitumens or asphalts. It may not contain a substance in such concentration as is likely in the final, treated effluent from a waste-water treatment plant to produce an undesirable taste after sterilisation or an undesirable odour or colour, or excessive foam. It may not exceed any of the limits or concentrations of substances given in Appendix A of the Sanitation By-laws, provided that the Municipality may approve greater limits or concentrations for such period or on such conditions as it may specify after consideration of the effect of dilution in the sewer and of the effect of such industrial effluent or other liquid or substance on the sewer or on any sewage treatment process. It may not contain any substance which, in the opinion of the Engineer- <ul style="list-style-type: none"> (i) is not amenable to treatment at a waste-water treatment plant and which causes or may cause a breakdown or inhibition of the normal sewage treatment processes; (ii) is or may be amenable to treatment only to such degree as to prevent the final, treated effluent from the waste-water treatment plant from satisfactorily complying in all respects with any requirements imposed in terms of the Water Act; or (iii) whether listed in the relevant appendix to these by-laws or not, either alone or in combination with other matter may— <ul style="list-style-type: none"> (aa) generate or constitute a toxic substance detrimental to the health of persons who are employed at the waste-water treatment plant or who enter the Municipality's sewers or manholes in the course of their duties; (bb) be harmful to sewers, waste-water treatment plants or land used for the disposal of purified sewage effluent; or (cc) adversely affect any of the processes whereby sewage is purified or any re-use of purified sewage effluent. 						
Soil and groundwater pollution from leaking or broken sewerage pipes.	2	3	M	To prevent soil, stormwater and groundwater pollution from leaking or broken sewerage pipes.	<ul style="list-style-type: none"> Ablution facilities should be maintained to prevent or minimise blockage and leakages. Should toilets become blocked or run slowly, this should be reported and the cause investigated. This could be due to a blocked or broken pipe leading from the toilets to the sewerage system. Create employee awareness about the proper use of ablution facilities and the importance of proper hygiene. No cigarette butts, fats, oils, paper towels etc. may be disposed of into toilets or wash basins. Toilets should have properly closing doors and be supplied with toilet paper. 	Life of operation	Facility Manager	2	2	L	<ul style="list-style-type: none"> NEMA, 1998
<p>Incorrect storage of waste tyres and rubber crumbs resulting in soil, stormwater and groundwater pollution.</p> <p>Stored tyres (whole or in pieces) may leach substances into the soil if the tyres are stored on bare ground (California Integrated Waste Management Board, 1995).</p> <p>Should a fire become established at the waste tyre storage</p>	3	4	H	To ensure that the waste tyres are stored in the correct manner so as to prevent environmental pollution, due to, for example, the release of oil from burning	<ul style="list-style-type: none"> The waste tyre storage site/area must have an impermeable surface, such as a concrete slab. The waste tyres must be stored in accordance with the stipulations in GNR. 926 of 29 November 2013. The waste tyre storage site/facility must be registered within the competent authority 90 days prior to the construction phase commencing. The waste tyre storage facility must be designed in accordance with the stipulations in GNR. 926 of 29 November 2013. 	Life of operation	Facility Manager	2	2	L	<ul style="list-style-type: none"> NEMA, 1998 NEM:WA, 2008 Waste Tyre Regulations, 2009

<p>area, the burning tyres would decompose into the following:</p> <ul style="list-style-type: none"> Ash (typically containing carbon, zinc oxide, titanium dioxide, silicon dioxides); Sulphur compounds such as carbon disulfide, sulphur dioxide and hydrogen sulphide; Polynuclear aromatic hydrocarbons such as benzo(a)pyrene, chrysene, benzo(a)anthracene, etc. in the oil that is produced; Aromatic-, naphthenic- and paraffinic oils; Particulates; Various light-end aromatic hydrocarbons, such as toluene, xylene and benzene; and Oxides of nitrogen and carbon (www.mfe.gov.nz). <p>The oily runoff can be carried by water, if water is used to extinguish the fire, or by rainwater. It is estimated that the average passenger car tyre produces 7.8 litres of oil (www.epa.gov). Immediate soil pollution will be caused when the liquid decomposition products penetrate the soil. Gradual pollution of the deeper soil horizons and groundwater can also result from the leaching of ash and unburnt residues after rain events (www.mfe.gov.nz).</p>				<p>tyres.</p>	<ul style="list-style-type: none"> The waste tyre storage facility must have correct access control and signage as stipulated in GNR. 926 of 29 November 2013. The waste tyre storage facility must be operated as stipulated in GNR. 926 of 29 November 2013. In accordance with the Waste Tyre Regulations (2009), the waste tyre storage area may not exceed 30 000m². A waste tyre storage area plan must be developed. The plan must be approved by the municipal fire department and must be available onsite at all times. The site must have clearly visible signs posted near the entrance of the facility. The signs must show the operating hours, contact details and site regulations. A security attendant trained in fire prevention must be on site at all times. The site manager must be on site at all times (when the facility is open/operational). No single pile of waste tyres may exceed a height of 3 metres, a length of 20 metres or a width of 10 metres. All interior firebreaks between the waste tyre piles must be at least five metres wide. The storage area must be flat and hard packed. The site must make provision for storm water management. The edges of the waste tyre piles must be at least 8 metres from the perimeter fence and any buildings. The area between the piles and the fence and buildings must be clear of debris and vegetation. All firebreaks must be at least 8 metres wide. Waste tyre piles may not be located within 8 metres from a power line. The following diagram gives an example of the correct waste tyre storage area design.  <ul style="list-style-type: none"> The waste tyres must not be stored on steeply graded surfaces or anywhere else where they may pose a significant environmental or fire risk. The stormwater system at the site must ensure that water runoff from the waste tyre storage area is contained. This will ensure that runoff water contaminated by oil from the burning of the tyres can be contained. 						
<p>Composting processes may lead to groundwater contamination from waste leachate.</p> <p>Leachate may contain organic material, nitrates, phenols, dissolved metals and other contaminants (World Bank Group, 2007).</p>	3	3	M	<p>To prevent the contamination of groundwater from waste leachate from the composting facility.</p>	<ul style="list-style-type: none"> The areas where the compostable material will be stored and processed (composted) as well as the storage areas for the final product must be impervious to prevent leachate from percolating into the ground. Install a drainage system to contain all leachate from the composting area. A leachate treatment system should also be installed. Maintain ideal composting conditions. Bulking agents enhance the compost's water-holding capacity and thereby reduce 	<p>During the operational phase.</p>	<p>Site Manager</p>	2	2	L	<ul style="list-style-type: none"> NEMA, 1998 NWA, 1998

				leachate loss (Ulén, 1993). <ul style="list-style-type: none"> Reduce the amount of water percolating through the compost by covering the compost piles using, for example, a straw or tarpaulin cover (Ulén, 1993). Regular turning of the windrows will reduce the moisture content by bringing wetter material to the surface where it can dry (Hao & Benke, 2008). 						
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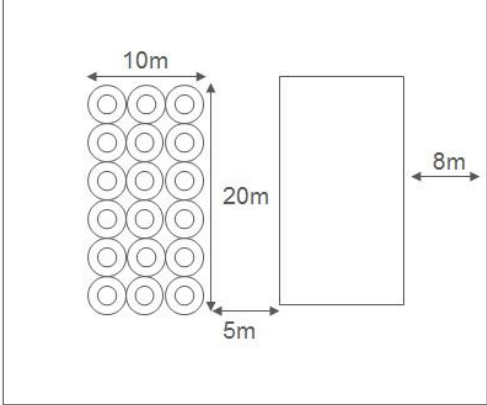
7.3.5.6 Atmosphere and Noise

Table 28: Environmental impact assessment: Atmosphere and Noise

Activity: <ul style="list-style-type: none"> Scheduling of the construction phase for the proposed project. Construction activities, including excavation activities, loading and offloading activities and vehicles travelling to and from the site. Construction workers, vehicles, machinery and general noisy construction activities on site. Operational activities, such as the receipt of incoming waste and the storage of processed waste fractions. 													
Aspect: <ul style="list-style-type: none"> Construction activities occurring during inconvenient times of the day. Construction vehicles not adhering to speed limits on the site. Noise and nuisance generated by additional construction vehicles and equipment during the construction activities. Ineffective dust suppression. Vehicle emissions released from the additional construction vehicles and equipment used during the construction phase. Vehicles not adhering to speed limits on the site. Release of atmospheric emissions from potential burning of stockpiled tyres, rubber crumbs or waste due to unsafe storage practices that result in the establishment of fires. Increased traffic flow to the site. Generation of odorous emissions from the composting processes and waste handled onsite. Noise generated from the recycling processes, such as through exterior processing equipment and vehicles travelling to and from the facility. Windblown waste/litter as a result of the incorrect management of large quantities of loose waste material. 													
Nature and significance of environmental impact													
Project Phase Applicability	Planning and Design Phase		X										
	Construction		X										
	Operation		X										
	Decommissioning												
Impact Description			Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
			Probability	Magnitude	Severity					Probability	Magnitude	Severity	
Generation of noise and nuisance to neighbours as a result of construction activities occurring during inconvenient times of the day. According to Jorgensen & Johnson (1981), the noise levels generated by general construction activities on a building site can reach levels of approximately 70dB, caused by for instance heavy machinery. It can therefore be assumed that the proposed development will have a negative impact on the environmental noise of the area once construction starts. Sound is inversely proportional to the distance from the source			3	3	M	To maintain a dB reading of less than 50dB at the site boundary and minimise nuisance to neighbours.	<ul style="list-style-type: none"> Schedule activities that will generate the most noise during times of the day that will result in least disturbance to neighbours. Site workers and contractors will adhere to the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) regarding hearing protection and noise control measures. The Gauteng Noise Control Regulations, 1999, must be adhered to. Regular maintenance of vehicles and equipment. All equipment and machinery should be fitted with adequate silencers. Select equipment with low noise emissions, where possible. Working hours should be restricted to daylight hours. No sound amplification equipment such as sirens, loud hailers or hooters are to be 	Pre-construction, construction and operational phases.	<ul style="list-style-type: none"> NewGX Construction contractor 	2	2	L	<ul style="list-style-type: none"> NEMA, 1998 OHSA, 1993 NEM:AQA, 2004 Noise Control Regulations, 1999

<p>and can get absorbed by buildings and vegetation barriers. Noise intensities (dB) will be at their highest on site and will decrease as one moves away from their sources. The noise decline curve gives an indication of how noise generated at the site will decrease with distance. It gives an indication of the distance that the sound would have travelled upon reaching a level of 60 dB, prescribed by the SABS as being the acceptable limit for environmental noise. According to noise decline curve, at a distance of 27 metres from the construction site, the generated noise would have decreased to a level of 60 dB and at a distance of 45 metres it would have decreased to approximately 55dB. It can therefore be said that noise travelling further than 45 metres will have a low impact on neighbouring farms and residential areas.</p> <p>The distance to sensitive noise receptors (residences) is more than 45 metres in all cases.</p> <p>Noise disturbance and nuisance to neighbours and other sensitive receptors due to operational activities. Noise will be generated through the recycling processes, such as through exterior processing equipment and vehicles travelling to and from the facility.</p>					<p>used on site except in emergencies and no amplified music is permitted on site.</p> <ul style="list-style-type: none"> • If work is to be undertaken outside of normal work hours permission must be obtained from the ECO and the facility manager. • No noisy work is to be conducted over the weekends or on public holidays. • Maintain roads to prevent noise and vibration from vehicles onsite. • A complaints register must be kept onsite. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how concern was addressed. 						
<p>Ambient air quality degradation as well as disturbance and nuisance to neighbours and other sensitive receptors due to dust generated from onsite traffic.</p>	3	3	M	<p>To minimise the impact of excavation activities, loading and offloading activities and vehicles travelling to and from the site on the ambient air quality.</p>	<ul style="list-style-type: none"> • A dustcart needs to be onsite to water down dusty roads. • Speed bumps or traffic speed signs need to be erected to reduce speeding onsite that could result in the generation of dust. • Regular maintenance of vehicles to address wear of tires and breaks. Optimal engine combustion will allow for 'cleaner' exhaust emissions. • If the soil is compacted, open areas should be ripped, fertilised and re-vegetated as soon as possible using suitable grass species (indigenous seed mix). • A complaints register must be kept onsite. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how concern was addressed. 	<p>During the construction and operational phases.</p>	<ul style="list-style-type: none"> • Construction contractor • Facility Manager • ECO 	2	2	L	<ul style="list-style-type: none"> • NEMA, 1998 • NEM:AQA, 2004
<p>Release of atmospheric emissions from potential burning of stockpiled tyres, rubber crumbs or waste due to unsafe storage practices that result in the establishment of fires.</p>	3	4	H	<p>To minimise the likelihood of fire establishment at the recycling facility.</p>	<ul style="list-style-type: none"> • At the composting facility, avoid conditions that can result in spontaneous combustion (temperatures higher than 93°C and moisture content of between 25-45%). Keep windrows less than 3m high and turn when the temperatures reach 60°C. • Install sufficient firefighting equipment at strategic points at the recycling facility. • The waste tyre storage facility must be designed in accordance with the stipulations in GNR. 926 of 29 November 2013. • The waste tyres must be stored in accordance with the stipulations in GNR. 926 of 29 November 2013. • The waste tyre storage facility must be operated as stipulated in GNR. 926 of 29 November 2013. • In accordance with the Waste Tyre Regulations (2009), the waste tyre storage area may not exceed 30 000m². • A waste tyre storage area plan must be developed. The plan must be approved by the municipal fire department and must be available onsite at all times. • The site must have clearly visible signs posted near the entrance of the facility. 	<p>During the operational phase.</p>	<p>Site Manager</p>	2	2	L	<ul style="list-style-type: none"> • NEMA, 1998



					<p>The signs must show the operating hours, contact details and site regulations.</p> <ul style="list-style-type: none"> • A security attendant trained in fire prevention must be on site at all times. • The site manager must be on site at all times (when the facility is open/operational). • No single pile of waste tyres may exceed a height of 3 metres, a length of 20 metres or a width of 10 metres. • All interior firebreaks between the waste tyre piles must be at least five metres wide. • The edges of the waste tyre piles must be at least 8 metres from the perimeter fence and any buildings. The area between the piles and the fence and buildings must be clear of debris and vegetation. • All firebreaks must be at least 8 metres wide. • Waste tyre piles may not be located within 8 metres from a power line. • The following diagram gives an example of the correct waste tyre storage area design.  <ul style="list-style-type: none"> • The waste tyres must not be stored on steeply graded surfaces or anywhere else where they may pose a significant environmental or fire risk. 					
<p>Generation of atmospheric emissions, odours and nuisance to neighbours due to activities at the recycling facility, and in particular, at the composting facility.</p> <p>The final product from the process (compost) can be stored and applied to the soil with little to no odour, pathogen, weed or fly breeding potential (Zhao <i>et al.</i>, 2008).</p>	3	3	M	<p>To minimise the generation of odours at the recycling, and in particular at the composting facility, to thereby minimise the nuisance to neighbours.</p>	<ul style="list-style-type: none"> • Install extraction systems in all waste processing buildings, specifically to remove dust. • Consider the use of negative pressure in processing buildings. • Reasonable measures must be put in place to minimise odour emissions from the composting site. Should no effective preventative measures exist, provision must be made for the processing and storage of the waste in enclosed storage and processing facilities. • Emissions of biogas in aerobic processes must be controlled by keeping the organics adequately aerated. • Maintain a minimum oxygen content of at least 5%, by volume, in the free air space of every active and curing compost pile. Each compost pile must be tested at least once a week to determine the oxygen content. • Maintain the moisture content of every active and curing compost pile between 45% and 60%, by weight. The moisture content must be tested every day that the pile is turned to determine the moisture content. • Manage every active compost pile such that the initial carbon to nitrogen ratio is at least 25:1. The ideal C:N ratio is between 25:1 and 30:1. • Compost stockpiles and windrows must regularly be turned to ensure that they have sufficient moisture contents. The piles should, however, not be turned more than required, as this stimulates aerobic decomposition processes and leads to elevated NH₃ emissions (Parkinson <i>et al.</i>, 2004). 	<p>During the construction and operational phases.</p>	Site Manager	2	2	<p>L</p> <ul style="list-style-type: none"> • NEMA, 1998 • NEM:AQA, 2004

					<ul style="list-style-type: none"> • Use windrow turning equipment designed to minimise air emissions. Wheeled loaders or conveyors that drop waste onto windrows are not ideal. • Cover all active compost piles within 3 hours of each turning with one of the following: a waterproof covering, a layer of finished compost or soil. • Covering the piles has been shown to reduce air exchange and therefore NH₃ emissions (Gottschall & Vogtmann, 1988). • Enclose leachate collections systems to reduce odour emissions. • The quantities of incoming and processed organics must not exceed the design requirements of the storage and processing areas. • Good housekeeping measures must be implemented. • Waste offloading areas should be cleaned daily. • Deodorising systems or water misting can be considered to minimise odours. • A complaints register must be kept onsite. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how concern was addressed. 						
Nuisance and an unsightly appearance to people in the vicinity of the recycling facility due to windblown litter/waste.	3	3	M	To prevent the occurrence of windblown waste/litter and nuisance conditions.	<ul style="list-style-type: none"> • Waste being transported should be secured or covered on the transport vehicles for the duration of the journey to ensure that waste/litter cannot become airborne. • Waste transport vehicles should not be filled beyond their capacities. • Make provision for adequate storage of waste prior to it being processed. • Waste offloading and storage areas must be swept at the end of each day to ensure that no waste can be blown offsite. • Waste transportation vehicles should be cleaned regularly. • A fence should be constructed around the perimeter of the property to trap any windblown litter. 	During the operational phase.	Site Manager	1	2	L	• NEMA, 1998

7.3.5.7 Infrastructure

Table 29: Environmental impact assessment: Infrastructure

Activity:													
<ul style="list-style-type: none"> • Increased traffic frequency on road infrastructure during the construction and operational phases. 													
Aspect:													
<ul style="list-style-type: none"> • Wear of access roads and insufficient vehicle inspections. 													
Nature and significance of environmental impact													
Project Phase Applicability	Planning and Design Phase			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (before mitigation)			Applicable legislation / other documents		
	Construction		X					Probability	Magnitude	Severity			
	Operation		X										
	Decommissioning												
Impact Description			4	3	M	To minimise the impact of an increase in traffic on access roads to the facility, during the construction phase,	<ul style="list-style-type: none"> • Ensure that all vehicles using access roads are roadworthy. • All loads are to be securely fastened when being transported. • All vehicles are to adhere to the tonnage limitation and acquire a permit as required. • All speed limits and other traffic regulations on the public roadways must be 	During the construction and operational phases.	<ul style="list-style-type: none"> • Facility Manager • ECO 	2	2	L	• NEMA, 1998

				as well as a minimisation of the impacts during the operational phase (increased traffic to the facility).	adhered to.							
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7.3.5.8 Resource usage

Table 30: Environmental impact assessment: Resource usage

Activity:													
<ul style="list-style-type: none"> Usage of resources, such as electricity and water (municipal water supply). 													
Aspect:													
<ul style="list-style-type: none"> Inefficient and redundant use of valuable resources (electricity and water from the municipal water supply). Leaking or broken water storage vessels. Leaking or broken water pipelines. 													
Nature and significance of environmental impact													
Project Phase Applicability	Planning and Design Phase												
	Construction		X										
	Operation		X										
	Decommissioning												
Impact Description			Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
Probability	Magnitude	Severity	Probability	Magnitude	Severity								
Wastage or depletion of a valuable resources (water and electricity) due to inefficient or redundant usage. Water and electricity will be obtained from the municipality.			3	2	M	To prevent the wastage or depletion of a valuable resources (water and electricity).	General <ul style="list-style-type: none"> Ensure that all employees have been informed on the importance of natural resources (proper environmental training and awareness). Supervisors to inspect the operations regularly to determine areas of improvement with regards to resource consumption. Regular maintenance and inspection of equipment such as hose pipes, to prevent leaks. Monitoring of resource consumption. Identify areas where resource consumption can be minimised. Set targets to try minimise resource consumption. Identify technologies and practices that may reduce resource consumption. Implementation of technologies and practices that can reduce resource consumption. Water <ul style="list-style-type: none"> Regular inspection and maintenance of all boreholes, water tanks or reservoirs, toilets, water pipes and taps. Leaking tanks or reservoirs, taps, toilets and pipes are to be repaired immediately. Running water taps and pipes may not be left unattended. All pipe, hose and tap connections are to be fitted with correct and appropriate plumbing fittings. 	During the construction and operational phases.	<ul style="list-style-type: none"> Facility Manager ECO 	1	2	L	<ul style="list-style-type: none"> NEMA, 1998 NWA, 1998

				<ul style="list-style-type: none"> All measuring devices must be properly maintained, must be in good working order and must be easily accessible. This shall include a programme of checking, calibration, and/or renewal of measuring devices. <p>Electricity</p> <ul style="list-style-type: none"> Save electricity by turning off lights and computers when leaving the office. Halogen light bulbs convert approximately 80% of the energy used into heat rather than light. Rather use energy saving CFLs (compact fluorescent lights) or newer and more efficient LEDs (light-emitting diodes). 							
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7.3.5.9 Visual

Table 31: Environmental impact assessment: Visual

Activity:													
<ul style="list-style-type: none"> Operation of the recycling facility. 													
Aspect:													
<ul style="list-style-type: none"> Existence of the site in view of receptors in the vicinity of the site, such as adjacent neighbours and motorist travelling on Maunde Street. 													
Nature and significance of environmental impact													
Project Phase Applicability	Planning and Design Phase												
	Construction		X										
	Operation		X										
	Decommissioning												
Impact Description			Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
Probability	Magnitude	Severity	Probability	Magnitude	Severity								
Negative impact on neighbours and motorist having to see the recycling facility from their residences and Maunde Street, respectively.			5	3	H	To minimise the visual impact of the recycling site on receptors in the vicinity of the site.	<ul style="list-style-type: none"> Operational measures must be put in place to keep weed, pest and vermin presence as low as possible. Operational measures must be put in place to ensure that vehicles leaving the site do not track loose mud, waste and/or litter outside the facility. Operational procedures must be put in place to minimise the generation and proliferation of windblown litter. A screen of fast growing trees should be planted along the boundaries of the site to screen the site from the adjacent receptors to the North and West. Sweep waste recycling areas on a daily basis. Ensure that minimal waste is present outside of waste storage and handling/processing areas (non-operational areas). Lighting onsite must be directed towards the interior of the site and not outwards towards residential areas and Maunde Street. Lighting should be adequate to ensure security, but should not disturb receptors beyond the site boundary. 	During the construction and operational phases.	Site Manager	3	2	M	<ul style="list-style-type: none"> NEMA, 1998

7.3.5.10 Heritage and Palaeontological

The assessment of the study area revealed no sites, features or artefacts of cultural heritage (archaeological or historical) origin or significance. The area has been extensively disturbed in the recent past through formal and informal dumping of building rubble and other refuse, and large sections have been bulldozed and flattened, with clearance of vegetation also having been undertaken. If any sites did exist on the project property in the past, they would have been disturbed or destroyed to a large degree. Furthermore, should any sites exist in the larger area, and specifically on the ridges to the south of the study area footprint, there would be no impact by the proposed development on these sites.

From a cultural heritage point of view, the development should therefore be allowed to continue. From an archaeological point of view, the site has a high to very high palaeontological sensitivity in terms of the likelihood of fossils being present onsite, should deep excavations be undertaken and bedrock be exposed.

Table 32: Environmental impact assessment: Heritage and Palaeontological

Activity:													
<ul style="list-style-type: none"> Site clearance. General construction and excavation activities. Operational activities at the recycling facility. 													
Aspect:													
<ul style="list-style-type: none"> Disturbance of artefacts or sites of cultural heritage (archaeological and historical) significance. 													
Nature and significance of environmental impact													
Project Phase Applicability	Planning and Design Phase												
	Construction		X										
	Operation		X										
	Decommissioning												
Impact Description			Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
Probability	Magnitude	Severity	Probability	Magnitude	Severity								
Loss of heritage artefacts or sites protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999).			2	3	M	To protect artefacts or sites of cultural heritage (historical) significance.	<ul style="list-style-type: none"> The subterranean presence of archaeological or historical sites, features or objects is always a possibility. Should any be uncovered during the development process, all activities must cease and an archaeologist should be called in to investigate and recommend the best way forward. The presence of other low stone packed or unmarked graves should also be kept in mind. No sites, features or objects may be disturbed (e.g. picked up) by employees. 	During the construction and operational phases.	<ul style="list-style-type: none"> Facility Manager ECO 	2	2	L	<ul style="list-style-type: none"> NEMA, 1998 NHRA, 1999
Loss of fossils protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999).			4	3	H	To protect artefacts or sites of archaeological significance.	<ul style="list-style-type: none"> The EAP as well as the ECO for this project must be made aware of the fact that the Pretoria Group sediments are Highly significant for fossil remains of stromatolites and rocks of the Chuniespoort Group are allocated a Very Highly significance for fossils, albeit mostly where good outcrops are available for inspection. In areas that are allocated a Very High and High Palaeontological sensitivity and specifically where deep excavation into bedrock is envisaged (following the geotechnical investigation), or where fossils are recorded during the geotechnical investigations, a qualified palaeontologist must be appointed to assess/inspect the excavated material and record fossils at specific footprints (collect a representative sample of the fossil rich rocks according to SAHRA specifications) of infrastructure developments (Phase 1 PIA). These recommendations should form part of the EMP of the project. 	During the construction and operational phases.	<ul style="list-style-type: none"> Facility Manager ECO 	4	2	M	<ul style="list-style-type: none"> NEMA, 1998 NHRA, 1999



Refer to Part 8 below for a summary on the key findings related to the proposed project.

1.1.1 Cumulative Impacts

Cumulative impacts refer to the situation where an activity may in itself not have a significant impact, but may become significant when added to the existing and potential impacts from similar or different activities in the area.

The following potential cumulative impacts have been identified:

Table 33: Cumulative impacts

Impact: Environmental Noise	
Contributing aspects	Noise generated at the recycling facility will add to the existing noise levels in the area, such as from passing vehicles on the adjacent Maunde Street.
Impact: Odour and nuisance	
Contributing aspects	Odours generated at the recycling facility will add to any residual odours generated at the Kwaggasrand landfill site, which is adjacent to the recycling facility. This could subsequently cause nuisance to receptors in the vicinity of the recycling facility and landfill site.



8. ENVIRONMENTAL IMPACT STATEMENT

8.1 Summary of key findings

The Application process for a Waste Management Licence in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), has been initiated to authorise the upgrading of the Kwaggasrand Recycling Facility.

Licensing will ensure that the facility can operate for the long term without facing liabilities in terms of non-compliance to environmental legislation and will allow the facility to be upgraded to a multi-purpose waste recycling facility, where a number of new waste streams can be accommodated and processed, thereby diverting recyclable waste streams from landfill.

All alternatives will have an impact on the environment. The main negative impacts from the recycling facility and its proposed upgrades are summarised as follows:

- Environmental impacts due to poor design and planning of the recycling facility upgrades;
- Formation of subsidence features in dolomite residuum areas;
- Soil, surface water and ground water pollution due to incorrect management and disposal of cement and concrete;
- Soil, surface water and ground water pollution due to ineffectively treated wastewater entering the environment;
- Soil, surface water and ground water pollution due to the run-off of contaminated wash water;
- Soil pollution and degradation due to incorrect management, storage and disposal of construction waste, general waste and hazardous waste;
- Soil, surface water and ground water pollution due to unsanitary conditions onsite;
- Soil, surface water and ground water pollution due to inadequate storage of tyres and rubber crumbs;
- Soil, surface water and ground water pollution due to the incorrect management, storage and disposal of chemicals and oil;
- Compromisation of the municipal sewage system's efficacy;
- Soil, surface water and ground water pollution due to affected stormwater runoff;
- Destruction and deterioration of natural, sensitive vegetation to the South of the site boundary;
- The spread of alien and invasive plant species from the site into the natural vegetation area to the south of the site boundary;
- Disturbance and displacement of fauna species onsite;
- Degradation and loss of topsoil;
- Soil erosion;
- Generation of noise pollution and nuisance;
- Degradation of ambient air quality due to dust generation;



- Increased traffic flow to the site and potential strain on existing road infrastructures as well as creating a higher risk of vehicular accidents on the access roads;
- The generation of odours and nuisance from the waste handled onsite;
- Nuisance and an unsightly appearance to people in the vicinity of the recycling facility due to windblown litter/waste;
- Release of atmospheric emissions due to fire establishment from to the storage of large quantities of waste materials, both before and after processing at the recycling facility, as well as the storage of waste tyres and rubber crumbs;
- Wear of access roads, accidents on access roads, unpermitted transport of materials and loss of materials being transported on access roads;
- Groundwater contamination from waste leachate from the composting facility; and
- Potential loss of artefacts or sites protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999).

8.2 Comparative assessment of positive and negative implications of the proposed activity and alternatives

Part 6 of this draft EIR contains a detailed investigation and assessment of the alternative options for the proposed project. The positive and negative implications of each alternative are also described in the table below.

From the table below, one can see that the development options have more positive impacts than the No-Go option.



Table 34: Comparison of the alternatives (identified in section 6 of this report) and the no-go option

Alternative	Positive impacts	Negative impacts
No-Go Option	<ul style="list-style-type: none"> No further disturbance of “disturbed and secondary” and “transformed” grassland onsite. No additional short-term impacts on the environment due to construction activities. 	
Off-site bio-digesting of wet waste or onsite drying to produce RDF	<ul style="list-style-type: none"> Creation of job opportunities during the construction and operational phases of the project. Efficient utilisation of currently underutilised land within the urban area of the City of Tshwane. Diversion of waste from landfill. 	
Wet waste baling and plastic wrapping	<ul style="list-style-type: none"> Increase in the lifespan of remaining landfill sites in the City of Tshwane. 	<ul style="list-style-type: none"> Underutilisation of a disturbed site within an urban area of the City of Tshwane.
Waste Tyre Crumbing	<ul style="list-style-type: none"> Bio-digestion of the wet waste will convert the waste into a product (methane) that can be used as a fuel source for electricity generation. 	<ul style="list-style-type: none"> No diversion of recyclable waste from landfill.
Green Waste Composting	<ul style="list-style-type: none"> Drying the wet waste to produce Refuse Derived Fuel (RDF) will allow the waste to be re-used as a feedstock in combustion installations. 	<ul style="list-style-type: none"> No increase in the lifespan of remaining landfill sites within the City of Tshwane.
Building Rubble Crushing	<ul style="list-style-type: none"> Converting the waste tyres into rubber crumbs will allow them to be re-used elsewhere, such as in rubber products, road tarmac and reclaimed rubber processes. Recycling of a waste material (green waste) through composting will turn it into nutrient a rich, beneficial product (compost), which is a fertiliser, soil conditioner, acts as a 	<ul style="list-style-type: none"> High transportation costs to transport recyclable waste to the remaining, open landfill sites within the City of Tshwane.



Alternative	Positive impacts	Negative impacts
	<p>natural pesticide and adds humus to the soil.</p> <ul style="list-style-type: none"> • The crushed building rubble can be re-used as filling and foundation material in construction products. • The proposed processes are in line with the waste management hierarchy in terms reducing, re-using and recycling waste. • The sale of these products will generate revenue for the applicant. • Lower transportation costs for taking the waste to the recycling facility as opposed to taking it to the remaining landfill site within the City of Tshwane. 	



9. CONCLUSION

Information has been provided to the Gauteng Department of Agriculture and Rural Development and Interested and Affected Parties during the Scoping- and EIA Phases. Comments and concerns were received and integrated into this Environmental Impact Assessment Report. This document serves as the draft report to be considered by the registered I&APs and state departments. Should there be any comments received on this report within the notice period provided, these comments will be address in the final report that will be submitted to the competent authority, the Gauteng Department of Agriculture and Rural Development, for final perusal and decision making.

This Waste Management License Application and its associated EIA process has been carried out in accordance with the NEM: WA, 2008, the NEMA, 1998, and the Regulations there under.

The identified impacts/environmental risks to the environment as a result of the proposed recycling facility upgrade project are mostly **Medium**. The impacts can, however, be mitigated to mostly **Low**, provided that the draft Environmental Management Programme, containing all proposed mitigation measures, is implemented. It is further important that the EMP must be viewed as a dynamic, working document that will be improved upon as and when required.

The positive and negative impacts of all the alternatives have been identified and assessed in Chapter 6. The development option (the upgrading project) is preferred to the No-Go option (the operation of the existing recycling facility and no further development), as derived from comparative analysis. While the development option has negative impacts in terms of air and noise pollution, water quantity and the generation of traffic, it also has benefits in terms of visual aesthetics (as the mostly vacant site will be developed), property values, safety and security, infrastructure development and the local and regional economy. The positive social impacts outweigh the negative environmental impacts to give an overall positive score of “1”, whereas the No-Go Option results in a negative score of “-4”.

The following main potential environmental impacts have been identified as part of this Environmental Impact Assessment process:

- Environmental impacts due to poor design and planning of the recycling facility upgrades;
- Formation of subsidence features in dolomite residuum areas;
- Soil, surface water and ground water pollution due to incorrect management and disposal of cement and concrete;
- Soil, surface water and ground water pollution due to ineffectively treated wastewater entering the environment;
- Soil, surface water and ground water pollution due to the run-off of contaminated wash water;
- Soil pollution and degradation due to incorrect management, storage and disposal of construction waste, general waste and hazardous waste;



- Soil, surface water and ground water pollution due to unsanitary conditions onsite;
- Soil, surface water and ground water pollution due to inadequate storage of tyres and rubber crumbs;
- Soil, surface water and ground water pollution due to the incorrect management, storage and disposal of chemicals and oil;
- Compromisation of the municipal sewage system's efficacy;
- Soil, surface water and ground water pollution due to affected stormwater runoff;
- Destruction and deterioration of natural, sensitive vegetation to the South of the site boundary;
- The spread of alien and invasive plant species from the site into the natural vegetation area to the south of the site boundary;
- Disturbance and displacement of fauna species onsite;
- Degradation and loss of topsoil;
- Soil erosion;
- Generation of noise pollution and nuisance;
- Degradation of ambient air quality due to dust generation;
- Increased traffic flow to the site and potential strain on existing road infrastructures as well as creating a higher risk of vehicular accidents on the access roads;
- The generation of odours and nuisance from the waste handled onsite;
- Nuisance and an unsightly appearance to people in the vicinity of the recycling facility due to windblown litter/waste;
- Release of atmospheric emissions due to fire establishment from to the storage of large quantities of waste materials, both before and after processing at the recycling facility, as well as the storage of waste tyres and rubber crumbs;
- Wear of access roads, accidents on access roads, unpermitted transport of materials and loss of materials being transported on access roads;
- Groundwater contamination from waste leachate from the composting facility; and
- Potential loss of artefacts or sites protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999).

Appropriate mitigation measures will assist in minimising the potential impacts on the surrounding environment during the construction and operational phases of the proposed project.

Based on the outcomes of the Environmental Impact Assessment, conducted as part of this full Scoping and Environmental Impact Assessment process, as well as the alternatives assessment, the following recommendations are made:

1. **The proposed project (the upgrading of the Kwaggasrand Recycling Facility) should be authorised and allowed to proceed on the preferred site (25°46'30.757"S; 28°5' 42.494"E);**
2. The mitigation measures proposed in this report and the draft Environmental Management Programme must be implemented during all phases of the proposed project;



3. It is assumed that the mitigation measures proposed in this report and the draft Environmental Management Programme will be correctly implemented by the applicant and that they will be effective;
4. A communications pathway must be established that would allow the designated ECO to accept and deal with stakeholder complaints;
5. Proposed mitigation measures should be incorporated as far as possible into the operational plan for the recycling facility; and
6. Strict monitoring and enforcement of the requirements of the EMP must be undertaken to ensure that contractors and operators adhere to these requirements.

