

Impacts on these sites by the development will be evaluated as follows:

Assessment of predicted significance of impacts for a proposed development is by its nature, inherently uncertain – environmental assessment is thus an imprecise science. To deal with such uncertainty in a comparable manner, standardized and internationally recognized methodology has been developed, and is applied in this study to assess the significance of the potential environmental impacts of the proposed exploration activities.

The significance of the impacts was determined through the following:

For each impact, the SEVERITY (size or degree scale), DURATION (time scale) and EXTENT (spatial scale) are described (**Table 2**). These criteria are used to determine the CONSEQUENCE of the impact (**Table 3**), which is a function of severity, spatial extent and duration.

Table 2: Ranking criteria for environmental impacts

SEVERITY/INTENSITY	H	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Irreplaceable loss of resources.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Noticeable loss of resources.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Limited loss of resources.
DURATION	L	Quickly reversible. Less than the project life. Short term (0-5 years)
	M	Reversible over time. Life of the project. Medium term (6-15 years)
	H	Permanent. Beyond closure. Long term (>15 years)
SPATIAL SCALE	L	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national

Table 3: Determining the consequence

SEVERITY	DURATION		SPATIAL SCALE		
			Site Specific (L)	Local (M)	Regional/ National (H)
Low	Long term	H	Medium	Medium	Medium
	Medium term	M	Low	Low	Medium
	Short term	L	Low	Low	Medium
Medium	Long term	H	Medium	High	High
	Medium term	M	Medium	Medium	High
	Short term	L	Low	Medium	Medium
High	Long term	H	High	High	High
	Medium term	M	Medium	Medium	High
	Short term	L	Medium	Medium	High

The SIGNIFICANCE of an impact is then determined by multiplying the consequence of the impact by the probability of the impact occurring, as shown in **Table 4**, with interpretation of the impact significance outlined in **Table 5**.

Table 4: Determining the Significance Rating

PROBABILITY (of exposure to impacts)		CONSEQUENCE		
		L	M	H
Definite/ Continuous	H	Medium	Medium	High
Possible/ frequent	M	Medium	Medium	High
Unlikely/ seldom	L	Low	Low	Medium

Table 5: The interpretation of the impact significance

SIGNIFICANCE	CRITERIA
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

Table 6: The interpretation of the status of the impact

IMPACT STATUS	CRITERIA
Positive	The impact benefits the environment
Negative	The impact results in a cost to the environment
Neutral	The impact has no effect on the environment

Once the significance of an impact has been determined, the CONFIDENCE in the assessment of the significance rating is ascertained using the rating systems outlined in **Table 7**.

Table 7: Definition of confidence ratings

CONFIDENCE RATINGS*	CRITERIA
High	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact. Greater than 70% sure of impact prediction
Medium	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact. Between 35% and 70% sure of impact prediction.
Low	Limited useful information on and understanding of the environmental factors potentially influencing this impact. Less than 35% sure of impact prediction.

* The level of confidence in the prediction is based on specialist knowledge of that particular field and the reliability of data used to make the prediction.

The degree to which the impact can be reversed is estimated using the rating system shown in **Table 8**.

Table 8: Definition of Reversibility Ratings

REVERSIBILITY RATINGS	CRITERIA
Irreversible	Where the impact is permanent.
Partially Reversible	Where the impact can be partially reversed.
Fully Reversible	Where the impact can be completely reversed.

The degree to which there will be a loss of resources, as shown in **Table 9** refers to the degree to which a resource is permanently affected by the activity, i.e. the degree to which a resource is irreplaceable.

Table 9: Definition of loss of resources

LOSS OF RESOURCES	CRITERIA
Low	Where the activity results in a loss of a particular resource but where the natural, cultural and social functions and processes are not affected.
Medium	Where the loss of a resource occurs, but natural, cultural and social functions and processes continue, albeit in a modified way.
High	Where the activity results in an irreplaceable loss of a resource.

Lastly, the degree to which the impact can be mitigated or enhanced is shown in **Table 10**.

Table 10: Degree to which impact can be mitigated

DEGREE TO WHICH IMPACT CAN BE MITIGATED	CRITERIA
None	No change in impact after mitigation.

Very Low	Where the significance rating stays the same, but where mitigation will reduce the intensity of the impact.
Low	Where the significance rating drops by one level, after mitigation.
Medium	Where the significance rating drops by two to three levels, after mitigation.
High	Where the significance rating drops by more than three levels, after mitigation.

4 CURRENT STATUS QUO

4.1 Description of Study Area

The study area is characterised by dense wetlands, small deep cut streams and generally degraded land utilised for dumping and in large sections of the upper tributaries – illegal small scale mining (Figure 4).





Figure 4 - Current status

5 ARCHIVAL AND DESKTOP RESEARCH FINDINGS

The aim of the archival and desktop background research is to identify possible heritage resources that could be encountered during the field work. The archival and desktop research focused on available information sources, which were used to compile a background history of the study area and surrounds, as summarised in Error! Reference source not found.. This data then informed the possible heritage resources to be expected during field surveying.

5.1 Historic Overview of Study Area and Surrounding Landscape

DATE	DESCRIPTION
2.5 million to 250 000 years ago	The Earlier Stone Age is the first phase identified in South Africa's archaeological history and comprises two technological phases. The earliest of these is known as Oldowan and is associated with crude flakes and hammer stones. It dates to approximately 2 million years ago. The second technological phase is the Acheulian and comprises more refined and better made stone artefacts such as the cleaver and bifacial hand axe. The Acheulian dates back to approximately 1.5 million years ago.

DATE	DESCRIPTION
	Earlier Stone Age finds have been noted during developments in the Braam Fischerville area 2 kilometres west of Area E (Birkholtz, 2001).
250 000 to 40 000 years ago	The Middle Stone Age (MSA) is the second oldest phase identified in South Africa's archaeological history. This phase is associated with flakes, points and blades manufactured by means of the so-called 'prepared core' technique.
40 000 years ago to the historic past	<p>The Later Stone Age is the third archaeological phase identified and is associated with an abundance of very small artefacts known as microliths.</p> <p>No Later Stone Age sites are known to be in the vicinity of the study area. However, this is in all likelihood rather due to a lack of research focus on the surroundings of the study area than a lack of sites.</p>
AD 1450 – AD 1650	<p>The Uitkomst facies of the Blackburn Branch of the Urewe Ceramic Tradition represents the first Iron Age period to be identified for the surroundings of the study area. This facies can likely be dated to between AD 1650 and AD 1820. The decoration on the ceramics associated with this facies is characterised by stamped arcades, appliqué of parallel incisions, stamping as well as cord impressions and is described as a mixture of the characteristics of both Ntsuanatsatsi (Nguni) and Olifantspoort (Sotho).</p> <p>The Uitkomst facies (with the Makgwareng facies) is seen as the successors to the Ntsuanatsatsi facies. The Ntsuanatsatsi facies is closely related to the oral histories of the Early Fokeng and represent the earliest known movement of Nguni people out of Kwazulu-Natal into the inland areas of South Africa. In terms of this theory, the Bafokeng settled at Ntsuanatsatsi Hill in the present-day Free State Province. Subsequently, the BaKwena lineage broke away from the Bahurutshe cluster and crossed southward over the Vaal River to come in contact with the Bafokeng. As a result of this contact a Bafokeng-Bakwena cluster was formed, which moved northward and became further 'Sotho-ised' by coming into increasing contact with other Sotho-Tswana groups. This eventually resulted in the appearance of Uitkomst facies type pottery which contained elements of both Nguni and Sotho-Tswana speakers (Huffman, 2007).</p> <p>No sites associated with the Uitkomst facies are known from the surroundings of the study area.</p>
AD 1700 – AD 1840	<p>The Buispoort facies of the Moloko branch of the Urewe Ceramic Tradition is the next phase to be identified within the study area's surroundings. It is most likely dated to between AD 1700 and AD 1840. The key features on the decorated ceramics include rim notching, broadly incised chevrons and white bands, all with red ochre (Huffman, 2007). It is believed that the Madikwe facies developed into the Buispoort facies. The Buispoort facies is associated with sites such as Boschhoek, Buffelshoek, Kaditshwene, Molokwane and Olifantspoort (Huffman, 2007).</p> <p>No sites associated with the Buispoort facies are known from the surroundings of the study area.</p>
AD 1821 – AD 1823	After leaving present-day KwaZulu-Natal the Khumalo Ndebele (more commonly known as the Matabele) of Mzilikazi migrated through the general vicinity of the

DATE	DESCRIPTION
1832	At the time, a Zulu impi of King Dingane moved through the general vicinity of the study area on their way to attack the Matabele of Mzilikazi who were settled along the Magaliesberg Mountains (Bergh, 1999).
1836	The first Voortrekker parties started crossing over the Vaal River at the time. The earliest Voortrekker party to cross over the Vaal River was the one under the leadership of Louis Trichardt and Johannes Jacobus Janse van Rensburg. Although the exact route followed by the Trichardt-Janse van Rensburg party was not recorded, one suggestion is that they passed through the strip of land in-between the Bronkhorst Spruit in the west and the Wilge River to the east (Bergh, 1999). These two rivers are located to the east of Delmas, and as a result some distance east of the present study area.
1860-1880	The farm Vogelstruisfontein initially fell under the Potchefstroom district of the then Transvaal Republiek (up to 1866). After 1866, the district of Heidelberg was established and Vogelstruisfontein then came under the jurisdiction of that District (Payne, 1948). According to Payne, the eastern portion of Vogelstruisfontein had been purchased by JG Steyn on 29 August 1864. The western portion of Vogelstruisfontein was owned by JN van der Berg, who also received his Deed of Transfer in August 1864. It seems that both JG Bantjes and Fred Struben were undertaking prospecting activities on the farm Vogelstruisfontein (Bantjes on the eastern portion and Struben on the western portion) at around the same time and both found the continuation of the Main Reef on the respective portions of the farm around June 1886 (Payne, 1948).
1886	In April of 1886 President Kruger received three petitions signed by 121 persons requesting that the farms Vogelstruisfontein, Roodepoort, Langlaagte and the two portions comprising Paardekraal be declared public diggings. The amended gold laws of 4 August 1886 meant that the government was now rightly allowed to proclaim privately owned land as public diggings with or without the owner's approval. Subsequently, on 18 August 1886, a notice in the "De Staatscourant" informed all interested parties that the government had located yielding gold reefs on the Witwatersrand in the district of Heidelberg and that Roodepoort was one of these farms (Figure 1). The notice stated that these areas were to be declared as public diggings and that all interested and affected parties would be given one month in which to secure their interest in the land. The farm Vogelstruisfontein was to be declared a public prospecting area on 11 October 1886 (Rosenthal, 1970).
1891	<p>At least two gold mining companies were producing on the farm Vogelstruisfontein by the end of 1888: Bantjes and Vogelstruis Gold Mining Company. By 1891, three were in existence, of which the original capitals, the number of claims owned in 1891 and the dates the companies were registered is available. This included:</p> <ul style="list-style-type: none"> • On the Western Portion of Vogelstruisfontein (vd Berg's old farm), the Vogelstruis G.M. Co. (registered 1888 in London), with a capital of £300,000; owned 1 mynpacht of 249 morgen, Freehold title 1524 morgen and the homestead and township of Hamberg.

DATE	DESCRIPTION
	<ul style="list-style-type: none"> On the Eastern Portion of Vogelstruisfontein (Steyn's old farm), two companies were registered: <ul style="list-style-type: none"> Bantjes Reef (registered Sept 1887) with a capital of £95,000; owned 3 mynpachts; and Odessa (registered Jan 1889) with a capital of £95, 000; owned 54 claims south of Bantjes Reef
1902	At the end of hostilities in 1902, the new Witwatersrand District was created from farms which were previously located in the districts of Krugersdorp, Heidelberg and Pretoria. The study area now fell within the district of Witwatersrand (Bergh 1999).
1904	After the outbreak of bubonic plague inhabitants of the Brickfields settlement was relocated to the Klipspruit 'health camp', close to the current day Klipspruit Sewage works (Brodie, 2008).
1931	The first 300 houses were constructed in Orlando (Brodie, 2008).
1934	A section of Klipspruit was renamed Pimville in honour of Councillor James Howard Pim (Brodie, 2008).
1947	<p>The waiting list for houses increased from 143 in 1939 to 16000 by 1945. This lead to th need for the construction of housing. The first houses of the Dube township, proposed in 1946, were constructed and residents moved in by the end of that year 1948 (Brodie, 2008).</p> <p>Large numbers of squatters invaded half constructed home and the town council issue additional land for settlement. These areas are now known as Jabavu, Maroko and sections of Pimville and Orando.</p>
1954-1965	45 000 houses were constructed to relieve the hosing crisis in Soweto (Brodie, 2008).

5.2 Previous Heritage Impact Assessment Reports

Studies in the general vicinity of the study area are:

- BIRKHOLTZ, P.D. 2001. *Heritage Impact Assessment Bram Fischerville Ext 7 - Rand Leases Property Development. CRM Africa.***

CRM Africa, identified a single stone age site during the study. A further assessment was done on the findings of the HIA and found the site to be of low significance.
- BIRKHOLTZ, P.D. 2014.. *Heritage Impact Assessment for the proposed establishment of Goudrand Ext. 12, Goudrand Ext. 13, Goudrand Ext. 14 and Goudrand Ext. 15 situated within the***

Roodepoort Magisterial District, City of Johannesburg Metropolitan Municipality, Gauteng Province.

Birkholtz, identifies numerous structures that could be of heritage significance. Mostly related to previous mining activities.

6 FIELDWORK FINDINGS

On 30 and 31 May 2016 PGS an archaeologists conducted a site visit and assessment of the study area for possible heritage resources. The study area was visited by vehicle and foot and general site photos were taken of areas visited.

It was found that most of the impact areas were located within the wetland and drainage areas of the WMU. The upper section of the study area located in the old Durban Roodepoort deep and Rand Leases mining areas was heavily degraded and disturbed. The lower section of the study area was overgrown with reeds or consisted of deep gullies and streams.

No heritage resources were identified.

7 IMPACT OF PROPOSED DEVELOPMENT ON HERITAGE RESOURCES

In this section the impact of the proposed development on the study area will be calculated.

7.1 Introduction

No heritage resources were identified during the survey.

In the section that follows, impact risk assessments will be undertaken on those sites that will be impacted upon by the proposed development.

7.2 Risk Calculation for the Impact of the Proposed Development on possible heritage resources

Table 11 provides and analysis of the possible impacts on chance finds of heritage resources.

7.2 Mitigation of impacts

Table 12 provides mitigation measures to address the management of heritage resources during the construction activities as proposed for the project.

Table 11: Impact calculation

Activities	Impacts	Aspects affected	Phase	Significance rating	Typical mitigation measures																																				
Soil and ground movement during rehabilitation activities in stream areas.	<p>Disturbance of unidentified heritage resources – chance finds Destruction of undiscovered subsurface heritage resources during construction activities.</p> <p>The severity if the impact on heritage resources found during construction will be medium and will be in most cases be localised. The probability of such chance finds occurring is low.</p> <p>After mitigation the severity of impact will be minimal with the implementation of mitigation measures.</p>	Heritage	Construction	<table border="1"> <thead> <tr> <th></th> <th>Without mitigation</th> <th>With mitigation</th> </tr> </thead> <tbody> <tr> <td>Severity</td> <td>Medium</td> <td>Low</td> </tr> <tr> <td>Duration</td> <td>High - Permanent</td> <td>High - Permanent</td> </tr> <tr> <td>Extent</td> <td>Local - Low</td> <td>Local - Low</td> </tr> <tr> <td>Consequence</td> <td>Medium</td> <td>Low</td> </tr> <tr> <td>Probability</td> <td>Low</td> <td>Low</td> </tr> <tr> <td>Significance</td> <td>Low</td> <td>Low</td> </tr> <tr> <td>Status</td> <td>Negative</td> <td>Negative</td> </tr> <tr> <td>Confidence</td> <td>Low</td> <td>Low</td> </tr> <tr> <td>Reversibility</td> <td>Irreversible</td> <td>Irreversible</td> </tr> <tr> <td>Loss of resource</td> <td>High</td> <td>High</td> </tr> <tr> <td>Degree to which the impact can be mitigated</td> <td>High</td> <td>High</td> </tr> </tbody> </table>		Without mitigation	With mitigation	Severity	Medium	Low	Duration	High - Permanent	High - Permanent	Extent	Local - Low	Local - Low	Consequence	Medium	Low	Probability	Low	Low	Significance	Low	Low	Status	Negative	Negative	Confidence	Low	Low	Reversibility	Irreversible	Irreversible	Loss of resource	High	High	Degree to which the impact can be mitigated	High	High	<p>Archaeologist to check initial site clearance with construction crew for possible heritage resources.</p> <p>Where any significant resources are found the archaeologist must assess and make the appropriate mitigation requirements.</p> <p>Stop construction if any heritage resources – such as graves, human remains or fossils are identified.</p>
	Without mitigation	With mitigation																																							
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Loss of resource	High	High																																							
Degree to which the impact can be mitigated	High	High																																							

8 MITIGATION MEASURES

The risk calculation above has shown that the impact of the proposed development on heritage resources in the study area is a Low impact.

Table 12: Management of impacts

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE STANDARDS	WITH	TIME PERIOD IMPLEMENTATION	FOR
Chance finds of heritage resources	Construction	Most cases less than 5000m ²	Archaeologist to check initial site clearance with construction crew for possible heritage resources. Where any significant resources are found the archaeologist must assess and make the appropriate mitigation requirements.	Complies with Section 35, 36 and 38 of the NHRA		Beginning of construction, archaeologist to attend once a week during construction where new ground is broken.	
	Construction		Stop construction if any heritage resources – such as graves, human remains or fossils are identified;			When new heritage resources are discovered during construction	

9 CONCLUSIONS AND RECOMMENDATIONS

PGS Heritage (Pty) Ltd was appointed by Lebone Engineering on behalf of Johannesburg City Parks and Zoo to undertake a Heritage Impact Assessment that forms part of the Environmental Impact Assessment and Environmental Management Programme for the for the management of water catchments and sources, namely, water conservation and preservation of the ecological reserve and the goal of reduced water pollution in Johannesburg's Water Management Units within the City of Johannesburg Municipality. This report addresses the WMU of the Middel Klipriver in the Soweto area.

The fieldwork conducted did not identify any significant heritage resources in the accessible areas.

Based on the impact assessment criteria the impact by the proposed development on heritage resources is projected as low. To address the impacts on the chance find of heritage resource the following management measures are recommended:

- Archaeologist to check initial site clearance with construction crew for possible heritage resources.
- Stop construction if any heritage resources – such as graves, human remains or fossils are identified; and
- Where any significant resources are found the archaeologist must assess and make the appropriate mitigation requirements.

The overall impact of the development on heritage resources is seen as acceptably low and impacts can be mitigated to acceptable levels.

10 REFERENCES

10.1 Published Sources

BIRKHOLTZ, P.D. 2001. Heritage Impact Assessment Bram Fischerville Ext 7 - Rand Leases Property Development. CRM Africa.

BRODIE, Nechama. 2008. The Joburg Book. Publisher: Pan McMillan South Africa

FOURIE, W. 2008. Archaeological Impact Assessments within South African Legislation. South African Archaeological Bulletin 63 (187): 77–85, 2008.

LEGISLATIVE REQUIREMENTS – TERMINOLOGY AND ASSESSMENT CRITERIA

1. GENERAL PRINCIPLES

In areas where there has not yet been a systematic survey to identify conservation-worthy places, a permit is required to alter or demolish any structure older than 60 years. This will apply until a survey has been completed and identified heritage resources are formally protected.

Archaeological and palaeontological sites, materials, and meteorites are the source of our understanding of the evolution of the earth, life on earth and the history of people. In terms of the heritage legislation, permits are required to damage, destroy, alter, or disturb such sites. People who already possess such material are required to register it. The management of heritage resources is integrated with environmental resources and this means that before development takes place heritage resources are assessed and, if necessary, rescued or mitigated.

In addition to the formal protection of culturally significant graves, all graves which are older than 60 years and are not in a cemetery (such as ancestral graves in rural areas) are protected. The legislation protects the interests of communities who have an interest in the graves: they must be consulted before any disturbance takes place. The graves of victims of conflict and those associated with the liberation struggle should be identified, cared for, protected and memorials erected in their honour.

Anyone who intends to undertake a development must notify the heritage resource authority and if there is reason to believe that heritage resources will be affected, an impact assessment report must be compiled at the applicant's (i.e. mining company or development company) cost. Thus, the applicant will be able to proceed without uncertainty about whether work will have to be stopped if an archaeological or heritage resource is discovered.

According to the National Heritage Act (Act 25 of 1999 section 32) it is stated that:

An object or collection of objects, or a type of object or a list of objects, whether specific or generic, that is part of the national estate and the export of which SAHRA deems it necessary to control, may be declared a heritage object, including –

- objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, meteorites and rare geological specimens;
- visual art objects;
- military objects;

- numismatic objects;
- objects of cultural and historical significance;
- objects to which oral traditions are attached and which are associated with living heritage;
- objects of scientific or technological interest;
- books, records, documents, photographic positives and negatives, graphic material, film or video or sound recordings, excluding those that are public records as defined in section 1 (xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996), or in a provincial law pertaining to records or archives; and
- any other prescribed category.

Under the National Heritage Resources Act (Act No. 25 of 1999), provisions are made that deal with, and offer protection to, all historic and prehistoric cultural remains, including graves and human remains.

2. GRAVES AND CEMETERIES

Graves younger than 60 years fall under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925) as well as the Human Tissues Act (Act 65 of 1983) and National Health Act (Act 61 Of 2003) and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the Office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning or in some cases the MEC for Housing and Welfare. Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. In order to handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

Graves older than 60 years, but younger than 100 years, fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act) as well as the Human Tissues Act (Act 65 of 1983) and National Health Act (Act 61 Of 2003) and are the jurisdiction of the South African Heritage Resource Agency (SAHRA). The procedure for Consultation Regarding Burial Grounds and Graves (Section 36(5) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in the category located inside a formal cemetery

administered by a local authority will also require the same authorisation as set out for graves younger than 60 years over and above SAHRA authorisation.

If the grave is not situated inside a formal cemetery but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws set by the cemetery authority must be adhered to.

Appendix B
CURRICULUM VITAE

WOUTER FOURIE

Professional Heritage Specialist and Professional Archaeologist and Director PGS Heritage

Summary of Experience

Specialised expertise in Archaeological Mitigation and excavations, Cultural Resource Management and Heritage Impact Assessment Management, Archaeology, Anthropology, Applicable survey methods, Fieldwork and project management, Geographic Information Systems, including *inter alia* -

Involvement in various grave relocation projects (some of which relocated up to 1000 graves) and grave "rescue" excavations in the various provinces of South Africa

Involvement with various Heritage Impact Assessments, within South Africa, including -

- Archaeological Walkdowns for various projects
- Phase 2 Heritage Impact Assessments and EMPs for various projects
- Heritage Impact Assessments for various projects
- Iron Age Mitigation Work for various projects, including archaeological excavations and monitoring
- Involvement with various Heritage Impact Assessments, outside South Africa, including -
 - Archaeological Studies in Democratic Republic of Congo
 - Heritage Impact Assessments in Mozambique, Botswana and DRC
 - Grave Relocation project in DRC

Key Qualifications

BA [Hons] (Cum laude) - Archaeology and Geography - 1997

BA - Archaeology, Geography and Anthropology - 1996

Professional Archaeologist - Association of Southern African Professional Archaeologists (ASAPA) - Professional Member

Accredited Professional Heritage Specialist – Association of Professional Heritage Practitioners (APHP)

CRM Accreditation (ASAPA) -

- Principal Investigator - Grave Relocations
- Field Director – Iron Age
- Field Supervisor – Colonial Period and Stone Age
- Accredited with Amafa KZN

Key Work Experience

2003- current - Director – Professional Grave Solutions (Pty) Ltd

2007 – 2008 - Project Manager – Matakoma-ARM, Heritage Contracts Unit, University of the Witwatersrand

2005-2007 - Director – Matakoma Heritage Consultants (Pty) Ltd

2000-2004 - CEO– Matakoma Consultants

1998-2000 - Environmental Coordinator – Randfontein Estates Limited. Randfontein, Gauteng

1997-1998 - Environmental Officer – Department of Minerals and Energy. Johannesburg, Gauteng

Worked on various heritage projects in the SADC region including, Botswana, Mozambique and the Democratic Republic of the Congo

APPENDIX H: EMPr



MYEZO ENVIRONMENTAL MANAGEMENT SERVICES

Environmental Stewardship

LEBONE ENGINEERING - KLIP MIDDLE SOWETO - ENVIRONMENTAL STUDIES CITY PARKS AND ZOO

**DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR THE ENVIRONMENTAL
STUDIES THAT WAS UNDERTAKEN IN KLIP MIDDLE SOWETO, IN JOHANNESBURG, WITHIN THE
CITY OF JOHANNESBURG MUNICIPALITY**

Document Name: Environmental Management Programme Report

Rev 0.1

Date: 09 SEPTEMBER 2016

GDARD Ref No: Gaut: 002/16-17/E0097

Lebone Ref No: JCP&Z-09/2015

Myezo Ref No: LSES, LRES 2015/10/E

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**LEBONE ENGINEERING–KLIP MIDDLE SOWETO-ENVIRONMENTAL STUDIES AND ZOO
ENVIRONMENTAL MANAGEMENT PLAN FOR LEBONE ENGINEERING AND ZOO**

Document Name: LSES-Environmental Management Plan

Rev.1

Date: 09 SEPTEMBER 2016

Myezo Ref No: LSES /2015/10/EMP



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES**

Environmental Stewardship

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LEBONE ENGINEERING–KLIP MIDDLE SOWETO-ENVIRONMENTAL STUDIES AND ZOO
ENVIRONMENTAL MANAGEMENT PLAN FOR LEBONE ENGINEERING AND ZOO

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**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES**

Environmental Stewardship

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List of Acronyms

BAR- Basic Assessment Report
CLO- Community Liaison Officer
CoJ- City of Johannesburg
CV- Curriculum Vitae
EMP- Environmental Management Plan/Programme
EMPr- Environmental Management Plan report
EA- Environmental Authorisation
EA- Environmental Auditor
ECO- Environmental Control Officer
EERP- Environmental Emergency Response Plan
EMS- Environmental Management System
GDARD- Gauteng Department of Agriculture and Rural development
GDS- Growth Development Strategy
HSRA- Health and Safety Risk Assessment
IAP- Interested and Affected Party
JCPZ- Johannesburg City Parks and Zoos
KWMU- Klipriver Water Management Unit
MPRDA- Mineral and Petroleum Resources Development Act (Act No. 28 of 2002).
NEMA- National Environmental Management Act (Act No. 107 of 1998),
NCR- Non Conformance Report
OHS Officer- Occupational Health and Safety Officer
OEMP- Office of Environmental Monitoring and Prediction
OHSA- Occupational Health and Safety Act (Act No. 85 of 1993)
PPE- Personal Protective Equipment
PM- Project Manager
PPE- Personal Protective Equipment
SHE Officer- Safety, Health and Environmental Officer
WMM- Waste Management Measures
WRC- Water Resource Commission

1. Name, Qualifications and Experience Environmental Assessment Practitioner Compiling this Environmental Management Programme

Babalwa Fatyi, is the founder of Myezo Environmental Management Services (Pty) Ltd (Myezo) and is a registered Professional Natural Scientist (400123/01). She is also registered with Institute of Environmental Management and Assessment, Lincoln, UK (0025153). She has consulting experience, from having worked for an engineering consulting company for a period of 3 years. She has also worked for a mining company, where she was responsible for overseeing the company's compliance with its environmental obligations.

She has academic qualifications to back-up her experience, having obtained Master of Science (*cum laude*) and receiving 'SA Association for Advancement of Science Award' for an outstanding MSc Degree in the Faculty of Science. Babalwa has undertaken several environmental management and public consultation project in terms of National Environmental Management Act (Act No. 107 of 1998) (NEMA), as well as application of mining rights in terms of Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA).

She has developed several Environmental Management Programme reports (EMPr) from various developments from roads, outdoor advertising structures, mining developments with all their hydrological and geohydrological facilities, rehabilitation activities for a series of structures including those requiring catchment hydrology consideration. Babalwa competencies are included in her Curriculum Vitae (CV), attached as Annexure 2. A company profile is attached as Annexure 1.

1.1 Aims of the River Environmental Management Plan

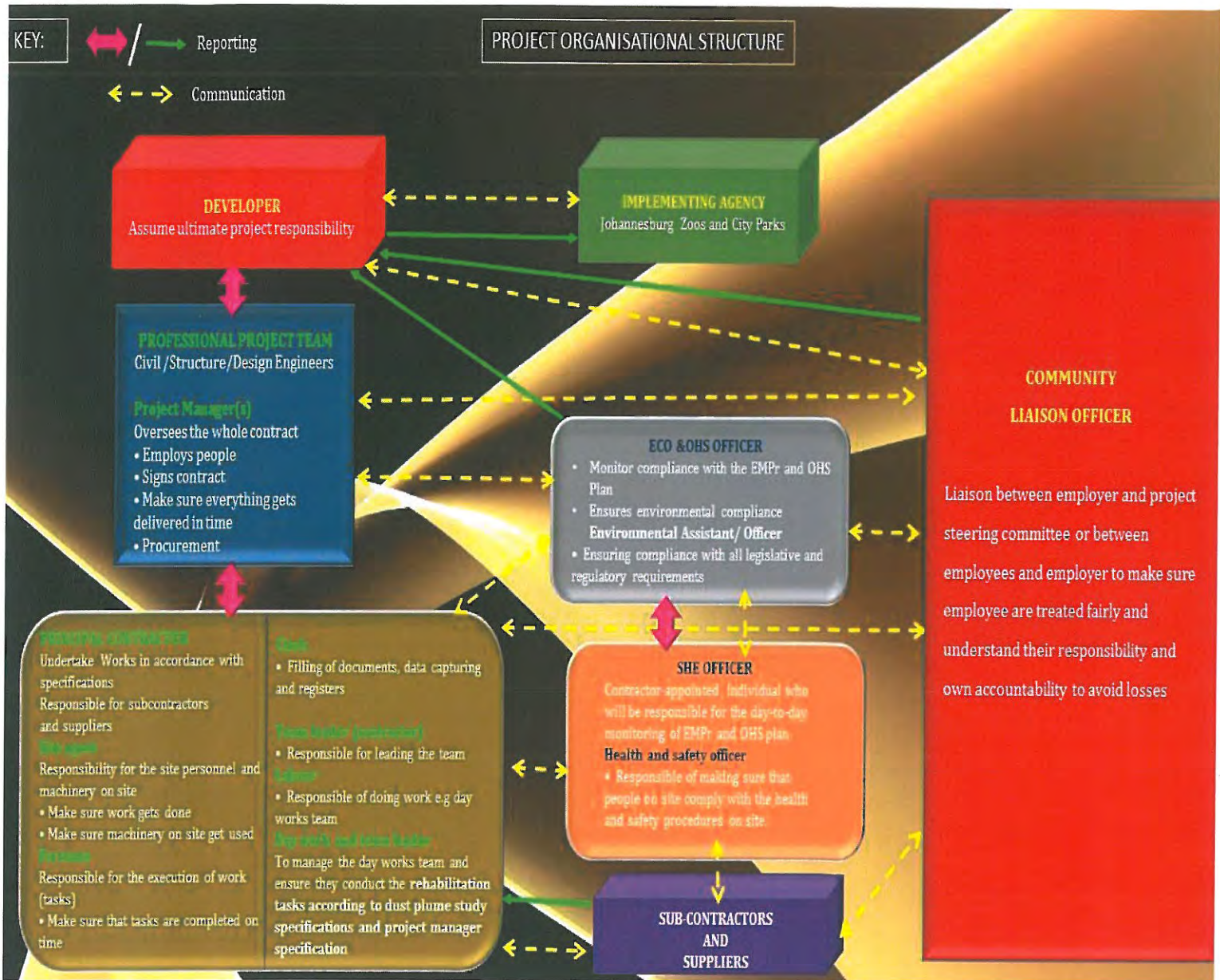
The Environmental Management Plan report (EMPr) (this document) aims to inform managers about the best approaches to dealing with the rehabilitation impacts within Klipriver Water Management Unit (KWMU) and provide guidelines that allow effective prioritisation of management and rehabilitation activities affecting river systems. These have been formulated with a view to meeting specific objectives, as defined in Section 2.1.

1.2 Management and Monitoring Procedures

1.2.1 Organisational Structure and Responsibility

The Chart below provides an indication of the organisational and team structure for the project. Johannesburg City Parks and Zoos (JCPZ) will collaborate with other implementing structures and similar project within the study area. The Project Organisation Structure is shown as Chart 1.2-1 below.

Chart 1.2-1: Project Organisational Structure



2. Mitigation Measures

Planning and Design Phase

2.1 Planning

Responsibility	Developer	Frequency/time frames	Planning and design until closure
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Objectives

- To ensure development and revision of environmental policy and endorsement by the project manager/site manager.
- To provide direction with respect to environmental management during initial phases of project development.

Mitigation Measures

1. Develop an Environmental Policy.
2. Policy to provide a framework for setting and reviewing environmental objectives and targets.
3. Policy to be endorsed by the developer.

2.2 Legal Compliance

2.2.1 Compliance with Environmental Development

The EMPr forms part of the contract documentation and is thus a legally binding document. It is also necessary for the contractor to make provisions as part of their budgets for the implementation of the EMPr. In terms of the National Environmental Management Act (Act No. 107 of 1998), (NEMA) Section 28, an individual responsible for environmental damage must pay costs both to the environment and human health and the preventative measures to reduce or prevent additional pollution and/or environmental damage from occurring. This is referred to as the *Polluter Pays Principle*. Section 28 of the NEMA embodies the polluter pays principle.

The Contractor is deemed not to have complied with the Environmental Specification/EMPr if:

- There is evidence of contravention of clauses within the boundaries of the site, site extensions and haul/access roads;
- Environmental damage ensues due to negligence;
- The contractor ignores or fails to comply with corrective or other instructions issued by the developer, Environmental Control Officer (ECO) or engineer within a specified time; and
- The contractor fails to respond adequately to complaints from the public.

Application of a penalty clause will apply for incidents of non-compliance. The contractor will be allowed one offense and a written warning will be issued by the ECO. Failure to rectify the offense within one (1) working week of the issue of the warning or a repeat offence will result in a fine. This fine will be issued by the ECO. The penalty imposed will be per incident. Unless stated otherwise in the project specification, penalties per incident or violation will be imposed.

2. Mitigation Measures

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Legal Compliance			
Responsibility	Developer	Frequency/time frames	Planning and design until closure
	Implementing Agent		
	Engineer		

Objectives

1. To facilitate compliance with conditions of approval and overall environmental management legal requirements and best practice guidelines

Mitigation Measures

1. Develop a legal register using all the statutes that are outlined under the policy.
2. Legal register to include an assessment of the legal implications of various Acts and relevant sections of those by-laws for local municipality.
3. Reconcile all permit conditions and have a separate register detailing:
 - i. Environmental Authorizations (EAs),
 - ii. Water authorizations,
 - iii. Waste disposal authorizations,
 - iv. Closure certificates,
 - v. Archaeological/Heritage permits.
4. Adhere to permit conditions,
5. Report to regulatory authorities according to set time frames stipulated in various conditions of authorization,
6. Distribute and utilize legal register optimally at all operations,
7. Register with legal update firms to ensure that regular legal updates are received and incorporated into the legal register and implications of such new statutes understood and complied with.
8. Ensure there is adequate staff complement and capacity to ensure law enforcement.

2.3 Environmental Awareness Plan

Responsibility	ECO, EO and H&S Officer	Frequency/time frame	Planning and Design and throughout the operation on a quarterly basis
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Objectives

To ensure that:

- All employees who will perform work that will potentially impact on the environment are identified and trained such that they are competent or aware of the potential impact of their activities.
- The level of expertise and training needs of the identified personnel is determined.
- All employees are aware of the impact of their activities.
- Procedures are established and maintained to make appropriate employees aware of their environmental responsibilities.

2.3.1 Appointment of contractor

- The developer must ensure that this EMPr forms part of any contractual agreements with a Contractor(s) and sub-contractors for the execution of the proposed project. The contractor must make adequate provision in their budgets for the implementation of the EMPr.
- The principal contractor (including sub-contractors and suppliers) must comply with the relevant provisions of the EMPr, applicable environmental legislation, by-laws and associated regulations promulgated in terms of these laws. Tender documents should include statements to include the use of local communities or local community organisation where possible in supplying services and labour to the construction activities.
- Tender documents should include statements to include the use of local communities or local community organisation where possible in supplying services and labour to the construction activities.

2.3.2 Preparation of Method Statements

- Method Statements must be submitted by the contractor to the SHE Officer and must be adhered to by the Contractor and project engineer. These relate to water and storm water management requirements, traffic requirements, solid waste management requirements, fuel storage and filling and dispensing of fuel (diesel and petrol), hydrocarbon spills, contaminated water treatment, the storage of hazardous materials, standard emergency procedures, and biohazard control;
- The ECO will monitor the implementation of the statements. All copies of the statements and plans must be submitted to the appointed ECO;
- A qualified ecologist must mark vegetation such as threatened/protected geophytes which are to be conserved or relocated prior to the Contractor commencing with clearing on site.

2.3.3 Appointment of ECO

- An Independent ECO must be appointed by the holder of the Environmental Authorisation (EA) at their cost to monitor the implementation of the EMPr;
- The nomination of the ECO must be given, in writing, at least fourteen days before the start of any work, clearly setting out reasons for the nomination, and with sufficient detail to enable the developer to make a decision. The developer will, within seven days of receiving the request, approve, reject or call for more information on the nomination;
Once a nominated environmental auditor has been approved he/she will be the ECO and must undertake monthly site inspections and provide monthly audit reports for the duration of the construction and rehabilitation phases. Each audit report must contain the results of the full audit. These audit results report on whether the response to the audit item is favourable, un-favourable or not applicable. Not applicable answers are for those aspects of the construction that have not yet started or are not applicable to the contract being considered. Graphs must be produced for each stage of the EMPr; general requirements, requirements during construction and post construction activities. Each of the aspects within each stage is allocated a percentage score. The percentage score is the percentage of favourable items against the total number of applicable items. The higher the score, the better the compliance

2.3.4 The developer

The developer is ultimately responsible for ensuring compliance with the environmental specification and upholding the team to environmental commitment to compliance with all national, provincial and local legislation that relates to management of this environment.

The developer will through community liaison officer:

- Arrange information meetings for or consults with Interested and Affected Parties (IAPs) about the impending construction activities;
- May on the recommendation of the engineer and/or ECO and Community Liaison Officer (CLO) order the contractor to suspend any or all works on site if the contractor or his sub-contractor/supplier fails to comply with the said specifications; and
- Maintain a register of complaints and queries by members of the public at the site office.

More specifically the City of Johannesburg (CoJ) shall:

- Ensure that it complies with the requirements of this operational EMP for so long as the site is used as a park;
- Designate a staff member as ECO who will on a weekly basis visit the study area site and assess compliance with the office of EMPr;
- Maintain a record of all environmental management activities relating to the site (including all environmental reports, complaints made by the public, etc.)
- Appoint an independent Environmental Auditor (EA) to undertake annual operational phase environmental audits into perpetuity to determine compliance with the Operational EMP.

- Submit an annual operational phase environmental audit report to Gauteng Department of Agriculture and Rural Development (GDARD) and the Local Authority.
- Implement the recommendations made by the EA timeously and to the satisfaction of the EA and/or Local Authority.
- Transfer the legal obligation of ongoing environmental management of the site to any future property owners through an appropriately formulated sale agreement/s.

2.3.5 The engineer

The engineer will:

- Enforce the environmental specification on site;
- Monitor compliance with the requirements of the specification;
- Assess the contractor's environmental performance in consultation with the ECO from which a brief monthly statement of environmental performance is drawn up for record purposes and to be reported to project meetings; and
- Ensure the documentation, in conjunction with the contractor, the state of the site prior to construction activities commencing. This documentation will be in the form of photographs or video record.

2.3.6 The contractor (including sub-contractors)

The contractor is required to:

- Be fully conversant with the EMPr and all conditions of the EA;
- Provide information on previous environmental management experience and company environmental policy in terms of the relevant forms contained in the contract document;
- Supply method statements timeously for all activities requiring special attention as specified and/or requested by the developer, ECO and/or engineer during the duration of the contract;
- Be conversant with the requirements of this environmental specification/EMPr. Brief all his/her staff about the requirements of the environmental specification;
- Comply with requirements of the ECO in terms of this specification and the project specification, as applicable, within the time period specified;
- Ensure any sub-contractors/suppliers who are utilised within the context of the contract comply with the environmental requirements of the project, in terms of the specifications. The contractor will be held responsible for non-compliance on their behalf;
- Bear the cost of any delays, with no extension of time granted, should he or his sub-contractors/suppliers contravene the said specifications such that the engineer orders a suspension of work. The suspension will be enforced until such time as the offending party(ies), procedure, or equipment is corrected;
- Be conversant with the requirements of this environmental specification/ EMPr. Brief all his/her staff about the requirements of the environmental specification;
- Comply with requirements of the ECO in terms of this specification and the project specification, as

applicable, within the time period specified;

- Ensure any sub-contractors/suppliers who are utilized within the context of the contract comply with the environmental requirements of the project, in terms of the specifications. The contractor will be held responsible for non-compliance on their behalf;
- Bear the cost of any delays, with no extension of time granted, should he or his sub-contractors/suppliers contravene the said specifications such that the engineer orders a suspension of work. The suspension will be enforced until such time as the offending party(ies), procedure, or equipment is corrected.

2.3.7 Environmental Control Officer

The ECO shall be a TMN employee or a qualified environmental professional or professional firm with the relevant environmental expertise and shall be responsible for:

- Informing key, on-site staff through initial environmental awareness training of their roles and responsibilities in terms of the EMP;
- Undertaking weekly site inspections to determine compliance with the EMP;
- Identifying areas of non-compliance, and recommending measures to rectify them;
- Compiling a checklist of areas of non-compliance;
- Ensuring follow-up and resolution of all non-compliance;
- Acting as a community liaison officer to receive and respond to complaints raised by the public.

The ECO will:

- Be fully conversant with the EMPr;
- Be familiar with the recommendations and mitigation measures of the associated EMPr for the project;
- Monitor the implementation of the EMPr during the construction and rehabilitation phases;
- Ensure site protection measures are implemented on site;
- Monitor that the principal contractor, sub-contractors, construction teams and the developer are in compliance with the EMPr at all times during the construction and rehabilitation phases of the project;
- Monitor all site activities monthly for compliance;
- Conduct monthly audits of the site according to the EMPr, and report findings to the developer/contractor;
- Attend monthly site meetings;
- Recommend corrective action for any environmental non-compliance at the site;
- Compile a monthly report highlighting any non-compliance issues as well as progress and compliance with the EMPr prescriptions. These monthly reports are to be submitted to the City of Johannesburg (CoJ) and Gauteng Department of Agriculture and Rural Development (GDARD);

and

- Conduct once-off training with the contractor on the EMPr and general environmental awareness.
- It must be noted that the responsibility of the ECO is to monitor compliance and give advice on the implementation of the EMPr and not to enforce compliance. Ensuring compliance is the responsibility of the developer and the Safety, Health and Environment (SHE) Officer.

2.3.8 Occupational Health and Safety Officer

The Occupational Health and Safety (OHS) Officer will be responsible for undertaking of the following:

- Compilation of a comprehensive project Health and Safety Risk Assessment (HSRA);
- Compilation of health and safety specifications based on risks identified;
- Reviewing and approval of health and safety plan(s) submitted by appointed principal contractor(s);
- Conducting monthly health and safety inspections and compiling monthly OHS reports;
- Conducting monthly health and safety audits with audit reports;
- Assisting the developer/contractor in the investigation of major accident/incidents;
- Monitoring of site activities for compliance to the Occupational Health and Safety Act, (Act No. 85 of 1993) (OHSA) and Regulations;
- Establishment and monitoring of project health and safety file;
- Monitoring the principal contractor(s)' health and safety performance; and
- Preparation of project close-out reports and submission of project health and safety files to the Client.

2.3.9 Safety, Health and Environmental (SHE) Officer

The Safety, Health and Environmental Officer will:

- Be fully conversant with the EMPr;
- Be fully conversant with all relevant environmental legislation applicable to the project, and ensure compliance with them;
- Compilation of method statements together with the principal contractor that will specify how potential environmental impacts in line with the requirements of the EMPr will be managed, and, where relevant environmental best practice and how they will practically ensure that the objectives of the EMPr are achieved;
- Convey the contents of this EMPr to the construction site staff and discuss the contents in detail with the contractor;
- Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMPr;
- Take appropriate action if the specifications contained in the EMPr are not followed;
- Monitor and verify that environmental impacts are kept to a minimum, as far as possible;
- Order the removal from the construction site of any person(s) and/or equipment in contravention of the specifications of the EMPr;
- Report any non-compliance or remedial measures that need to be applied to the appropriate

environmental authorities, in line with the requirements of the EMPr;

- Submitting a report at each site meeting which will document all incidents that have occurred during the period before the site meeting;
- Ensuring that the list of transgressions issued by the ECO is available on request; and
- Maintain an environmental register which keeps a record of all incidents which occur on the site during construction. These incidents include:
 - Public involvement/complaints.
 - Health and safety incidents.
 - Incidents involving hazardous materials stored on site.
 - Non-compliance incidents.

- . Complete compliance will result in a 100% score.

Table 2.3-1: Impact Assessment and Risk Rating (Rehabilitation of the Klip Middle Soweto WMU)

Activities	Impacts	Aspects affected	Phase	Significance rating	Typical mitigation measures
A. DESIGN & PLANNING PHASE					
<p>Site Assessment Demarcate areas and zones for construction phase and operation rehabilitation activities. Consultations with relevant authorities on site requirements</p>	<p>Land to be cleared of vegetation Change of land use of identified site(s) land users</p>	<p>Animals using the habitat</p>	<p>Design and Planning</p>	<p>Low</p>	<p>Careful consideration to reduce the footprint of the rehabilitation programme not to increase impact to the environment. Construction camp can be located on previously disturbed areas (if possible) and should be located outside the 1-100 year flood line of the watercourse. Low noise machinery to be sourced.</p>
<p>Site Preparation Recruitment of local site workers Training of site workers; Safety and site management, environmental induction, wetland and rehabilitation. Source Personal Protective Equipment (PPE) safety equipment Consultation with a qualified botanist on the type of plants suitable for different types of soils for each site within the identified zones.</p>	<p>Job creation Skills development Personnel safety Natural vegetation maintained and re-generated through seedlings and transplanting</p>	<p>Employees and the community from which the work force is sourced</p>	<p>Design and Planning</p>	<p>Low</p>	<p>Local community personnel to be sourced/recruited for rehabilitation. Local site workers to undergo extensive safety and environmental induction training on environmental and wetland rehabilitation requirements including worker behavior on site. Site Specific vegetation, seeds and mulch to be sourced and stored correctly before use</p>

B. CONSTRUCTION PHASE				
<p>Construction camp</p> <p>Clear the site for construction</p> <p>Remove vegetation</p> <p>Prepare soil for construction</p> <p>Use of machinery during construction</p> <p>Ablution facilities installation</p> <p>Grading/leveling of the landscape</p>	<p>Damage to top soil;</p> <p>Compaction of soil;</p> <p>Soil pollution due to oil leaks from machinery;</p> <p>Loss of vegetation;</p> <p>Dust generation;</p> <p>Noise from machinery, equipment and personnel;</p>	<p>Surrounding community;</p> <p>Streams affected by sewage pollution;</p> <p>Soil and subsistence farmers.</p>	<p>Construction</p>	<p>Medium</p> <p>Bare surfaces must be managed as small as possible</p> <p>All personnel to use the construction environmental management programme guidelines to reduce machinery and personnel noise levels to low</p> <p>Soil erosion and soil pollution to be minimised by implementing the Construction site environmental management programme and guidelines.</p> <p>Dust suppression measures to be implemented.</p> <p>Site for construction to be placed where alien invasive plant species are demarcated for removal as part of the rehabilitation intervention.</p> <p>Sanitation facilities must not be located within 50 m of any water resources or water drainage areas. Facilities must be regularly checked and serviced regularly to reduce risk of soil pollution, surface water and groundwater pollution.</p>
<p>Installation of fencing and gates</p>	<p>Damage to top soil;</p> <p>Siltation;</p> <p>Compaction of soil/rutting</p>	<p>Excavation</p>	<p>Construction</p>	<p>Low</p> <p>Material required for fencing must be stored at a clearly demarcated area like the contractor camp. This camp must be located close to the area earmarked for infrastructure like ablution facilities in order to centralize the impacted area.</p>
		<p>Casting of foundations for poles</p> <p>Delivery of material</p>		
<p>Soil Erosion Management of</p>	<p>Ripping/loosening of soil</p>	<p>River banks</p> <p>River due to high silt</p>	<p>Construction</p>	<p>Medium</p> <p>Vegetation clearing on the site should take place only immediately prior to construction</p>

<p>construction vehicles. Vegetation clearing. Erosion management.</p>	<p>River banks eroded Exposure of soil, increased erosion levels due to run-off of water. Little precipitation and evaporation, loss of habitat life Soil erosion Soil pollution - waste illegal dumping Soil health for indigenous vegetation growth</p>	<p>and sedimentation</p>			<p>in order to minimise the time the soil is bare, thus minimising soil erosion, dust and visual impacts. Once earthworks are complete, disturbed areas are to be stabilised to prevent erosion. All construction vehicles and machinery and equipment must be properly maintained to prevent leaks.</p>
<p>Waste management</p>	<p>An increase in the amount of litter being generated Non-use of sanitation facilities</p>		<p>Construction</p>	<p>Medium</p>	<p>Environmental awareness induction training must be conducted to address the general site and sanitation facilities management. Site management procedures and guidelines must be implemented and all waste and rubble must be collected in appropriate waste receptacles and disposed of at the nearest authorised landfill site.</p>
<p>Plant and seed material harvesting Harvest seeds and seedlings to be used for re-vegetation Harvest mulch from trees to be used for mulching process Set up plant and seed nursery at construction camp for all species to be</p>	<p>Loss of vegetation and species of conservation value</p>	<p>Seed harvesting Animals using the plants as habitats</p>	<p>Construction</p>	<p>Low</p>	<p>Ensure minimum amounts of seeds are harvested without presenting further impacts to the environment Ensure careful harvesting of trees for mulch; when harvesting for mulch, every third or fourth tree or large shrub will be cut at 30 mm above ground so as not to change the habitat too drastically;</p>

used for re-vegetation.							
Clearing of silt on the river banks and inlet to wetland	Impact posed by Damage to bank due to sediment transport.	Ripping/loosening of soil Material Stockpile Grading/leveling of the landscape	Construction	Medium	Bare surfaces must be managed as small as possible. The side slopes of topsoil must be less than 1:3 (v:h). The landscape must blend with the surrounding areas to avoid water ponding.		
C. OPERATION PHASE							
C.1 Wetland rehabilitation							
Erosion Control	Altering of banks. Impeding the flow. Changing the watercourse. Siltation & sedimentation	Construction of berms Storm water structures revegetation of bare areas	Operation	Medium	Activities within 500 m measured from the center of the stream are deemed water uses in line with Section 21(c) of the NWA. Berms and storm water channels must be considered during the construction phase in order to divert clean runoff from the external catchment away from the disturbed areas.		
Storm Water and Flood Management	Houses located within the 1-100 year flood lines pose a risk. Reduction in design capacity of the culvert due to silted up culvert crossings	Location of infrastructure in the flood lines Maintenance of hydraulic structures Infilling of excavation	Operation	Medium	A maintenance schedule for clearing silt at the culvert crossing must be designed and implemented. Flood protection structures like attenuation walls must be designed and constructed for residential dwellings located within the flood risk areas.		

Blocked Sewer lines and Waste Water treatment plants. Illegal Waste Disposal Residential Development Activities	Mine related water quality impacts such as Acid Mine Drainage from defunct Mines. Raw sewage flowing to the streams Storm Water Pollution due to illegal domestic waste disposal sites Deterioration of water quality	Users of water	Operation	Medium	Ensure Proper water resource protection measures Enforce Section 19 of NWA which places a duty on everyone to avoid pollution and degradation of water resources. Conduct public awareness educating people about importance and function of water resources i.e. wetland Ensure Proper Waste Management Measures.
Disposal of domestic waste and building rubbles Waste Sorting Waste Transportation Waste Disposal	Water Quality deterioration due to disposal of waste at water resources.		Operation	Medium	Implement Waste collection and sorting from the source. Ensure Proper Waste Management Measures. Public Awareness regarding importance and function of water resource
Removal of alien invasive species	Soil roughness Exposure of soil, increased erosion levels due to run-off of water. Little precipitation and evaporation, loss of habitat life, reduced water table levels.	Soil and indigenous species that depend on alien vegetation	Operation	Low	Re-vegetation of indigenous species will be implemented as a mitigation measure
Sediment and erosion control	Alteration of the river bank and impeding water flow, Changing the watercourse. Siltation & sedimentation. Vegetation removal,		Operation	Low	Re-vegetation of indigenous species will be implemented as a mitigation measure

<p>Mulching of slopes and banks (Stabilisation of slopes using geotextile; seeding slopes to get them ready for mulching; Layering slopes with mulch)</p>	<p>Altering the river bank and impeding structures.</p> <p>Trampling, damage to topsoil, tree felling, nutrient overload, weed contamination</p>	<p>Water quality, soil integrity, riparian vegetation</p>	<p>Operation</p>	<p>Low</p> <p>Use of organic mulches only (based on wood products); mulch from trees is to be applied when dry so as to eliminate chemical impact on soil; cutting down of trees (especially indigenous trees) is temporary loss as the trees will resprout with time. Monitoring of alien invasion or weed encroachment after mulching process.</p>
<p>Installation of erosion control fences</p>	<p>Impact posed by damage to bank and slopes through excavation of topsoil for installation of metal stakes for fence (iron standard fence and wire netting) by digging holes on ground or slope; trampling</p> <p>Top soil will be susceptible to erosion; run-off of soil during rain events that may cause sedimentation, poor water quality, riparian vegetation disturbed.</p>	<p>Streams that will be silted and users of water who depend on non polluted water.</p>	<p>Operational</p>	<p>Low</p> <p>Fences will be used with mulch for effective water control and microclimate creation; when placing mulched fences, the work will be done around existing vegetation; trampled sections will quickly regrow.</p>
<p>Stone Gabions construction and installation</p> <p>Dredging for installation of gabions; trampling; excavation of soil and vegetation, impeding of water flow</p>	<p>Riparian zone banks and vegetation; flow regime; sedimentation; water quality, habitat loss for invertebrates and microscopic organisms living under rocks</p>	<p>Users of water</p>	<p>Operation</p>	<p>Medium</p> <p>Gabions preferably used with geotextiles to reduce water velocities and to recapture river bed sediment; during construction of gabion structures, the correct height, shape and foundation will be relevant to site being rehabilitated; qualified engineers will be consulted on appropriate gabion structures and installations; microscopic organisms and invertebrates will obtain new habitat under rocks within habitat; once gabions are installed properly, vegetation will regrow and sedimentation and erosion will cease</p>

<p>Installation of River mattress Dredging for installation of gabions; trampling; excavation of soil and vegetation.</p>	<p>Riparian zone banks and vegetation; flow regime; sedimentation; water quality.</p>	<p>Users of water</p>	<p>Operation</p>	<p>Medium</p>	<p>River Mattresses preferably used with geotextiles to reduce water velocities and to recapture river bed sediment; during construction of river mattress structures, the correct height, shape and foundation will be relevant to site being rehabilitated; qualified engineers will be consulted on appropriate river mattress structures and installations; once river mattresses are installed properly, vegetation will regrow and sedimentation and erosion will cease</p>
<p>Sediment control using silt fence</p>	<p>Impact posed by damage to bank and slopes through excavation of topsoil for installation of wood stakes for fence by digging holes on ground or slope; trampling Top soil will be susceptible to erosion; run-off of soil during rain events that may cause sedimentation, poor water quality, riparian vegetation disturbed, flow regime disturbed; trenching.</p>	<p>Those who depend on the streams.</p>	<p>Operation</p>	<p>Low</p>	<p>When installing the fence tree roots are present then installation needs to be done around the roots so that they are not cut down; slope gradient will be considered; soil type must also be considered; inspection and monitoring required after installation</p>

<p>Sediment control using gravel bags</p>	<p>Clogging of gravel bags resulting in poor water quality, gravel changing flow bursting of gravel bags bags water regime,</p>	<p>Water quality, flow regime, aquatic fauna and flora habitat disturbance</p>	<p>Operation</p>	<p>Low</p>	<p>The gravel bags need to be inspected prior to forecast rain, during extended rain events, after rain events and weekly during the rainy season. If the gravel bags are exposed to sunlight for a prolonged period, they will need to be replaced every three months due to the degradation of the bags by the sun; the bags will need to be replaced sediment accumulate in the bags must be removed periodically in order to maintain the effectiveness of the bags. Inspection and maintenance must be reshaped and as needed; that will be carried out throughout the lifespan of the process.</p>
<p>Treating footpaths using organic mulch</p>	<p>Disturbance of flow regime (water flow along path to be rehabilitated must be stopped); Trampling vegetation and habitat; water pollution</p>	<p>Water quality and flow; Riparian and surrounding vegetation Stream users.</p>	<p>Operation</p>	<p>Low</p>	<p>This method of rehabilitation is only suitable for flat surfaces and moderate slopes; rooted plants on the paths to be rehabilitated should not be removed; path-forming animals must be removed or reduced; area being treated should also be demarcated so that people do not continuously trample on it.</p>
<p>Preventing overgrazing of wetland vegetation and animal footpaths (rotational grazing)</p>	<p>Reduced grazing time; more time for vegetation to grow and recover; less waterlogged soils Vegetation, soil, water quality</p>	<p>Livestock</p>	<p>Operation</p>	<p>High</p>	<p>Rotational grazing will ensure that the wetland capacity for grazing is not exceeded and that animal trampling will be maintained at low levels as animals will not be grazing on the wetlands all the time. This also ensures that when soils are waterlogged, they cannot be worsened by</p>

<p>trampling as animals will only graze when conditions are favourable</p>					<p>Invasive alien species control; Soil disturbance; soil and water contamination from petrol or oil (if using mechanised method and herbicides); Death of aquatic life due to water contamination; Riparian zone disturbance; Death of non-target species</p>
<p>Only herbicides registered for use on a specific species must be used; herbicides must only be sprayed during active growing of plants; plants need to be sprayed before the seeds are produced (namely between flowering and fruit set); herbicides must not be applied during the wet seas (before or after rain) as they will wash away into rivers and watercourses and contaminate them; manual removal using mechanised tools is effective in removal of dense stands of aliens; manual removal of alien invasive species is only</p>	<p>Medium</p>	<p>Operation</p>	<p>Aquatic life</p>	<p>Water quality; soil; aquatic fauna and flora; human and animal health can be affected due to herbicides.</p>	
<p>Transplanting of small seedlings from an area where they are abundant is advisable as small seedlings are likely to transplant more successfully than large ones; plants with vigorous rooting growth are preferential and must be used as they accelerate natural plant succession; all planting will need to be followed by some form of micro-habitat treatment such as mulching with local plant material or using surface geotextile or moisture capturing hollows. It is also advisable to plant when the wet season has begun in order to eliminate the need for watering plants; monitoring is vital to ensure that the thick layer of vegetation is successfully created with minimal environmental impact; a qualified botanist must be consulted on the type of plants suitable for different types of soils etc.</p>	<p>Medium</p>	<p>Operational</p>	<p>Soil; riparian and surrounding vegetation</p>		<p>Bank stabilisation using soil bioengineering techniques (establishing a dense cover on soil protecting plants) Digging on banks and surrounding landscape when preparing soil for planting; trampling;</p>

C.3 Development of Parks

<p>Installation of fencing and gates</p>	<p>Damage to top soil; Siltation; Compaction of soil / rutting</p>	<p>Excavation Casting of foundations for poles Delivery of material</p>	<p>Operation</p>	<p>Low</p>	<p>Material required for fencing must be stored at a clearly demarcated area like the contractor camp. This camp must be located close to the area earmarked for infrastructure like ablation facilities in order to centralise the impacted area.</p>
<p>Erosion Control</p>	<p>Altering of banks; Impeding the flow; Changing the watercourse; Siltation & sedimentation.</p>	<p>Construction of berms Storm water structures Revegetation of bare areas</p>	<p>Operation</p>	<p>Medium</p>	<p>Activities within 500 m measured from the center of the stream are deemed water uses in line with Section 21(c) of the NWA. Berms and storm water channels must be considered during the construction phase in order to divert clean runoff from the external catchment away from the disturbed areas.</p>
<p>Storm Water and Flood Management</p>	<p>Houses located within the 1:100 year flood lines pose a risk. Reduction in design capacity of the culvert due to silted up culvert crossings</p>	<p>Location of infrastructure in the flood lines Maintenance of hydraulic structures Infilling of excavation</p>	<p>Operation & Decommissioning</p>	<p>Medium</p>	<p>A maintenance schedule for clearing silt at the culvert crossing must be designed and implemented. Flood protection structures like attenuation walls must be designed and constructed for residential dwellings located within the flood risk areas.</p>
<p>Deterioration of water quality</p>	<p>Acid Mine Drainage from defunct Mines; Raw sewage flowing to the streams; Storm Water Pollution due to illegal domestic waste disposal sites; Use of machinery during construction;</p>	<p>Mine related water quality impacts Blocked Sewer lines and Waste Water treatment plants. Illegal Waste Disposal Residential Development Activities</p>	<p>Construction</p>	<p>Medium</p>	<p>Proper water resource protection measures like "Polluter Pays Principles" must be enforced.</p>

Disposal of domestic waste and building rubbles	Dust generation. Water Quality deterioration due to disposal of waste at water resources.	Waste Sorting	Construction	Medium	Ensure Waste collection and sorting from the source. Proper Waste Management Measures.
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Table 2.3-2. Impact Assessment and Risk Rating (Rehabilitation of the Klip Middle Soweto)

Decommissioning Phase

D. DECOMMISSIONING PHASE				
Site Closure		Soil	Decommissioning	Medium
Demolish construction camp on site without impact to environment	Soil disturbance and exposure from demolition works	Air quality		
Remove any soil or plant material stockpiles	Visual impact - Dust generation due to demolition works	Soil and biodiversity		
Demolish the temporal plant and seedlings nursery	Loss of soil and vegetation	Surface water quality		
Site clean up	Soil pollution and groundwater pollution	Ground water quality		
Remove all waste material types and dispose properly and at registered landfill site.	Water quality impacts of demolition works near water features			
All equipment and machinery must be properly removed from site	Construction noise - Demolition activity will generate noise from vehicles, machinery, equipment and personnel	Loss of employment and source of income		
Remove all sanitation facilities from site	Loss of income to temporary employed community members			
Ensure the closed site does not present any safety risk to human or environment				
Ensure proper project handover to relevant				
				Implement proper site closure procedures and guidelines as per the approved EMP
				Engage municipality Parks and Environment Departments responsible for maintenance of wetlands and parks in the area to provide opportunities to the trained community members. The team members might be used in the monitoring of the rehabilitated areas and future wetland rehabilitation programmes to be implemented by the municipality.

community authorities for monitoring and maintenance					
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Table 2.3-3: Representation of site specific rehabilitation activities within each identified and assessed wetland Zone.

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
<p>Site Assessment and Preparation</p> <ul style="list-style-type: none"> - Site clearing - Demarcation of construction camp and rehabilitation areas 	<p>Implement construction operations guidelines and EMPr</p>	<p>Damage to top soil; Compaction of soil; Soil loss due to excavation for poles to fence off construction camp</p>	<p>Land to be cleared of vegetation Change of land use of identified site(s)</p>	<p>Design & Planning</p>	<p>Careful consideration to reduce the footprint of the rehabilitation programme not to increase impact to the environment. Construction camp can be located on previously disturbed areas (if possible) and should be located outside the 1:100 year flood line of the watercourse. Low noise machinery to be sourced. Local community personnel to be sourced/recruited for rehabilitation. Local site workers to undergo extensive safety and environmental induction training on environmental and wetland rehabilitation requirements including worker behaviour on site.</p>
<p>Construction of site camp:</p> <ul style="list-style-type: none"> - Delivery and temporal storage of Material - Delivery and temporal storage of Machinery and Equipment 	<p>Implement construction operations guidelines and EMPr</p>	<p>Soil pollution due to oil leaks from machinery Loss of vegetation Dust generation Noise from machinery, equipment and personnel Use of machinery during construction Ablution facilities</p>	<p>Job creation Skills development Personnel safety Natural vegetation maintained and re-generated through seedlings and transplanting</p>	<p>Construction Phase</p>	<p>Bare surfaces must be managed as small as possible. All personnel to use the construction environmental management programme guidelines to reduce machinery and personnel noise levels to low. Soil erosion and soil pollution to be minimised by implementing the Construction site environmental management programme and guidelines. Dust suppression measures to be implemented. Site for construction to be placed where alien invasive plant species are demarcated for removal as part of the rehabilitation intervention.</p>

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
		installation			Sanitation facilities must not be located within 50m of any water resources or water drainage areas. Facilities must be regularly checked and serviced regularly to reduce risk of soil pollution, surface water and groundwater pollution. Site Specific vegetation, seeds and mulch to be sourced and stored correctly before use
REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
Mulching of slopes and banks (Stabilisation of slopes using geotextile; seeding slopes to get them ready for mulching; Harvesting of trees for mulching, Layering slopes with mulch)	Use of organic mulches only (based on wood products).	Trampling, damage to topsoil, tree felling, nutrient overload, weed contamination	Water quality, soil integrity, riparian vegetation	Operation	Careful harvesting of mulch material; Apply mulch from trees when dry to eliminate chemical impact on soil; When harvesting for mulch, every third or fourth tree or large shrub will be cut at 30 mm above ground so as not to change the habitat too drastically; Cutting down of trees (especially indigenous trees) is temporary loss as the trees will resprout with time; Monitoring of alien invasion or weed encroachment after mulching process.
Installation of erosion control fences	Fences will be used with mulch for effective water control and microclimate creation	Impact posed by damage to bank and slopes through excavation of topsoil for -Installation of metal stakes for fence (iron standard fence and wire netting) by digging holes on	Top soil will be susceptible to erosion; run-off of soil during rain events that may cause sedimentation, poor water quality, riparian vegetation disturbed	Operation	When placing mulched fences, the work will be done around existing vegetation; Trampled sections will quickly regrow

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
Stone Gabions construction and installation (gabion baskets, box gabions and gabion mattresses)	Gabions preferably used with geotextiles to reduce water velocities and to recapture river bed sediment;	ground or slope; trampling Dredging for installation of gabions; trampling; excavation of soil and vegetation, impeding of water flow	Riparian zone banks and vegetation; flow regime; sedimentation; water quality, habitat loss for invertebrates and microscopic organisms living under rocks	Construction and Operation	During construction of gabion structures, the correct height, shape and foundation will be relevant to site being rehabilitated; Qualified engineers will be consulted on appropriate gabion structures and installations; microscopic organisms and invertebrates will obtain new habitat under rocks within habitat; Once gabions are installed properly, vegetation will regrow and sedimentation and erosion will cease.
Installation of River mattress	River Mattresses preferably used with geotextiles to reduce water velocities and to recapture river bed sediment.	Dredging for installation of gabions; trampling; excavation of soil and vegetation.	Riparian zone banks and vegetation; flow regime; sedimentation; water quality.	Construction and Operational	During construction of river mattress structures, the correct height, shape and foundation will be relevant to site being rehabilitated; Qualified engineers will be consulted on appropriate river mattress structures and installations; Once river mattresses are installed properly, vegetation will regrow and sedimentation and erosion will cease
Sediment control using silt fence	Installing the silt fence with consideration on the slope gradient and soil type.	Impact posed by damage to bank and slopes through excavation of topsoil for installation of wood stakes for fence by digging holes on ground or slope; trampling	Top soil will be susceptible to erosion; run-off of soil during rain events that may cause sedimentation, poor water quality, riparian vegetation disturbed, flow regime disturbed; trenching	Operational	When installing the fence tree roots are present then installation needs to be done around the roots so that they are not cut down; Slope gradient will be considered; Soil type must also be considered; Inspection and monitoring required after installation
Sediment control using	Use of gravel bags	Alteration of the river bank and	River bank, riparian	Operational	Re-vegetation of indigenous species will be

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
gravel bags		<p>impeding water flow,</p> <p>Changing the watercourse. Siltation & sedimentation. Vegetation removal, Altering the river bank and impeding structures</p> <p>Clogging of gravel bags resulting in poor water quality, gravel changing flow bursting of gravel bags bags water regime,</p>	<p>zones, vegetation loss</p> <p>Water quality, flow regime, aquatic fauna and flora habitat disturbance</p>		<p>implemented as a mitigation measure</p> <p>The gravel bags need to be inspected prior to forecast rain, during extended rain events, after rain events and weekly during the rainy season.</p> <p>If the gravel bags are exposed to sunlight for a prolonged period, they will need to be replaced every three months due to the degradation of the bags by the sun;</p> <p>The bags will need to be reshaped and replaced as needed;</p> <p>Sediment that will accumulate in the bags must be removed periodically in order to maintain the effectiveness of the bags.</p> <p>Inspection and maintenance must be carried out throughout the lifespan of the process.</p>
Treating footpaths using organic mulch	Rehabilitate only in flat surfaces and moderate slopes;	Disturbance of flow regime (water flow along path to be rehabilitated must be stopped); trampling vegetation and habitat; water pollution	Water quality and flow; riparian and surrounding vegetation	Operational	<p>Retain rooted plants on the paths to be rehabilitated;</p> <p>Remove or reduce path-forming animals;</p> <p>Clear demarcation of area being treated so that people do not continuously trample on it.</p>

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
Preventing overgrazing of wetland vegetation and animal footpaths (rotational grazing)	Rotational grazing will ensure that the wetland capacity for grazing is not exceeded.	Reduced grazing time; more time for vegetation to grow and recover; less waterlogged soils	Vegetation, soil, water quality	Operational and Decommissioning	Determine grazing capacity for the wetland Monitor rotational grazing to ensure that the wetland capacity for grazing is not exceeded Ensure maintenance of animal trampling is kept at low levels by monitoring grazing times as animals will not be grazing on the wetlands all the time. This also ensures that when soils are waterlogged, they cannot be worsened by trampling as animals will only graze when conditions are favourable
Invasive alien species control	Removal of invasive alien species using different control methods. Only herbicides registered for use on a specific species must be used.	Soil roughness Exposure of soil, increased erosion levels due to run-off of water. Little precipitation and evaporation, loss of habitat life, reduced water table levels Soil disturbance; soil and water contamination from petrol or oil (if using mechanised method and herbicides); death of aquatic life due to water contamination; riparian zone disturbance; death of	Soil and indigenous species that depend on alien vegetation Water quality; soil; aquatic fauna and flora; human and animal health can be affected due to herbicides;	Construction Operational	Manual removal using mechanised tools is effective in removal of dense stands of aliens; Manual removal of alien invasive species is only effective in areas with low infestations; Herbicides must only be sprayed during active growing of plants; Plants need to be sprayed before the seeds are produced (namely between flowering and fruit set); - herbicides must not be applied during the wet seas (before or after rain) as they will wash away into rivers and watercourses and contaminate them; Biocontrol agents that may threaten commercial populations of target species that exist nearby Re-vegetation of indigenous species will be

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
		non-target species			implemented as a mitigation measure.
Bank stabilisation using Soil bioengineering techniques (establishing a dense cover of soil protecting plants)	Transplant small seedlings from an area where they are abundant Choose plants with vigorous rooting growth are preferential and must be used as they accelerate natural plant succession;	Digging on banks and surrounding landscape when preparing soil for planting; trampling;	Soil; riparian and surrounding vegetation	Construction	Careful and proper methods for transplanting of small seedlings to be used. Select plants with vigorous rooting growth are preferential and must be used as they accelerate natural plant succession; Ensure that all planting will be followed by some form of micro-habitat treatment such as mulching with local plant material or using surface geotextile or moisture capturing hollows. Consult a qualified botanist on the type of plants suitable for different types of soils etc. Source the recommended site specific plants

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
				Operation	<p>make use of small seedlings as they are likely to transplant more successfully than large ones;</p> <p>It is advisable to plant when the wet season has begun in order to eliminate the need for watering plants;</p> <p>Monitoring is vital to ensure that a thick layer of vegetation is successfully created with minimal environmental impact;</p>
<p>Addressing illegal dumping through river clean ups (clearing of debris in water, clearing of blocked culverts and more)</p> <p>Dumping of yard waste into the seasonal zone of a wetland</p>	<p>Environmental education and presentations need to be carried out for participants of the watercourse clean ups; after the clean ups, there must be monitoring to ensure that no litter or any other pollutants are dumped in the watercourses; debris hindering water flow needs to be removed for watercourses; watercourse clean ups need to be more frequent; environmental education for residents is also a</p>	<p>Trampling; temporary disturbance of fauna during the process</p>	<p>Soil, invertebrates, vertebrates and mammals</p>	<p>Construction</p>	<p>Source equipment and machinery for the clean up</p> <p>Remove all debris from the watercourses that hinders water flow</p>
				Operational	<p>Proper wetland clean-up procedures must be followed.</p> <p>Environmental education and presentations through training need to be carried out for participants of the watercourse clean ups;</p> <p>Incorporate the watercourse management environmental education programme as part of the existing community environmental awareness for residents.</p> <p>Ensure strict monitoring after the clean ups so that no litter or any other pollutants are dumped in the</p>

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
	necessity.				watercourses; Regular watercourse clean ups need to be implemented;
Preventing unsustainable reed harvesting	Harvesting seasons need to be implemented and enforced,	Wetland will be able to perform important functions such as flood attenuation, sediment control, water purification, provision of habitat for fauna and avifauna Wetland will be able to perform important functions such as flood attenuation, sediment control, water purification, provision of habitat for fauna and avifauna	Soil; water quality; fauna; water flow	Operational and Decommissioning	Determine reasonable harvest yield for the site; Reasonable yields should also be set; Implement educational awareness campaign on sustainable reed harvesting methods; Regulate Harvesting: should only be allowed at certain times during certain conditions; Fines should be set for illegal harvesting as determined by the authorities and by-laws. Enforce by-laws
Soil and ground movement during rehabilitation activities in stream areas.	Archaeologist to check initial site clearance with construction crew for possible heritage resources.	Disturbance of unidentified heritage resources – chance finds Destruction of undiscovered subsurface heritage	Heritage	Construction and Operational	Site Assessment by Archaeologist Where any significant resources are found the archaeologist must assess and make the appropriate mitigation requirements. Stop construction if any heritage resources – such as graves; human remains or fossils are identified.

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
		<p>resources during construction activities.</p> <p>The severity of the impact on heritage resources found during construction will be medium and will be in most cases be localised. The probability of such chance finds occurring is low.</p> <p>After mitigation the severity of impact will be minimal with the implementation of mitigation measures.</p>			
<p>Clearing of silt on the river banks and inlet to wetland</p>	<p>Ripping/loosening of soils</p> <p>Material stockpile</p> <p>Grading, levelling of the landscape</p> <p>Place Laydown areas for temporal storage of silt. Laydown areas must be as close as possible and manage their footprint to be as small as possible.</p>	<p>Impact posed by Damage to bank due to sediment transport.</p>	<p>Soil and river banks</p>	<p>Construction and Operational</p>	<p>Bare surfaces must be managed as small as possible.</p> <p>The side slopes of topsoil must be less than 1:3 (v:h).</p> <p>The landscape must blend with the surrounding areas to avoid water ponding.</p>

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
	<p>Stockpile the silt temporarily before off site disposal</p> <p>Ensure the side slopes of topsoil must be less than 1:3 (v:h)</p> <p>Impede the flow velocity and reduce soil erosion by widening the water course.</p>				
<p>Installation of fencing and gates for access control:</p>	<ul style="list-style-type: none"> • Excavation of poles • Casting for foundation of poles • Construction camp may be required for storage of construction material • Vegetation cleared for the construction of contractor camp • Delivery of material 	<p>Damage to top soil; Siltation; Compaction of soil / rutting</p>	<p>Excavation</p> <p>Casting of foundations for poles</p> <p>Delivery of material</p>	<p>Construction</p>	<p>Material required for fencing must be stored at a clearly demarcated area like the contractor camp. This camp must be located close to the area earmarked for infrastructure like ablution facilities in order to centralize the impacted area.</p>
<p>Erosion Control:</p>	<ul style="list-style-type: none"> • Re-vegetation of bare areas; this aspect is deemed a positive impact as vegetation provides 	<p>Construction of berms</p> <p>Storm water structures</p> <p>re-vegetation of bare</p>		<p>Construction & Operational</p>	<p>Activities within 500m measured from the center of the stream are deemed water uses in line with Section 21(c) of the NWA.</p> <p>Berms and storm water channels must be considered during the construction phase in order to divert clean</p>

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
	support for loose material.	areas			runoff from the external catchment away from the disturbed areas.
Storm Water and Flood Management: Construction of berms storm water structures.	- Address issue of residential areas within the 1-100 year flood area - Install flood protection berms - Maintenance of hydraulic structures	Houses located within the 1:100 year flood lines pose a risk. Reduction in design capacity of the culvert due to silted up culvert crossings	Location of infrastructure in the flood lines Maintenance of hydraulic structures Infilling of excavation	Construction & Operational	A maintenance schedule for clearing silt at the culvert crossing must be designed and implemented. Flood protection structures like attenuation walls must be designed and constructed for residential dwellings located within the flood risk areas. Apply the municipal storm water management by-laws and guidelines
Deterioration of water quality:	Water quality control measures must be implemented from the source of pollution. (mining and related activities) - Construction activities are associated with the generation of dust. - Dust suppression measures must be in place at construction camp sites.	Acid Mine Drainage from defunct Mines. Raw sewage flowing to the streams. Storm Water Pollution due to illegal domestic waste disposal sites. Use of machinery during construction - Dust generation.	- Mine related water quality impacts - Blocked Sewer lines and Waste Water treatment plants. - Illegal Waste Disposal - Residential Development Activities	Construction & Operational	Ensure Proper water resource protection measures Enforce Section 19 of NWA which places a duty on everyone to avoid pollution and degradation of water resources. Implement construction site environmental impact management procedures including dust suppression; oil spills management; soil erosion control etc. Conduct public awareness educating people about importance and function of water resources i.e. wetland Ensure Proper Waste Management Measures.

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
	<ul style="list-style-type: none"> - Water pollution from failing waste water treatment plants. - The sewage treatment facilities must be designed and managed in such a manner that the final effluent complies to the receiving water quality objectives. - conduct audit to assess the sewage design capacity and treatment plants infrastructure if suitable for the population of Soweto. • Water pollution from dense settlements - Waste collecting and sorting measures must be implemented at dense settlement. 			Decommissioning	<p>Environmental education and presentations need to be carried out for participants of the watercourse clean ups; after the clean ups, there must be monitoring to ensure that no litter or any other pollutants are dumped in the watercourses; debris hindering water flow needs to be removed for watercourses; watercourse clean ups need to be more frequent; environmental education for residents is also a necessity.</p>

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
	New residential developments - These activities are still at the construction phase. Construction activities are associated with the generation of dust. - Dust suppression measures must be in place at residential development sites.				
Disposal of domestic solid waste and building rubble	Address the disposal of domestic waste and building rubbles Generation of waste: - - Waste will be generated during the construction and operational phases. - Construction waste will be generated during			Construction & Operational	Develop a waste management plan for each site to include waste collection, temporal storage, transportation and waste processing (recycling, reuse or disposal) Implement Waste collection and sorting from the source. Ensure Proper Waste Management Measures. Implement Community Waste Management Awareness programme Awareness regarding importance and function of water resource

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
	<p>the establishment of parks.</p> <ul style="list-style-type: none"> - Waste management at source - Waste must be temporarily stored in properly marked/colour coded bins. • Collection of Waste - Spillages may occur between collection, transportation and disposal. - Waste must be collected by a competent entity for safe disposal. Spillages must be remediated as soon as possible. • Disposal of waste. - Waste must be disposed of at registered water disposal sites. • Hazardous waste management - 				

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
	<p>storm water contamination</p> <ul style="list-style-type: none"> - Improper waste management, results in storm water which gets in contact with waste will be contaminated. - Hazardous waste like grease and oil may impact on surface runoff during storm events. <ul style="list-style-type: none"> • Actively enforce restrictions and by-laws on dumping in the wetland and the riverine systems. 				
<p>Preventing Overgrazing and animal trampling</p> <p>The first step in preventing overgrazing of wetlands is ensuring that the grazing capacity of the wetland is not exceeded</p>					

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
Improvement of waste collection and disposal at the communities to alleviate illegal disposal of waste;					
Construction of flood protection berms at areas located close to the water resource;					
Continuous Water quality monitoring must be undertaken and action/corrective measures must be implemented in order to protect the water resources;					
Conduct audit to assess the sewage design capacity and treatment plants infrastructure if they are suitable for the current population Soweto is having;					
Implement an educational programme for the people of Soweto about importance and value of wetlands and riverine systems;					

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
<p>site, to used later in groundwater modelling.</p> <ul style="list-style-type: none"> Groundwater from the new monitoring boreholes should be sampled quarterly, and water levels measured monthly. Water quality parameters to be monitored should include, but not limited to the following: pH, EC, TDS, Ca, Mg, Na, K, Fe, Mn, Cu, Pb, Zn, Cd, Cr, Cl, SO4, F, NO3, PO4, CO3, and HCO3 					
<p>Electromagnetic horizontal profiling is recommended in this regard</p>					
<p>Geophysical surveys lines should be parallel to the wetland in order</p>					

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
to locate fracture zone perpendicular to the wetland which channel groundwater to the wetland.					
A groundwater flow and transport model should be developed for the site. The model will be used to predict potential long-term impacts of groundwater on the wetland. The potential impacts to be simulated include migration of contaminants from outside sources to the wetland.					
Archaeologist to check initial site clearance with construction crew for possible heritage resources					
Stop construction if any heritage resources – such as graves, human remains or fossils are identified; and Where any significant resources are found the archaeologist must assess and make the					

PRE-REHABILITATION ACTIVITIES	REHABILITATION INTERVENTION	IMPACTS	ASPECT AFFECTED	PHASE	MITIGATION MEASURES
appropriate mitigation requirements					

Table 2.3-4: Alternative 1

Alternative 1 (Design and Method Alternative)				
Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Development of parks and wetlands rehabilitation	Same as proposal			
Demarcate special areas for livestock grazing to address overgrazing in Zones 2 and 3	High - Uncontrolled access to public space presents safety risk to public members and also the overgrazing of grass within the picnic sites. Although damage will be only localised to areas within Zone 2 and Zone 3.	Access control with fence and a lockable gate to allow a specific number of livestock only at certain times preferably after public has left the area for safety and hygiene purposes. Monitoring of grazing periods and time crucial to ensure proper maintenance of the facility.	Low	Shared open space with animals without proper animal control can lead to Public safety at risk especially children in the park or picnic area. Damage to grass and trees within the park especially the picnic site can be severe.

Table 2.3-5: Alternative 2 (Design and Method Alternative)

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented

<p>Development of parks and wetlands rehabilitation</p>	<p>Same as for proposal</p>			
<p>Demarcate special areas for livestock grazing to address overgrazing in all Zones</p>	<p>High - Same as Alternative 1, except the damage will be on a much larger scale (Zones 1-4) opposed to being localised only in Zone 2 and 3.</p>	<p>Access control with fence and a lockable gate to allow a specific number of livestock only at certain times preferably after public has left the area for safety and hygiene purposes. Monitoring of grazing periods and time crucial to ensure proper maintenance of the facility.</p>	<p>Low</p>	<p>Shared open space with animals without proper animal control can lead to Public safety at risk especially children in the park or picnic area. Damage to grass and trees within the park especially the picnic site can be severe.</p>

Table 2.3-6: Alternative 3 (Design and Method Alternative)

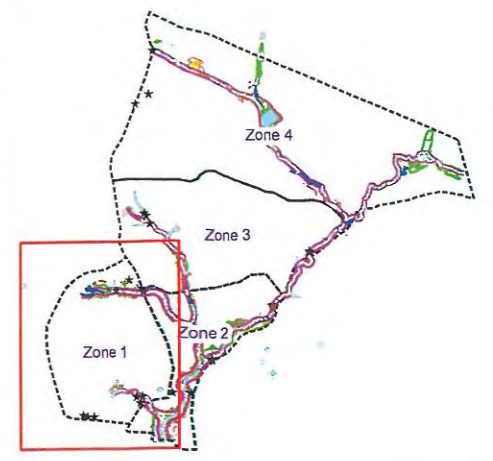
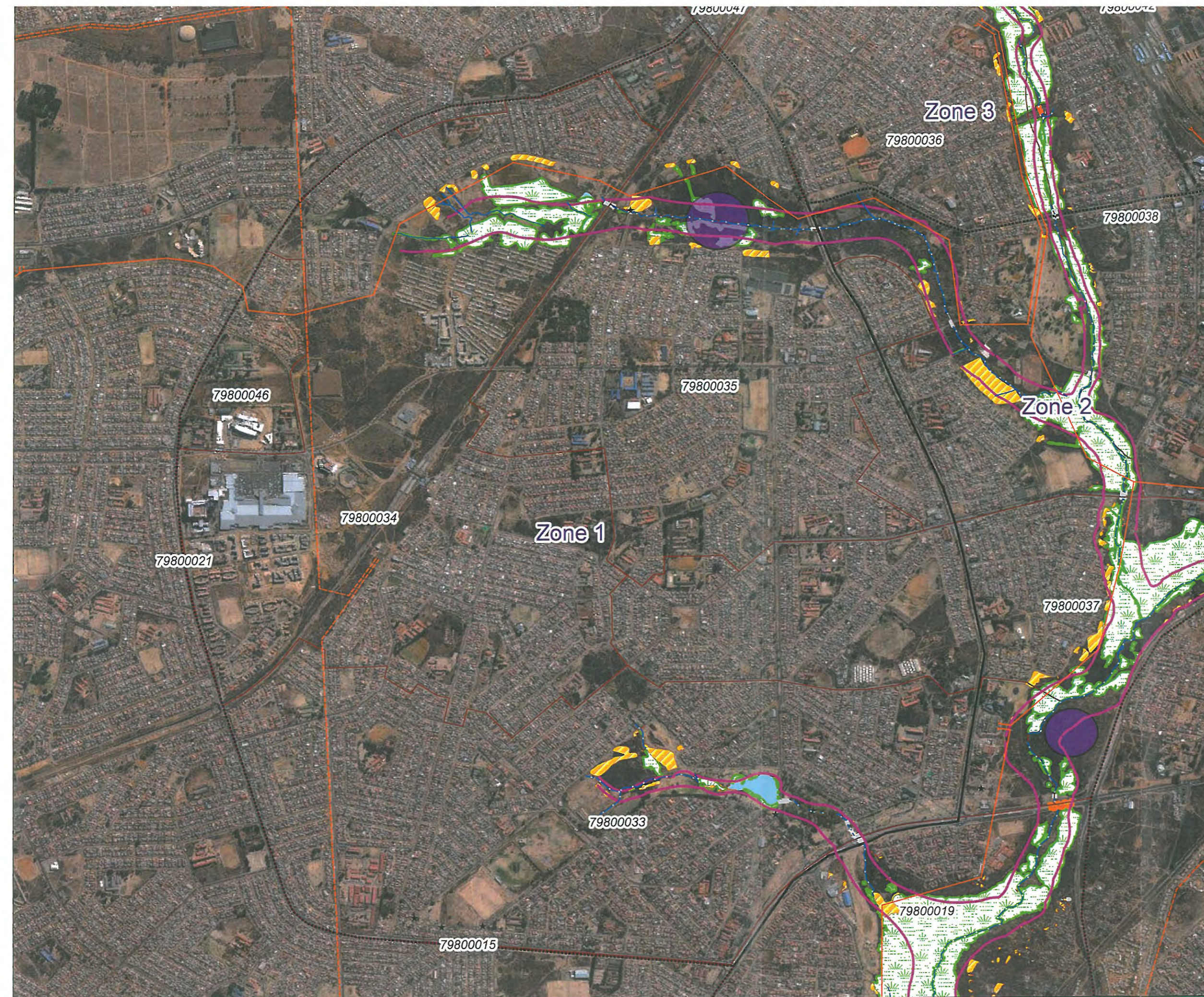
Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Development of parks and wetlands rehabilitation	Same as for proposal			
Demarcate special areas for livestock grazing to address overgrazing in Zones 2 and 3	Same as Alternative 1			
Installation of different gabion types at Zone 1, Zone 2 and Zone 3; Zone 1 - Gabions Zone 2 - Box gabions Zone 3 - Gabion mattresses (Stone Gabions construction and installation)	Medium - Dredging for installation of gabions; trampling; excavation of soil and vegetation, impeding of water flow;	Gabions preferably used with geotextiles to reduce water velocities and to recapture river bed sediment; during construction of gabion structures, the correct height, shape and foundation will be relevant to site being rehabilitated; qualified engineers will be consulted on appropriate gabion structures and installations; microscopic organisms and invertebrates will obtain new habitat under rocks within habitat; once gabions are installed properly, vegetation will regrow and sedimentation and erosion will cease	Low -	Riparian zone banks and vegetation; flow regime; sedimentation; water quality, habitat loss for invertebrates and microscopic organisms living under rocks

<p>Installation of River mattress</p>	<p>Medium - Dredging for installation of gabions; trampling; excavation of soil and vegetation.</p>	<p>Riparian zone banks and vegetation; flow regime; sedimentation; water quality.</p>	<p>Low -</p>	<p>River Mattresses preferably used with geotextiles to reduce water velocities and to recapture river bed sediment; during construction of river mattress structures, the correct height, shape and foundation will be relevant to site being rehabilitated; qualified engineers will be consulted on appropriate river mattress structures and installations; once river mattresses are installed properly, vegetation will regrow and sedimentation and erosion will cease</p>
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Map Index

- Map of Zone 1: Areas to be rehabilitated
- Map of Zone 2: Areas to be rehabilitated
- Map of Zone 3: Areas to be rehabilitated
- Map of Zone 4: Areas to be rehabilitated

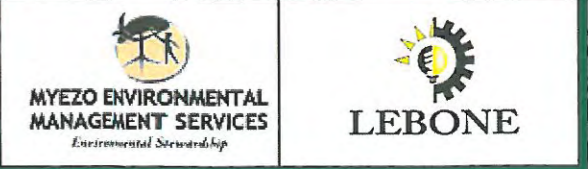
MAP OF ZONE 1 AREAS TO BE REHABILITATED



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 - Waypoints_21-FEB-13.gpx
 - 133-1000_Power_Line
 - 44-132_Power_Line
 - Flow_Direction_Lines
 - Retaining_Wall_Lines
 - Streams_River_Lines
 - 1in100years_Floodline
 - Soweto_WM Zone_1
 - Wards_2011
 - Wiers_Areas
 - Bridges_Areas
 - Culverts_Areas
 - Illegal_Dump_Poly_areas
 - Wetlands
 - Water-Body_areas
- Intervention_Areas**
- Name**
- Erosion_Control_Fences
 - Gravel_Bags
 - Mulching

Projection: Transverse Mercator
 Datum: WGS 1984
 Linear Unit: Meters

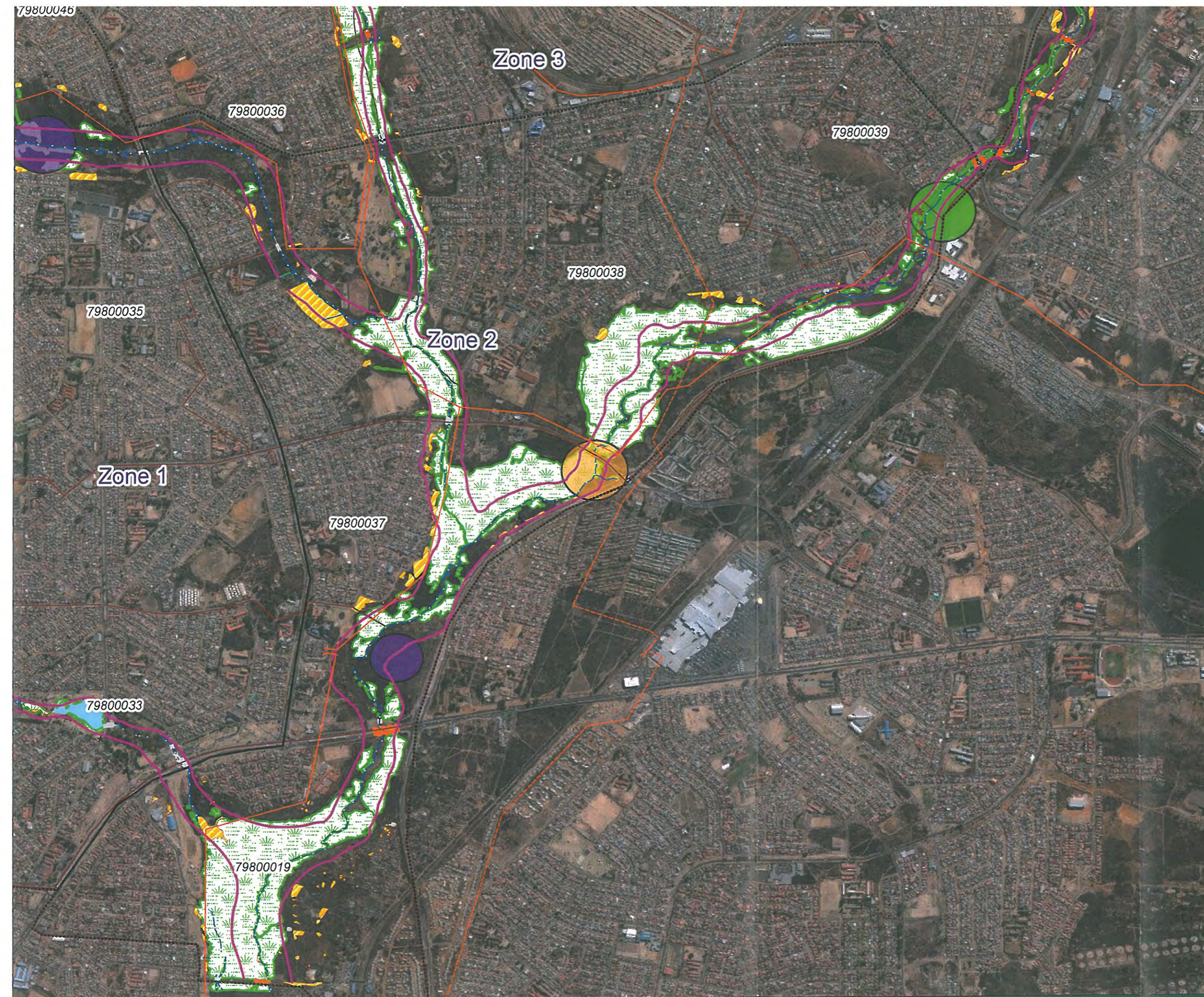
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KLIP MIDDLE SOWETO WMU



MAP OF ZONE 2 AREAS TO BE REHABILITATED



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- ★ Waypoints_21-FEB-13.gpx
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- 44-132_Power_Line
- Flow_Direction_Lines
- Retaining_Wall_Lines
- Streams_River_Lines
- 1in100years_Floodline
- Soweto_WM Zone_2
- Wards_2011
- Wiers_Areas
- Bridges_Areas
- Culverts_Areas
- Illegal_Dump_Poly_areas
- Wetlands
- Water-Body_areas

Intervention_Areas

Name

- Erosion_Control_Fences
- Gravel_Bags
- Mulching

Projection: Transverse Mercator
 Datum: WGS 1984
 Linear Unit: Meters

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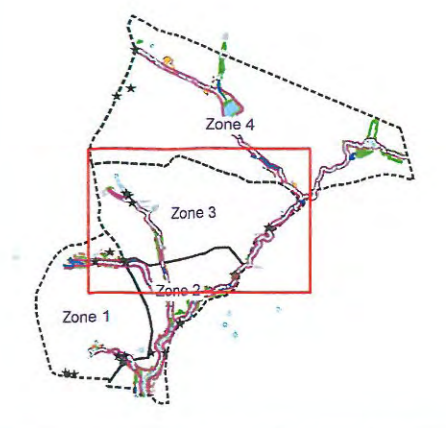
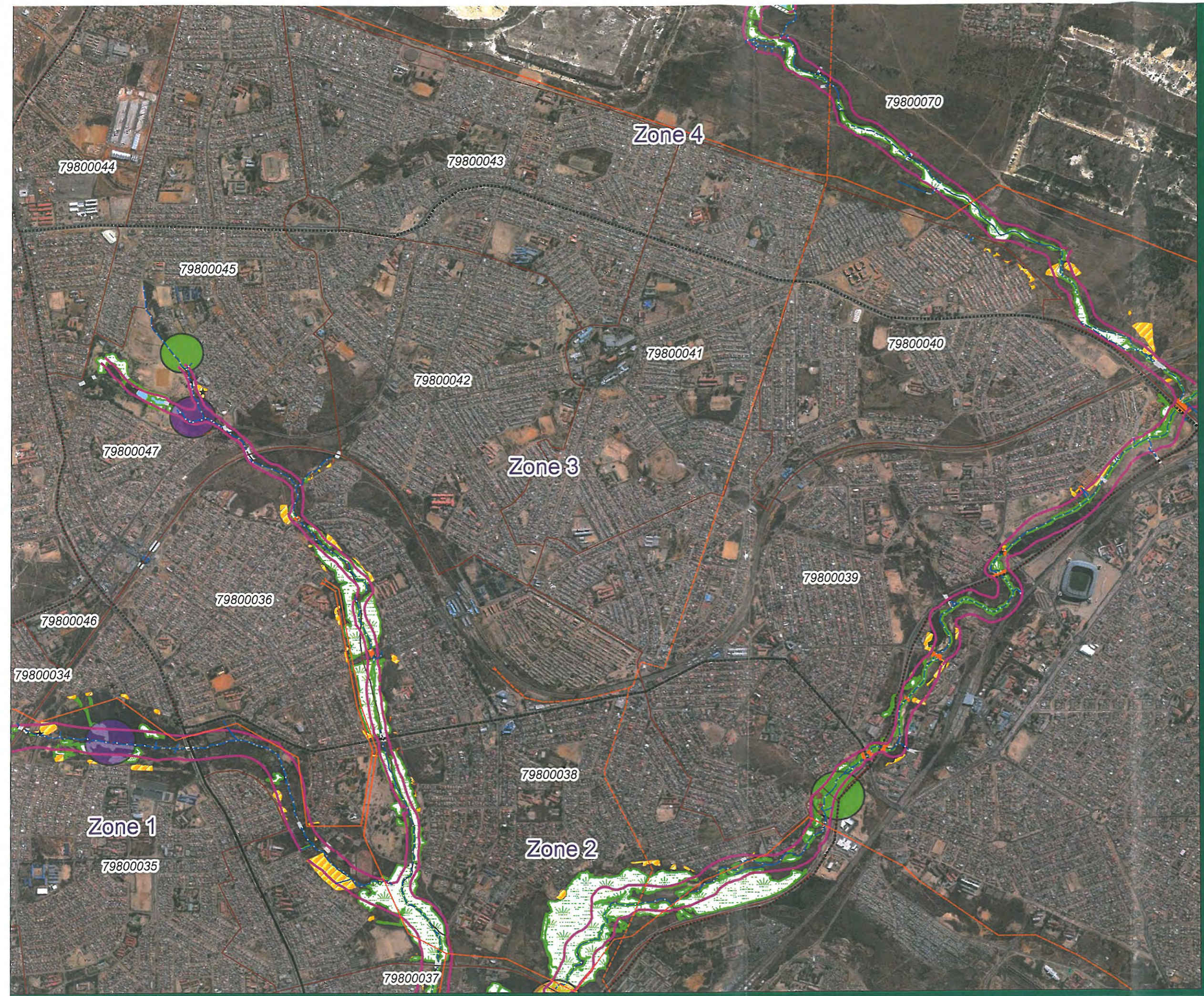
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**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES**
Environmental Stewardship

LEBONE

KLIP MIDDLE SOWETO WMU





Legend

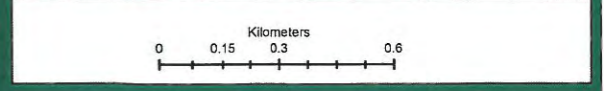
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- Water-Body_areas

Intervention_Areas

Name

- Erosion_Control_Fences
- Gravel_Bags
- Mulching

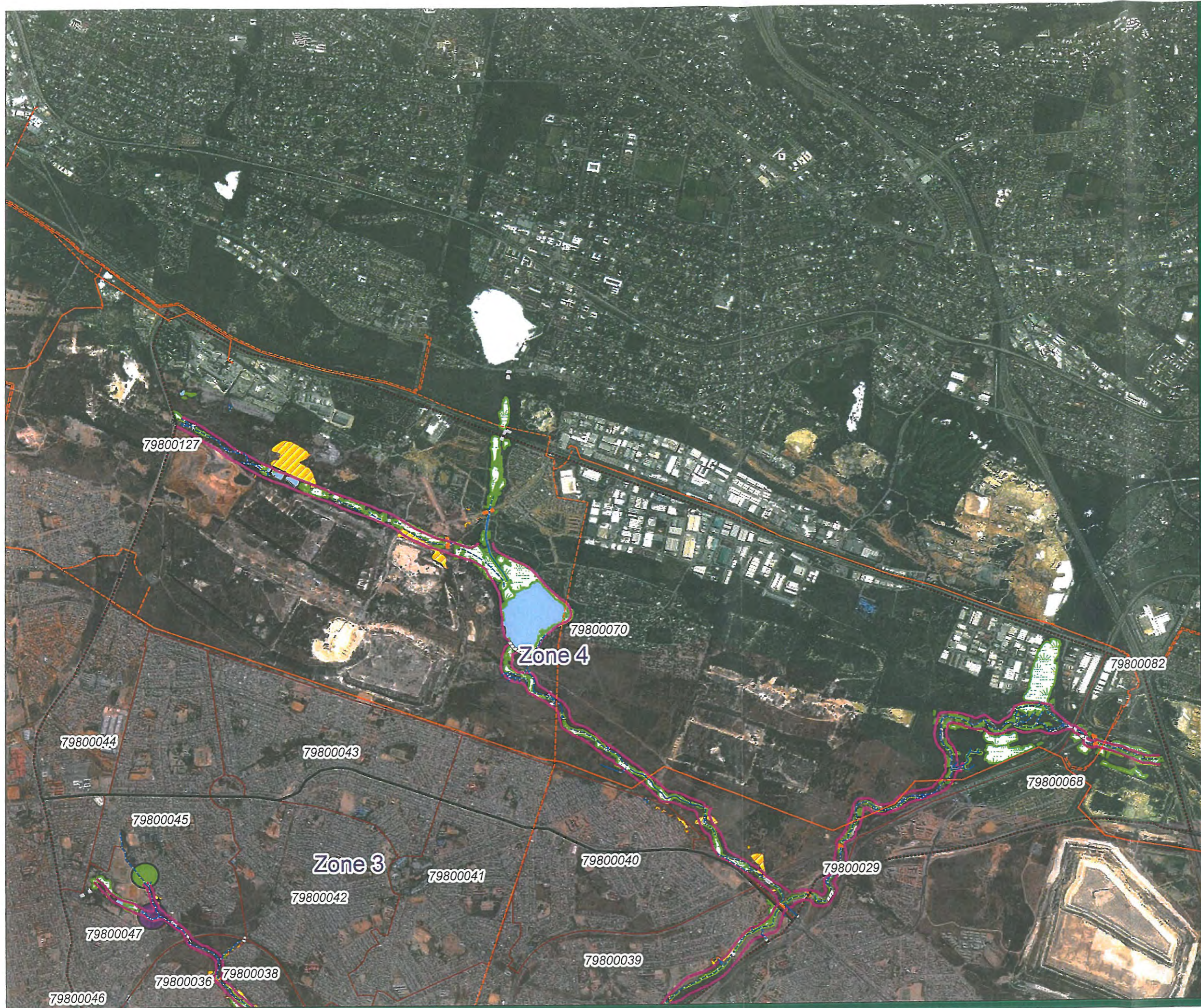
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KLIP MIDDLE SOWETO WMU



MAP OF ZONE 4 AREAS TO BE REHABILITATED



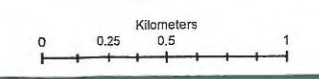
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- 1in100years_Floodline
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- Bridges_Areas
- Culverts_Areas
- Illegal_Dump_Poly_areas
- Wetlands
- Water-Body_areas

Intervention_Areas

- Name**
- Erosion_Control_Fences
 - Gravel_Bags
 - Mulching

Projection: Transverse Mercator
 Datum: WGS 1984
 Linear Unit: Meters



KLIP MIDDLE SOWETO WMU

2.4 Stakeholders Involvement during all stages of the project

Stakeholder Involvement			
Responsibility	Developer, Professional project team, Community liaison officer, Project Manager, Contractor, and ECO	Frequency/time frame	Planning and Design throughout the operation site establishment construction operations and decommissioning

Objectives

- To ensure the ongoing involvement of representatives in the planning, development and management of the rehabilitation interventions.

Mitigation Measures

- Develop and implement effective mechanisms for ongoing communications with local stakeholders and neighbouring communities.
- Actively participate in local and regional conservation and socio-economic development initiative that may affect or benefit the project during all development phases developmental stages.
- Identify and enable access to employment empowerment and capacity building opportunities for the local community.

2.5 Rehabilitation (Closure Planning and Financial Provision) for all the three (3) Alternatives

Rehabilitation			
Responsibility	Developer	Frequency/time frame	Planning and Design and throughout the operation on a quarterly basis
	Professional project team		

Objectives

- This rehabilitation plan is a general plan for all proposed three (3) Alternatives. The rehabilitation plan addresses rehabilitation of both construction and maintenance of structures during operation some appropriate instances.

Mitigation Measures:

4. Disturbed areas will be rehabilitated through topsoil replacement and the establishment of vegetation in these areas. Where practical, rehabilitation will take place during the construction and operational phases.
5. Topsoil will be conserved and used judiciously in the rehabilitation of disturbed land. Vegetation establishment in disturbed areas will be undertaken as soon as is practical, with growing season and water availability being the primary time constraints.
6. The spread of invader species on disturbed land will be controlled until the vegetation cover is capable of providing sufficient natural weed control. In general, initial revegetation will be undertaken using a mixture of indigenous available seeds that will germinate reliably (high seed viability).

Flora and Fauna Rehabilitation Plan

- Disturbance of large footprint areas will be avoided.
- Clearance activities will be limited only to the area to be used for development purposes.
- All cleared area will be rehabilitated.
- Clearance activities will be limited only to the area to be used for the sewer pipeline and associated infrastructures.
- Any tree cutting will be done in line with Municipal by-laws and a license for any cutting of a tree should be sought from the municipality (National Forest Act No 84 of 1998).
- Monitoring plan will include control of alien invasive species.

3. Description of Aspects of the Activity Covered by this Environmental Management Programme

The proposed environmental rehabilitation of the Klip Middle Soweto Water Management Unit (KWMU) for the CoJ.

Project scope

- The study area occurs in communities of Soweto which bordering along the KWMU – this WMU is roughly bounded by Koma Road on the south-west, Elias Motsoaledi on the West, Main Reef Road on the north and Klip Valley Road on the south east. some of the key suburbs within this WMU are the Soweto suburbs of Dobsonville, Meadowlands, Molapo, Jabavu, Jabulani, Zondi, Orlando West and Mofolo.
- The draught crisis recently experienced in 2015, highlighted the urgent need for the conservation of water resources to ensure access to a sustainable and reliable water resource for South Africa. The CoJ's commitment to the conservation of its sustainable resources, as also outlined in the Growth Development Strategy (GDS), will ensure that the City is doing its part to prevent further impacts on our water resources and preventing similar water shortage crisis that we are currently experiencing. In addition to this broader national challenge outlined above, the environmental aspects associated with the current high rate of development within the Johannesburg Metropolitan areas has contributed to the pollution of vulnerable WMU within CoJ and further put pressure on the already stressed water infrastructure. The expansion of urban development has

resulted in a loss of valuable riverine environment, with diversions and illegal weirs, encroachments, channelization and the construction of roads, bridges and culverts across rivers, resulting in their deterioration. In addition, the increased intensity of storm water runoff from urbanized catchments as well as increased pollutant loads is placing additional pressure on rivers which cannot always sustain such impacts. This leads to flooding, bacteriological pollution, chemical pollution, litter, exotic vegetation, bad visual impact, odour and sediment and obviously needs to be addressed.

According to the Engineering News dated 08 June 2016, The Water Resource Commission (WRC) announced that, if South African's do not start to curb their water consumption, the country will be faced with a one-billion-plus cubic-metre deficit by 2030. Their CEO, Dhesigen Naidoo, also noted that South Africans currently consumed water well above global averages (235 l/d per person compared with the global average of 177 l/d per person). (Source: Engineering News dated 8 June 2016).

- This project will address some of these pressing issues, as part of its support to the GDS goals, which advocate for management of water catchments and sources, namely, water conservation and preservation of the ecological reserve and the goal of reduced water pollution. WMUs play a role in the management of storm water as they act as receiver of storm water diverted through the storm water drains from the city streets to the water units. The wetlands within the WMU serve as a natural filtration system.

The studies will furthermore, highlight the status of the environment in the communities bordering along the Klip Middle Soweto WMU. Crucial data will be collected through specialist studies that will be conducted in the study areas as part of the Basic Environmental Assessment process.

The study entails conducting rehabilitation activities within the special identified zones. Due to the extent of the footprint of the project, the study area was broken down into 4 study zones which are depicted in the Map 1-4 as included in this document. The proposed rehabilitation activities and interventions are unique to that specific zone, in mitigation to impacts identified in those areas. Base line studies have indicated solutions that will be required to address the need for rehabilitation in the areas and identified interventions in support of the rehabilitation drive, include the following:

EROSION CONTROL

- Re-shape the river using Erosion Control Fences (Gabions), Erosion Control Fences (Box Gabions) and Erosion Control Fences (Gabions Mattresses) in the areas;
- Repair storm water outlets;
- Create dissipation / attenuation structures at storm water outlets;
- Protect / rehabilitate the riverine zone as a buffer area;
- Gravel bags, used to filter large silt particles or reduce flow velocity;

- Soil bioengineering techniques, to use of a variety of plant species without any artificial materials to control across the study areas;
- Removal of sedimentation/siltation at the river banks in such a manner that it blends with the surrounding natural area;
- Concrete weir structures to be used to address head cut and/ or channel erosion by trapping sediment and raising the local water table to encourage overland flow (i.e. rewetting a wetland)";
- Earth berms/plugs Earth berms are structures used to divert or retain water and are used to increase water levels in a wetland above historic levels to create open water; and
- Construction of flood protection berms at areas located close to the water resource.

PREVENTION OF ECOLOGICAL DEGRADATION,

- Manual and chemical eradication of Invasive alien species to be done be manually or mechanically. Methods include the use of herbicides, grazers or pathogens;
- Institute eradication and monitoring plan;
- Rehabilitate cleared areas;
- Create additional wetland habitat through off-stream wetlands; and
- Create attenuation areas, flow dissipation areas and natural waste traps.

ADRESSING ILLEGAL WASTE DUMPING

- Remove waste and dumping;
- Create flow dissipation areas and natural waste traps;
- Removing the siltation in blocked culverts;
- Regular maintenance of the culverts crossing the river system; and
- Improvement of waste collection and disposal at the communities to alleviate illegal disposal of waste.

Further interventions include the development of parks in the rehabilitated areas, to maintain the rehabilitation process. The proposed development areas of such parks are identified in Zones 1, 2, 3 and 4, as illustrated in the Zoning and Concept Map. The development process, pertaining to parks will include the construction of various types of parks that serve specific functions with in identified zones. The following:

- Create **pocket parks** in available, natural open space areas within suburban green corridors to serve local users. Due to the nature of the built environment, accessibility will most likely be semi-public. Provide low-key amenities for daily use, including small kick-about, picnic and play spaces;
- Create **community parks**. To provide amenities and facilities for daily and regular use, including sports courts, kick-about areas, picnic areas, playgrounds, events spaces and environmental education centres;
- Formalise **regional parks**. Develop regional parks to provide, large and formalised facilities that facilitate activities such as events space, sports facilities, playgrounds, features, vendor facilities, as well as, picnic areas; and
- Create **rehabilitated areas** in derelict strips between the mining edge and the river to serve community users. Accessibility must be public. Provide amenities and facilities for daily and regular urban use, including seating, vendor space and gathering space as well as signage.

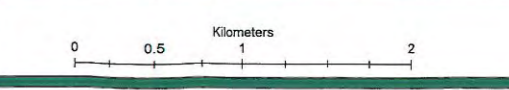
Figure 3.1- 1: Local Overview



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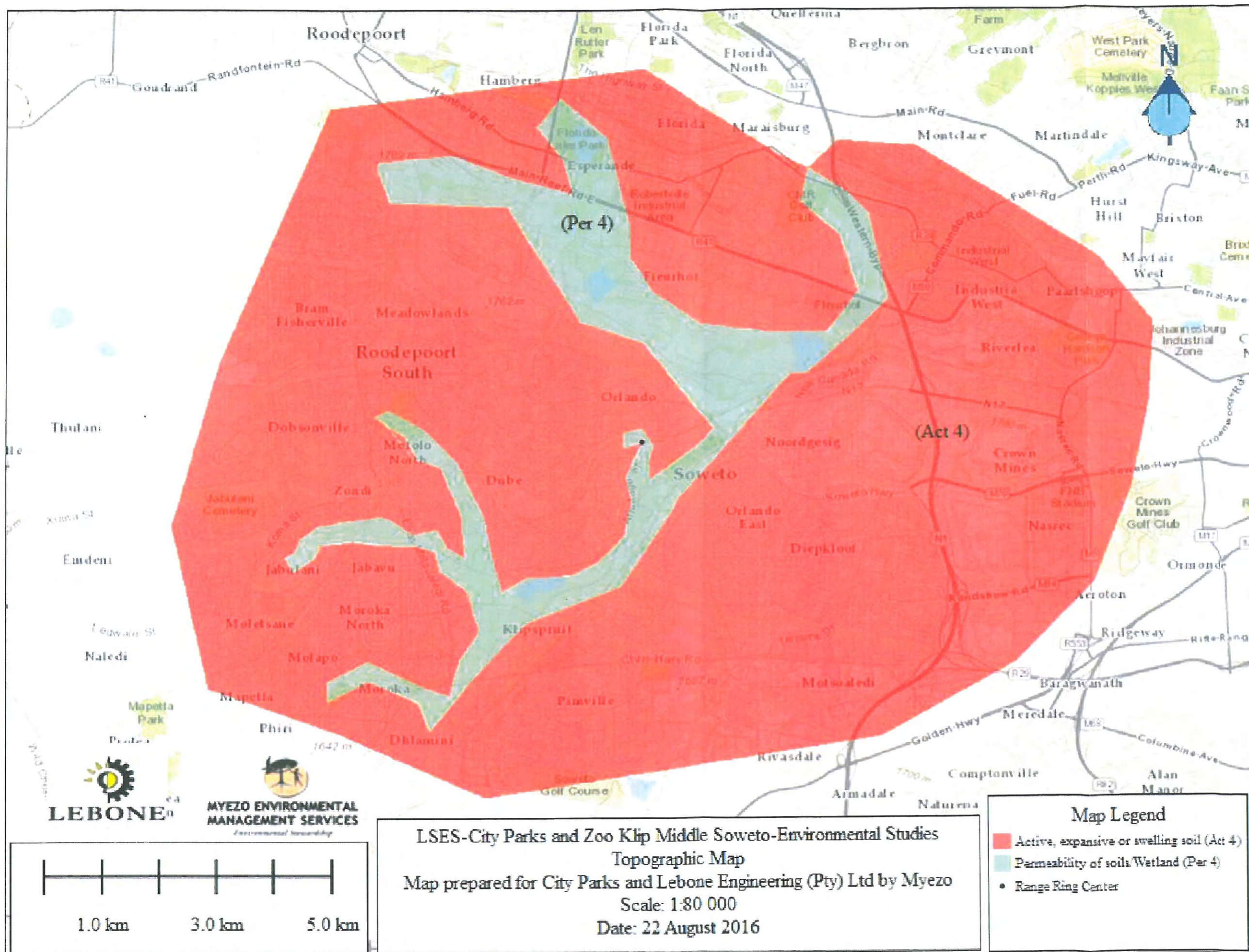
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- Intervention_Areas**
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|--------------------------|
| ▨ Erosion_Control_Fences |
| ▨ Gravel_Bags |
| ▨ Mulching |
| ▨ Wetlands |
| ▨ Water-Body_areas |
| ▨ City of Johannesb_M |

Projection: Transverse Mercator
 Datum: WGS 1984
 Linear Unit: Meters



KLIP MIDDLE SOWETO WMU

Figure 3.1- 2: Regional Overview



The activities that are expected during each of the project phases are indicated below.

3.1 Planning and Design

- ⇒ Development of drawings;
- ⇒ Construction plans;
- ⇒ Consolidation of safety files and other regulatory operational manuals;
- ⇒ Demarcate areas and zones for construction phase and operation rehabilitation activities;
- ⇒ Consultations with relevant authorities on site requirements;
- ⇒ Site clearing;
- ⇒ Demarcation of construction camp and rehabilitation areas;
- ⇒ Implement construction operations guidelines and EMPr for the Phase;
- ⇒ Recruitment of local site workers;
- ⇒ Training of site workers;
- ⇒ Safety and site management, environmental induction, wetland and rehabilitation;
- ⇒ Source PPE safety equipment;
- ⇒ Consultation with a qualified botanist on the type of plants suitable for different types of soils for each site within the identified zones.

3.2 Mobilisation and Site establishment

- ⇒ Site preparation;
- ⇒ Transporting equipment, construction materials and personnel to site;
- ⇒ Site clearing;
- ⇒ Set up mobile office facility;
- ⇒ Install storage and ablution facilities;
- ⇒ Source required human capital;
- ⇒ Install diesel storage tanks or mobile bowsers.

3.3 Construction phase

- ⇒ Putting construction signage on site;
- ⇒ Transportation of construction equipment and constructing material;
- ⇒ Heavy machinery (trucks, forklifts, dozers, loaders, competitors and concrete mixers)
- ⇒ Soil removal and stockpiling;
- ⇒ Excavations for utility trenches;
- ⇒ Construction structures;
- ⇒ GG Section E BAR;
- ⇒ Site clearance for camp construction;
- ⇒ Remove vegetation;
- ⇒ Prepare soil for construction;
- ⇒ Delivery of material, equipment and tools required;
- ⇒ Delivery of machinery for construction;
- ⇒ Materials gathering;
- ⇒ Temporal storage of materials to be used during operational phase (Mulch; seed, seedlings, topsoil, Wire etc.);

- ⇒ Mulch harvesting & Seed collection (Mulch harvesting; seed harvesting, seedlings nursery establishment);
- ⇒ Soil Stockpiling;
- ⇒ Gabion structures construction material (rocks, mesh wire, tools for tying gabions etc.);
- ⇒ Topsoil for re-vegetation (seed planting and back fill of holes or bare areas);
- ⇒ Soil erosion structures construction;
- ⇒ Earth berms;
- ⇒ Deliver and place ablution facilities on site.

3.4 Operation

Zone 1 - (Thokoza Park, Jabavu, Moroka Dam):

- ⇒ Installation of erosion control fences;
- ⇒ Stone Gabions construction and installation (gabion baskets, box gabions and gabion mattresses);
- ⇒ Installation of River mattress;
- ⇒ Sediment control using silt fence;
- ⇒ Sediment control using gravel bags;
- ⇒ Treating footpaths using organic mulch;
- ⇒ Preventing overgrazing of wetland vegetation and animal footpaths (rotational grazing);
- ⇒ Invasive alien species control;
- ⇒ Bank stabilisation using Soil bioengineering techniques (establishing a dense cover of soil protecting plants);
- ⇒ Addressing illegal dumping through river clean ups (clearing of debris in water, clearing of blocked culverts and more);
- ⇒ Dumping of yard waste into the seasonal zone of a wetland;
- ⇒ Preventing unsustainable reed harvesting;
- ⇒ Soil and ground movement during rehabilitation activities in stream areas;
- ⇒ Clearing of silt on the river banks and inlet to wetland;
- ⇒ Installation of fencing and gates for access control;
- ⇒ Erosion Control;
- ⇒ Storm Water and Flood Management;
- ⇒ Construction of Berms Storm Water Structures;
- ⇒ Deterioration of water quality;
- ⇒ Disposal of domestic solid waste and building rubbles.

Zone 2 - (Orlando West Park section to Kliptown):

- ⇒ Mulching of slopes and banks (Stabilisation of slopes using geotextile; seeding slopes to get them ready for mulching; Harvesting of trees for mulching, Layering slopes with mulch);
- ⇒ Installation of erosion control fences;
- ⇒ Stone Gabions construction and installation (gabion baskets, box gabions and gabion mattresses);
- ⇒ Installation of River mattress;
- ⇒ Sediment control using silt fence;
- ⇒ Sediment control using gravel bags;

- ⇒ Treating footpaths using organic mulch;
- ⇒ Invasive alien species control;
- ⇒ Bank stabilisation using Soil bioengineering techniques (establishing a dense cover of soil protecting plants);
- ⇒ Addressing illegal dumping through river clean ups (clearing of debris in water, clearing of blocked culverts and more);
- ⇒ Dumping of yard waste into the seasonal zone of a wetland;
- ⇒ Preventing unsustainable reed harvesting??;
- ⇒ Soil and ground movement during rehabilitation activities in stream areas;
- ⇒ Clearing of silt on the river banks and inlet to wetland;
- ⇒ Installation of fencing and gates for access control;
- ⇒ Erosion control;
- ⇒ Storm Water and Flood Management;
- ⇒ Construction of Berms Storm Water Structures;
- ⇒ Deterioration of water quality;
- ⇒ Disposal of domestic solid waste and building rubbles.

Zone 3 - (Dorothy Nyembe Park):

- ⇒ Installation of erosion control fences;
- ⇒ Stone Gabions construction and installation (gabion mattresses);
- ⇒ Installation of River mattress;
- ⇒ Sediment control using gravel bags;
- ⇒ Treating footpaths using organic mulch;
- ⇒ Invasive alien species control;
- ⇒ Bank stabilisation using Soil bioengineering techniques (establishing a dense cover of soil protecting plants);
- ⇒ Addressing illegal dumping through river clean ups (clearing of debris in water, clearing of blocked culverts and more);
- ⇒ Dumping of yard waste into the seasonal zone of a wetland;
- ⇒ Preventing unsustainable reed harvesting ??;
- ⇒ Soil and ground movement during rehabilitation activities in stream areas;
- ⇒ Clearing of silt on the river banks and inlet to wetland;
- ⇒ Installation of fencing and gates for access control;
- ⇒ Erosion Control;
- ⇒ Storm Water and Flood Management;
- ⇒ Construction of berms storm water structures;
- ⇒ Deterioration of water quality;
- ⇒ Disposal of domestic solid waste and building rubbles.

Zone 4 - (Fleurhof Dam):

- ⇒ Installation of erosion control fences;
- ⇒ Stone Gabions construction and installation (gabion baskets, box gabions and gabion

- mattresses);
- ⇒ Installation of river mattress;
- ⇒ Sediment control using silt fence;
- ⇒ Sediment control using gravel bags;
- ⇒ Treating footpaths using organic mulch;
- ⇒ Preventing overgrazing of wetland vegetation and animal footpaths (rotational grazing);
- ⇒ Invasive alien species control;
- ⇒ Bank stabilisation using soil bioengineering techniques (establishing a dense cover of soil protecting plants);
- ⇒ Addressing illegal dumping through river clean ups (clearing of debris in water, clearing of blocked culverts and more);
- ⇒ Dumping of yard waste into the seasonal zone of a wetland;
- ⇒ Preventing unsustainable reed harvesting;
- ⇒ Soil and ground movement during rehabilitation activities in stream areas;
- ⇒ Clearing of silt on the river banks and inlet to wetland;
- ⇒ Installation of fencing and gates for access control;
- ⇒ Erosion control;
- ⇒ Storm water and flood management;
- ⇒ Construction of berms storm water structures;
- ⇒ Deterioration of water quality;
- ⇒ Disposal of domestic solid waste and building rubbles;
- ⇒ Determine status of water use for the construction of residential developments within Fleurhof and apply for water use licence (if required);
- ⇒ Development of a park and walkways;
- ⇒ Construction of additional recreational facilities for the Fleurhof Dam such as restaurant or retail centre, jetty, boardwalk etc.

3.5 Site Closure

- ⇒ Cleaning of the site;
- ⇒ Removal of redundant materials and debris;
- ⇒ Removal of redundant machinery;
- ⇒ Ensuring proper project hand-over.

4. Roles and Responsibilities

The Professional Project Team is responsible for ensuring that all the EMP requirements are implemented. He/she may appoint a person who will assist in conducting monitoring audits during construction. The appointment will be in writing and the environmental responsibilities will be included in the key performance areas of the appointed personnel.

Roles and Responsibilities			
Responsibility	Developer, Professional project team, Principal contractor, ECO and OHS Officer, SHE Officer, Sub-contractors and Community liaison officer	Frequency/time frame	Until closure

Objectives

To ensure that:

- There is allocation of sufficient personnel and other resources to meet objectives and targets.
- Environmental Management System (EMS) procedures to stipulate equipment requirements and personnel requirements to ensure that there is clearly defined roles and responsibilities.
- Compliance roles and responsibilities of environmental protection personnel to be clearly defined and incorporated into key performance areas as a comprehensive part of the performance management system.
- Accountability for achieving and maintaining compliance is set through formal appointments for any delegated environmental roles.

The EMPr specifies the minimum requirements to be implemented by the developer according to the scope of work and the scope of the environmental authorisation. This is done to reduce and manage the potential environmental impacts for sustainable environmental management practices. A guide for environmental monitoring throughout the construction and operational phases is provided. The EMPr is binding to any party which responsibility for the construction activities has been delegated to, until such time that the competent authority has been formally released the developer from its responsibilities in terms of this EMPr.

It is essential that the EMPr requirements be carefully studied, understood, implemented, and adhered to at all time. To simplify that the EMPr requirements, each aspect related to the EMPr, which needs to be independently addressed outside its associated activities has been addressed in the table below. Each action linked to the priority of when the specific action will be implemented.

4.1 Environmental Training and Awareness

It is important to ensure that the contractor has the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental harm. Training needs should be identified based on the available and existing capacity of site personnel (including the contractors and sub-contractors) to undertake the required EMPr management actions and

monitoring activities. It is vital that all personnel are adequately trained to perform their designated tasks to an acceptable standard.

Training will be done in a verbal format. The training will be a once-off event; however, the contractor should make provision for weekly training or Toolbox Talks. In addition to training, general environmental awareness must be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. This ensures that environmental accidents are minimised and environmental compliance maximized.

The environmental training is aimed at:

- Promoting environmental awareness;
- Informing the contractor of all environmental procedures, policies and programmes applicable;
- Providing generic training on the implementation of environmental management specifications; and
- Providing job-specific environmental training in order to understand the key environmental features of the construction site and the surrounding environment.

5. Environmental Measures, Actions and Controls

This section indicates the actions required to either prevent and/or minimize the potential impacts on the environment that is associated with the project.

5.1 Responsibility

This section indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr.

5.2 Monitoring Frequency and time frames

This section also indicates when the actions for that specific aspect must be implemented and/or monitored.

5.3 Mitigation measures

The management measures will be implemented during the duration of the construction and operation of the site until closure as presented under Section 2.

Table 5.3-1: Responsibility and Timeframes for Implementing each of the Mitigation Measures

Environmental Element Affected	Responsibility	Time Frames and Phases of Implementation
1.Topography	Professional project team, Principal Contractor, ECO and OHS Officer, SHE Officer, and Sub-Contractors and Suppliers	Construction, Operation and Decommissioning
2.Soils (Pollution) and/or Erosion	Professional project team, Principal Contractor, ECO and OHS Officer, SHE Officer, and Sub-Contractors and Suppliers	Ongoing
4.Land Capability and Land Use	Professional project team, Principal Contractor, and Sub-Contractors and Suppliers	Operation, Decommissioning
5.Ecology	Professional project team, Principal Contractor, ECO and OHS Officer, SHE Officer, and Sub-Contractors and Suppliers	Construction, Operation, Decommissioning
6.Surface water	Professional project team, Principal Contractor, and Sub-Contractors and Suppliers	Ongoing
7.Ground water	Professional project team, Principal Contractor, and Sub-Contractors and Suppliers	Ongoing
8.Air Quality	Professional project team, Principal Contractor, and Sub-Contractors and Suppliers	Ongoing
9.Noise	Developer, Professional project team, Principal Contractor, and Sub-Contractors and Suppliers	Ongoing
10.Visual	Developer, Professional project team, Principal Contractor, and Sub-Contractors and Suppliers	Operation and Decommissioning
11.Archaeology	Professional project team, Principal Contractor, and Sub-Contractors and Suppliers	Ongoing
12.Socio-economic	Developer, Professional project team, Principal Contractor, and Sub-Contractors and Suppliers and Community Liaison Officer	Ongoing

5.4 Budget

Operational Budget will be used to implement all EMP commitments

6. Performance Monitoring and Reporting

Performance Monitoring and Reporting			
Responsibility	COJ City parks and Zoos	Frequency/time frame	Until closure

6.1 Environmental Auditor

An internal Environmental Auditor (EA) shall be appointed by CoJ. The EA shall be commissioned to undertake an environmental audit on a yearly basis into perpetuity (or for as long as the site is used as a picnic-braai site). The yearly audits shall include:

- Undertaking site inspections to determine whether compliance with this operational EMP;
- Compilation of annual audit reports;
- Identifying areas of non-compliance, and recommending measures to rectify these in consultation with the Local Authority.

CoJ will conduct internal audits to check compliance of project activities with the approved EMP. The site will be visited and any non-compliance will be addressed through development of corrective actions. The corrective actions will be assigned to responsible personnel who will then implement them. EMP performance will be part of weekly project meetings.

All site personnel will be given a copy of the management measures committed to in this EMP, to keep with them during the duration of the construction activities. Internal audits will be conducted on a weekly and monthly basis to check compliance with the approved EMP. During the internal audits, the site will be visited and any non-compliance identified will be addressed through development of corrective actions. The corrective actions will be assigned to site safety representative on site, who will then implement them. The project/site engineer will follow-up on the corrective actions on a weekly basis and sign them off once satisfied that they have been implemented.

In addition to the above mentioned performance and monitoring commitments, CoJ shall adopt the following strategies to ensure that the commitments stipulated in this EMP are adhered to:

1. Develop a procedure for ensuring that the company identifies and allocates human, technical and financial resources necessary to meet its environmental objectives and targets;
2. Review EMS procedures and ensure that human resources are allocated to set environmental management objectives;
3. Define roles and responsibilities and link these two key performance areas to ensure that key performance areas of identified environmental responsible personnel to include environmental

obligations;

4. Review complaints registers or other procedures to ensure that concerns concerning environmental performance and compliance raised by personnel are received and addressed;
5. Update environmental awareness plan annually and implement;
6. Focus training on means on enhancing ability of personnel to ensure compliance with environmental requirements;
7. Conduct environmental inductions for contractors and subcontractors;
8. Conduct environmental inductions for employees;

In addition, the following initiatives will be adhered to:

- New opportunities to be communicated to relevant affected parties through an agreed formal communication channel and concerns to be incorporated into feasibility decisions;
- Complaints registers to be utilised and reviewed and corrective actions done;
- Interested and affected parties (IAPs) concern to be incorporated into project implementation;
- Internal communication to be strengthened to support continual improvement.

6.2 Monitoring Plan

The monitoring programme to be implemented while rehabilitation is being undertaken will involve:

- Annual environmental audits to be undertaken by an independent EA to ensure that the operational EMP is being adhered to;
- Completion by the EA of annual audit reports which will be submitted to the GDARD.

The Monitoring Plan is presented in Table 6.2-1.

Table 6.2-1: Monitoring Plan

Action	Frequency	Method	Period
1. Monitor Stability	Monthly and following any heavy rainfall.	Record foot or vehicle patrol.	Until closure
2. Monitoring of re-vegetation on rehabilitated areas Check progress with vegetation covered and provide remedial action if not successful	Every 6 months	<ul style="list-style-type: none"> • Map all rehabilitated areas. • Determine extent of the treated areas. • Foot inspection. • Photographs every two weeks for the first month and thereafter every month. • Keep photographs with detailed record of vegetation establishment. 	Until closure
3. Monitoring of erosion Pumps and pipelines All cleared areas	Every 6 months and following any heavy rainfall	Visual inspection Walk over landscaped areas. Record and Photograph.	Until closure.
4. Monitor access roads to the facilities	Monthly	Constant clearing and paving and ensure adequate storm water control.	Until closure
5. Monitoring of stability of the storm water settlement ponds and drainage and diversion canals	Monthly and summarise every 3 months	Visual inspections.	Until closure

6.3 Reporting Procedures

Documentation

The following documentation must be kept on site in order to record compliance with the EMP:

- An environmental file which includes:
- Copy of the EMP;
- Copy of the Environmental Authorisation;
- Copy of all other licences/permits;
- Copy of all rehabilitation plans;

- Copy of the rehabilitation interventions
- Copy of relevant legislation;
- Environmental Policy of the main contractor;
- Environmental method statements compiled by the contractor;
- Non-conformance reports;
- Environmental register, which shall include:
 - Communications Register—including records of complaints, and, minutes and attendance registers of all environmental meetings;
 - Monitoring Results – including environmental monitoring reports, register of audits, Non-Conformance Reports (NCR);
 - Incident book – including copies of notification of Emergencies and Incidents, this must be accompanied by a photographic record
 - Waste manifests.

- Waste Documentation such as Sewerage Disposal Receipts;
- Material Safety Data Sheets for all hazardous substances;
- Dust suppression register;
- Water Quality Monitoring reports (if necessary);
- Written Corrective Action Instructions; and
- Notification of Emergencies and Incidents.

Environmental Register

The developer will put in place an environmental register. The contractor will ensure that the following information is recorded for all complaints/incidents:

- Nature of complaint/incident;
- Causes of complaint/incident;
- Party/parties responsible for causing complaint/incident;
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident;
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident;
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented;
- Copies of all correspondence received regarding complaints/incidents.

The above records will form an integral part of the contractors' records. These records will be kept with the EMPr, and will be made available for scrutiny if so requested by the developer.

Non-Conformance Report

A Non-Conformance Report (NCR) will be issued to the contractor as a final step towards rectifying a failure in complying with a requirement of the EMPr. This will be issued by the ECO to the contractor in writing. Preceding the issuing of an NCR, the contractor must be given an opportunity to rectify the issue.

Should the ECO assess an incident or issue and find it to be significant (e.g. non-repairable damage to the environment), it will be reported to the relevant authorities and immediately escalated to the level of a NCR.

The following information should be recorded in the NCR:

- Details of non-conformance;

- Any plant or equipment involved;
- Any chemicals or hazardous substances involved;
- Work procedures not followed;
- Any other physical aspects.
- Nature of the risk.
- Actions agreed to by all parties following consultation to adequately address the non-conformance in terms of specific control measures and should take the hierarchy of controls into account.
- Agreed timeframe by which the actions documented in the NCR must be carried out.
- ECO should verify that the agreed actions have taken place by the agreed completion date, when completed satisfactorily; the ECO and contractor should sign the close-out portion of the Non-Conformance Form (NCF) and file it with the contract documentation.

Environmental Emergency Response

The contractor's environmental emergency procedures must ensure appropriate responses to unexpected/accidental actions/incidents that could cause environmental impacts. Such incidents may include:

- Accidental discharges to water (i.e. into the watercourse) and land;
- Accidental spillage of hazardous substances (typically oil, petrol, and diesel);
- Accidental toxic emissions into the air; and
- Specific environmental and ecosystem effects from accidental releases or incidents.

The Environmental Emergency Response Plan (EERP) is separate to the Health and Safety Plan as it is aimed at responding specifically to environmental incidents and must ensure and include the following:

- Construction employees shall be adequately trained in terms of incidents and emergency situations;
- Details of the organisation (i.e. manpower) and responsibilities, accountability and liability of personnel;
- A list of key personnel and contact numbers;
- Details of emergency services (e.g. the fire department / on-site fire detail, spill clean-up services) shall be listed;
- Internal and external communication plans, including prescribed reporting procedures;
- Actions to be taken in the event of different types of emergencies;
- Incident recording, progress reporting and remediation measures to be implemented; and
- Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.

The contractor and their sub-contractor(s) must comply with the environmental emergency preparedness and incident and accident-reporting requirements as per the relevant legal requirements.

Method Statements

It is a statutory requirement to ensure the wellbeing of employees and the environment. To allow the mitigation measures in this document to be implemented, task-specific method statements should be developed for each set of tasks.

A method statement details how and when a process will be carried out, detailing possible dangers/risks, and the methods of control required.

- Type of construction activity;
- Timing and location of the activity;
- Construction procedures;
- Materials and equipment to be used;
- Transportation of the equipment to/from site;
- How equipment/material will be moved while on site;
- Location and extent of construction site office and storage areas;
- Identification of impacts that might result from the construction activity;
- Methodology and/or specifications for impact prevention/containment;
- Methodology for environmental monitoring;
- Emergency/disaster incident and reaction procedures (required to be demonstrated); and
- Rehabilitation procedures and continued maintenance of the impacted environment.

The contractor will be accountable for all actions taken in non-compliance of the approved method statements. The contractor shall keep all the method statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation.

As a minimum the following method statements will be required to be generated:

- Bunding;
- Blasting;
- Construction site and office/yard establishment;
- Cement mixing / concrete batching/bentonite mixing;
- Contaminated water;

- Dust;
- Environmental awareness course(s);
- Environmental monitoring;
- Erosion control;
- Fire, hazardous and/or poisonous substances;
- Fuels and fuel spills (may form part of the item above);
- Storage, handling and decanting of diesel (may form part of the item above);
- Personnel, public and animal safety;
- Rehabilitation of modified environment(s);
- Solid and liquid waste management;
- Sources of materials (including MSDSs);
- Top-soil management; and
- Wash areas.

Public Communication and Liaison with I&APs

The developer will ensure that the adjacent landowners are informed and updated throughout the development phases.

Sufficient signage should be erected around the site (including at the entrance), informing the public of the construction activities taking place. The signboards should include the following information:

- The name of the contractor.
- The name and contact details of the site representative to be contacted in the event of emergencies or complaint registration.

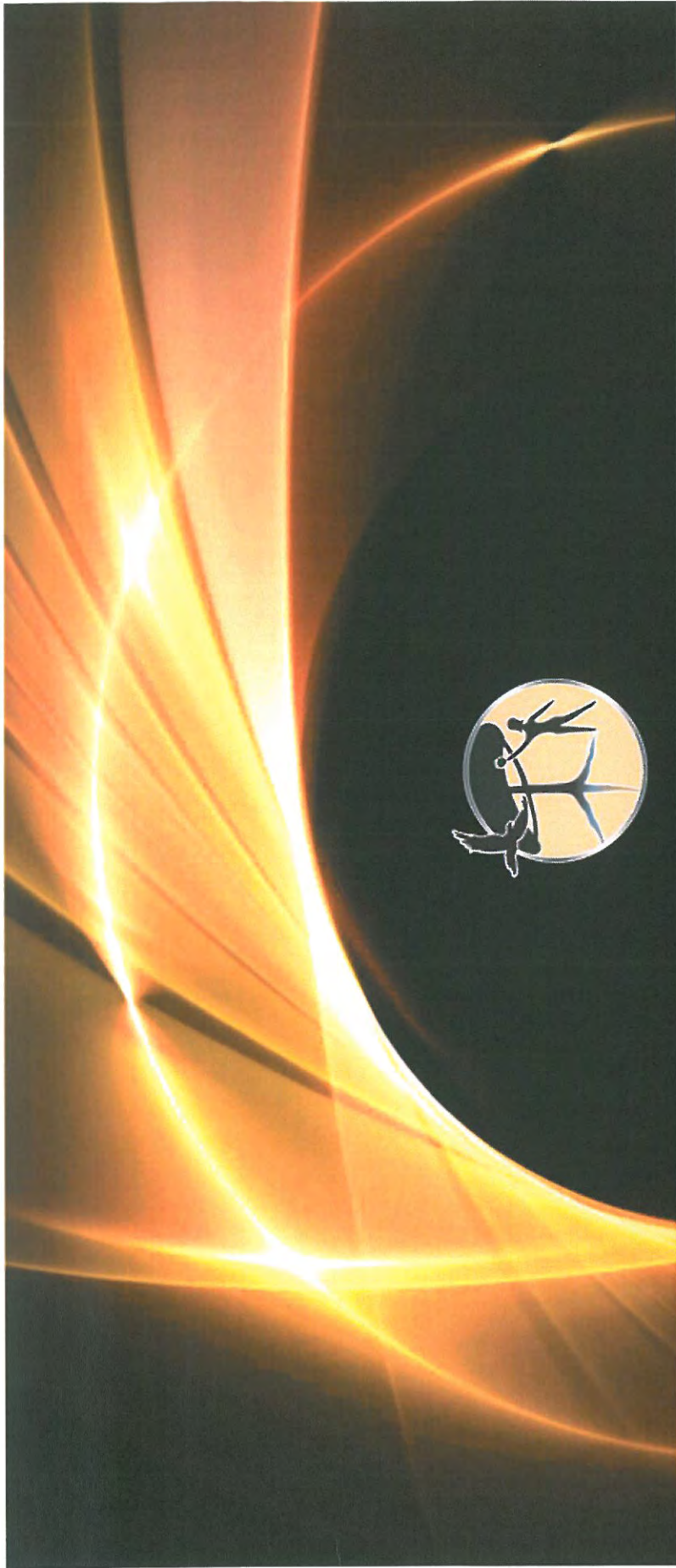
- Annexure 1: Company Profile



MYEZO ENVIRONMENTAL MANAGEMENT SERVICES

Environmental Stewardship

COMPANY PROFILE





MYEZO ENVIRONMENTAL MANAGEMENT SERVICES [Pty] Ltd

Environmental Stewardship



Environmental impact assessments | Management programme reports | Management system | Water use licences | Waste management plans | Public involvement | Env workshops | Env auditing

Company Profile



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship

*An Environmental Consulting Company that Provides a range of
Environmental Services cutting across various sectors,
Specialising in Mining.*

Value Added Services

We offer our clients a pool of environmental expertise to meet their authorisation, implementation and monitoring needs.

- Environmental impact assessments
- Environmental management programme reports including development/implementation of environmental management plans
- Environmental management system
- Water use licences
- Integrated waste management plans
- Public involvement (*liaisons with stakeholders regulatory authorities*)
- Environmental workshops
- Environmental auditing



Business Excellence Model – CARE

Our values are our critical assets and we are committed to upholding them. Myezo Environmental Management Services is built on key values that embody what we term as CARE. Upholding these qualities have helped the business develop and prosper into the environmental management services company, it is today and has sustained return clientele, including JSE listed companies and those who had been voted amongst the top 100 companies.

EXECUTE TO EXCEL

- Be professional, reliable and trustworthy
- Operate with dignity and honour



ACCOUNTABILITY & RESPONSIBILITY

- Take responsibility for our work and be accountable for the decisions we take



RESPECT & HONOUR

- Love nature
- Love our fellow human beings
- Nurture our team to realise their full potential
- Support and care for each other as a team

COMMITMENT & COMMUNICATION

- Continual improvement
- Communicate and serve to exceed expectations
- Listen, provide reliable diagnosis and solutions to clients challenges



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES**
Environmental Stewardship

Company Mission



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship

- To provide wise environmental solutions which promote responsible environmental stewardship as well as upliftment of social, economic and ecological sanity.

Unique Success Proposition

- Peace of mind through mutual win-win implementable environmental solutions.
- Openly engage, empower and facilitate stakeholder engagements designed to achieve integrated environmental solutions and transparent governance.
- Good quality reports with jointly tested and assessed alternative solutions that not only comply with your project regulatory requirements but are tailored to promote easy implementation, monitoring and continuous improvement.
- Environmental solutions which optimise environmental resource use and promote your environmental stewardship.



Service Excellence



MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd
Environmental Stewardship

Our Service Excellence Guarantee

- We guarantee 100% legal compliance.
- We guarantee delivery by mutually agreed project phases.
- Guaranteed delivery on mutually agreed target timelines provided all stakeholders deliver at specified time periods or 1% discount on the overall cost of each project phase that we do not deliver at agreed time frame.



Benefits of Working with Myezo

- You will make a difference in your bottom line by avoiding unnecessary environmental authorisation delays and excessive costs.
- You will comply with regulatory requirements.
- You will be in control of your business by integrating implementation and monitoring of your environmental solutions into your existing business systems.
- You will continuously improve on your environmental performance and be an admired environmental steward.

Environmental Unit



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship

Environmental Management Unit

- Basic Assessments;
- Scoping and Environmental Impact Assessments;
- Mining and Prospecting Right Applications;
- Environmental Impact Assessments;
- Environmental Management Programmes;
- Water Use Licence Applications;
- Air Pollution Certificates;
- Amendment of Environmental Management Programmes;
- Performance Assessments and Audits in terms of NEMA and MPRDA.



Water Engineering Unit



MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd
Environmental Stewardship



Water Engineering Unit

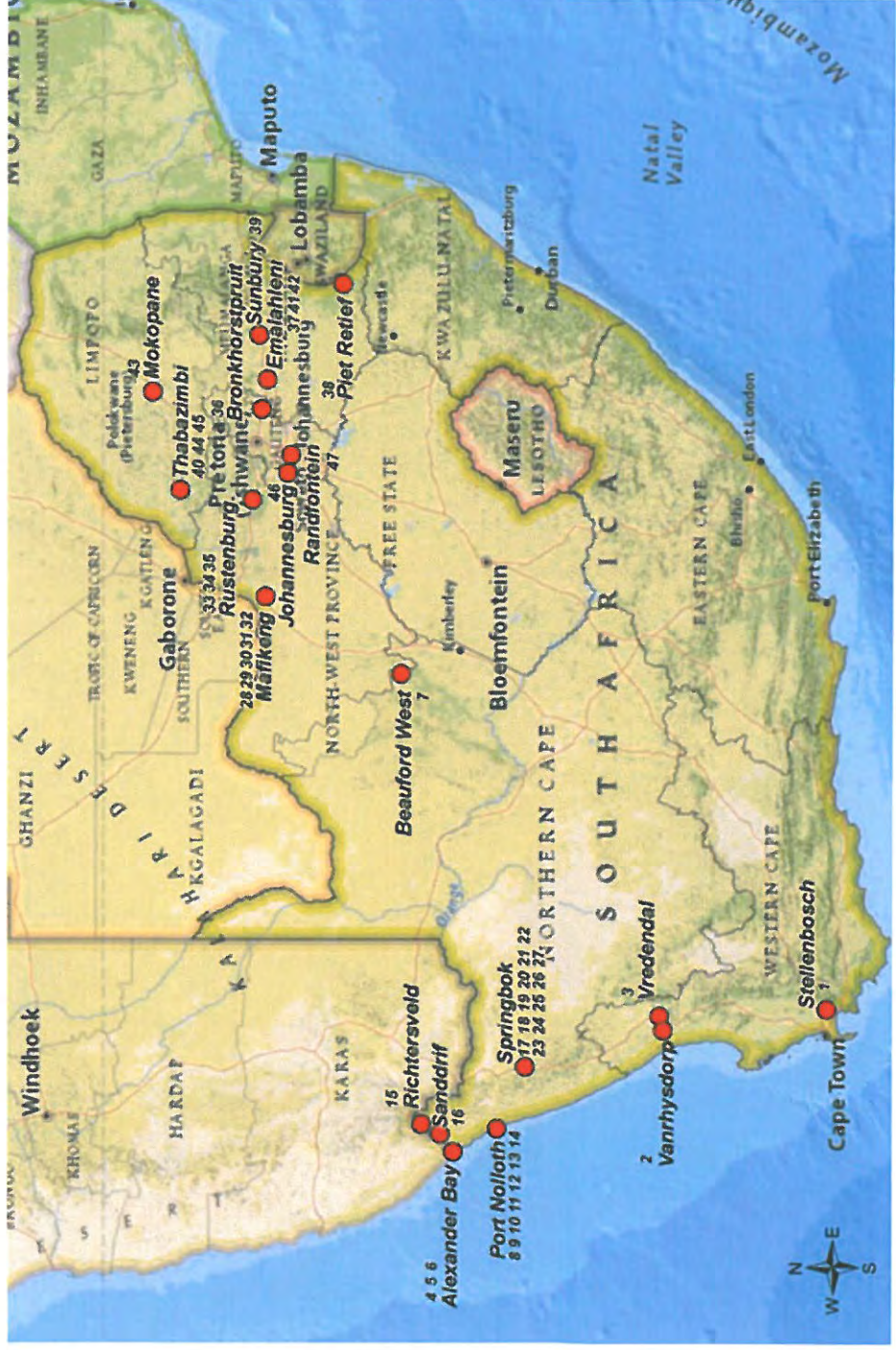
- Water Resource Management Studies;
- Storm Water Management;
- Applicability of Best Practice Guidelines ;
- Water Use Licensing;
- Flood line Delineation;
- Water Balance Studies;
- Water Quality Management (Including monitoring);
- GIS applications;
- Water Pollution Prevention Methods;
- Minimization of water retention on rehabilitated lands;
- Effective clean and dirty water separation; and
- Containment of polluted water.

Geographical Representation



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship

Projects Undertaken by Myezo – Regional/Local Setting



Project Experience & Track Record



**MYZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship



Project Experience and Track Record



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship

- We have successfully partnered with other businesses before and some of the projects we have successfully undertaken together are provided below.
- You are more than welcome to chat to our clients for a reference and we will supply you with the contact details for any of our projects listed below on request.



Project Experience



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES (Pty) Ltd**
Environmental Stewardship

Environmental Auditing

- **Trans Hex Operations (Pty) Ltd:** Lead auditor for annual external audits undertaken for Trans Hex's mining operations – Baken mine, Bloedriff Mine and Reuning Mine, Northern Cape (2005, 2006, 2007, 2008).
- **Trans Hex Operations (Pty) Ltd:** Annual and two yearly external monitoring and performance assessment audits and annual financial provision revision for Sea Concession 11(a) and 12(a) and 13 (a), Northern Cape 2005–2011 (in progress).
- **Trans Hex Operation (Pty) Ltd:** Development of environmental management plans and environmental performance audits for marine and land operations (2005–2012 (on going)).
- **Double Ring Mineral Resources (Pty) Ltd:** Performance Assessment for prospecting activities on Farm Goedehoop 196 HT, Piet Retief in Mpumalanga Province (2012).
- **Enermin Africa (Pty) Ltd:** Performance Assessment for Enermin Africa (Pty) Ltd prospecting activities on Farm Molopo Ratshidi 302, within the Mafikeng Local Municipality, North West Province (2013).
- **Alexkor Ltd:** Performance assessment report for the prospecting activities undertaken over Sea Concession 1(c), within the Administrative District of Namaqualand, Northern Cape (2013).

Project Experience cont



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES (Pty) Ltd**
Environmental Stewardship

Environmental Management Programmes, including the post-mining land use and rehabilitation plans, in terms of the Mineral & Petroleum Resources Development Act 2002 (Act No.28 of 2002)

- **Athi River Mining South Africa (Pty) Ltd:** Environmental Management Programme is support of a mining right in terms of Section 39 and of Regulation 50 and 51 of Mineral and Petroleum Resource Development Act, 2002 (Act No.28 of 2002), Mahikeng, North West Province. (2012-2013).
- **Enermin Africa (Pty) Ltd:** Environmental Management Programme in support of a mining right in terms of Section 39 and of Regulation 50 and 51 of Mineral and Petroleum Resource Development Act, 2002 (Act No.28 of 2002), including post-mining land use and spatial consideration inputs, Mahikeng, North West Province. (2012-2013).

Project Experience cont



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES (Pty) Ltd**
Environmental Stewardship

Country Reports, Sustainability Reports and Closure Plans

- **Department of environmental Affairs and Tourism: Fourth Country Report for United Nations Convention to Combat Desertification (2008).**
- **Wesizwe: Development of sustainability framework including policies and guidelines (2008–2009).**
- **Etruscan Resources Inc: Environmental management in support of a mining right application (2008).**
- **Trans Hex Operations (Pty) Ltd: Closure plans and associated performances assessment audits and financial provision calculations for prospecting farms (2009–2013).**
- **Unimining Joint Venture: Implementation of environmental measures during rehabilitation of an asbestos Mine – Heningvlei (2006–2007).**
- **The then Department of Minerals and Energy–Council for Scientific and Industrial Research Project for abandoned Mines: Myezo subcontracted by CSIR for development of Environmental Best Practice guidelines for Granite Mines in the North –West Province (2005).**

Project Experience cont



MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES (Pty) Ltd
Environmental Stewardship

Country Reports, Sustainability Reports and Closure Plans cont...

- **Alexkor SOC Ltd:** Development of a Five Year Implementation Land Rehabilitation Plan at Alexandre Bay Mine, in Northern Cape (2013–2015).
- **Trans Hex Operations (Pty) Ltd:** Application for Closure Certificates in terms of Section 43 (4) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), were prepared for various prospecting activities undertaken farms in Northern Cape (10 Closure Plans were prepared) (2009).
- **Trans Hex Operations (Pty) Ltd:** Application for Closure Certificates in terms of Section 43 (4) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), were prepared for various prospecting activities undertaken in North West by Trans Hex. (23 Application for Closure Plans were prepared) (2009).

Project Experience cont



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship

Environmental Impact Assessments and Plans in terms of National Environmental Management Act 1998 (Act No. 107 of 1998)

- **Athi River Mining South Africa (Pty) Ltd:** Environmental impact assessment in terms of National Environmental Management Act 1998 (Act 107 of 1998) for a proposed Mafikeng Cement Project and associated activities, including quarry within Ngaka Modiri Molema district Municipality (2010–2011).
- **The GHAAP Abattoir Ostrich (Pty) Ltd (GHAAP):** Funded by Sishen Iron Ore Company Community. Development Trust (SIOC–CDT), Environmental impact assessment / basic assessment for a proposed abattoir and deboning plant in Kuruman located at Portion 1 of ERF 1, next to municipal testing grounds, opposite livestock auction premises, and diagonally opposite the red meat abattoir within Ga–Segonyana Municipality under John Taola Gaetsewe District Municipality, Northern Cape (2011).
- **Independent Development Trust:** EIA for proposed secondary school in Freedom Park (2008–2010)

Project Experience cont



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship

Environmental Impact Assessments and Plans in terms of the Mineral & Petroleum Resources Development Act 2002 (Act No.28 of 2002)

- **ALS BEE Projects:** Environmental Management Plan for TCC Gravel Mine in support of mining permit (Site 1 and 2) on Portion of the remainder portion 488 of town and townlands, 235 JQ Potchefstroom within Tlokwe City Council (2011).
- **Mafikeng Cement (Pty) Ltd:** Environmental Impact Assessment for the proposed Mafikeng Cement Project within Mahikeng and Ditsobotla Local Municipalities, North West Province (2010)
- **Smart Geo Science:** Environmental Management Plan for an application for prospecting right, for Remainder and Portion 1(Samekos) of Farm Kookfontein No 31, Portion 1,2,3,4 and the Remainder of farm No 33, Portion 1 and the Remainder of Farm 49, Portion 1,2,3 and the Remainder of Farm Van Wyksfontein No 50 and Portion 1,2 and Remainder of Farm of Farm No 51. Barkley west, within Northern Cape Province.
- **Smart Geo Science:** Environmental Management Plan for an application for prospecting right, for portion 2 and 63 of the Farm Middelviei 255 IQ, District of Randfontein (2012).
- **Alizay Properties 31 (Pty) Ltd:** Environmental Management Plan in support of the prospecting operation, in respect of farms Blaauwkop 271 it, Schimmelhoek 272 it, Steenkoolspruit 275 it, Onverwacht 273 it/others (situated within Magisterial District of Ermelo, Mpumalanga Province.
- **Silver Unicorn Trading 33 (Pty) Ltd:** Environmental Management Plan for an application for prospecting right, for Silver Unicorn Trading 33 (Pty) Ltd located at portion of the farm and remaining extent of portion 112 of farm Nooitgedacht 268 it, situated within the Magisterial District of Ermelo, Mpumalanga Province (2011).

Project Experience cont



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship

Water Use Licence Application in terms of the National Water Act 1998 (Act No. 36 of 1998)

- **Trans Hex Operations (Pty) Ltd:** Integrated Water and Waste Management Plan (IWWMP) in terms of the National Water Act 1998 (Act No. 36 of 1998), for De Punt Mine located within the Matzikana Municipality, Western Cape (2013).
- **Trans Hex Operation (Pty) Ltd:** Water use licence applications (2006–ongoing).
- **Enermin Africa (Pty) Ltd:** Water Use Licence Application for Koi-Koi Crushers Project, Situated on Part of Farm Molopo–Ratshidi 302 Jo, within Mafikeng Local Municipality.
- **Vuka Afrika Consulting Engineers and Project Managers:** Water use licence application for the construction of the proposed Bokamoso Sewage Outfall Pipeline (2011–current), North West Province.
- **Aplorox cc:** Water Use Licence Application for the Proposed Operations Of Railway Siding and Associated Environmental Aspects on Forfar Railway Siding Portion 131 of the farm Vaalbank 511 Jr within the Kungwini Local Municipality (2014).
- **Clover Alloys (SA) (Pty) Ltd:** Water Use Licence Application for the proposed Crushing and Screening Beneficiation Plant On Portion 23 (Portion 13–Lg 306) of Farm Rietfontein, under Rustenburg Local Municipality (2014).

Environmental Training



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship

- **ALS BEE Projects:** Environmental Management Plan for TCC Gravel Mine in support of mining permit (Site 1 and 2) on Portion of the remainder portion 488 of town and townlands, 235 JQ Potchefstroom within Tlokwe City Council (2011).
- **Trans Hex Operations (Pty) Ltd:** Ongoing environmental training of employees with environmental obligations to promote compliance with conditions of the environmental management plans – Environmental awareness and competence training on how to implement environmental commitments (for Baken Mine, Bloeddrieff Mine and Reuning Mine). Focusing on Mining and Earth moving, Mineral Processing and Support and services such as water supply personnel. Training also incorporated members of community property association who are responsible for monitoring EMP implementation on site. (2005, 2006, 2009 and 2010).
- **Gropec (Pty) Ltd:** Managing Environmental Aspects – Waste Management Training Course for Eskom’s Kendal Power Station employees, Witbank, Mpumalanga (2013).

BEE Empowerment [Level 1]



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship



Premier Project Team



Project Team & Associates

- Myezo has a pool of associates to act as support structures for individual projects. We have built relationships with specialists from across a variety of fields e.g. ground water.
- We are able to manage and co-ordinate a suite of specialists as part of the contribution to the impact assessment evaluations as well a in determination of management measures for particular projects.



Babalwa Atalanta Fatyi [Founder & Director]

Myezo Environmental Management Services (Pty) Ltd was founded by Babalwa Atalanta Fatyi – in 2005.

Achievements

- Registered Professional Natural Scientist with Master of Science (Cum Laude) (1999).
- Received a SA Association for Advancement of Science Award for an outstanding MSc degree in the Faculty of Science, 1999
- A Business Women Association: Finalist for Regional Achiever Awards, 2007

Academic Qualifications

- Master of Science – Wits University (Cum Laude), 1999
- Bachelor of Science Honours (Botany) – Wits University, 1997
- Bachelor of Science – University of Transkei, 1996

Affiliations

International Association of Impact Assessments – South African affiliate

Professional Registration

- Registered in terms of Article 11 of Natural Scientific Professions Act, 1993 (Act 106 of 1993). Professional title: *Pr.Sci.Nat*
- Environmental Auditor: Institute of Environmental Management and Assessment (IEMA), Lincoln, UK



Babalwa Atalanta Fatyi [Founder & Director]

Myezo Environmental Management Services (Pty) Ltd was founded by Babalwa Atalanta Fatyi – in 2005.

Achievements

- A Business Women Association: Finalist for Regional Achiever Awards, 2007



Babalwa Atalanta Fatyi [Founder & Director]

Myezo Environmental Management Services (Pty) Ltd was founded by Babalwa Atalanta Fatyi – in 2005.

Achievements

- Celebrating Excellence in Organizations Global: Africa's Most Influential Women Awards. Arts and Culture Sector 2015



Babalwa Atalanta Fatyi [Founder & Director]

Myezo Environmental Management Services (Pty) Ltd was founded by Babalwa Atalanta Fatyi – in 2005.

Publications

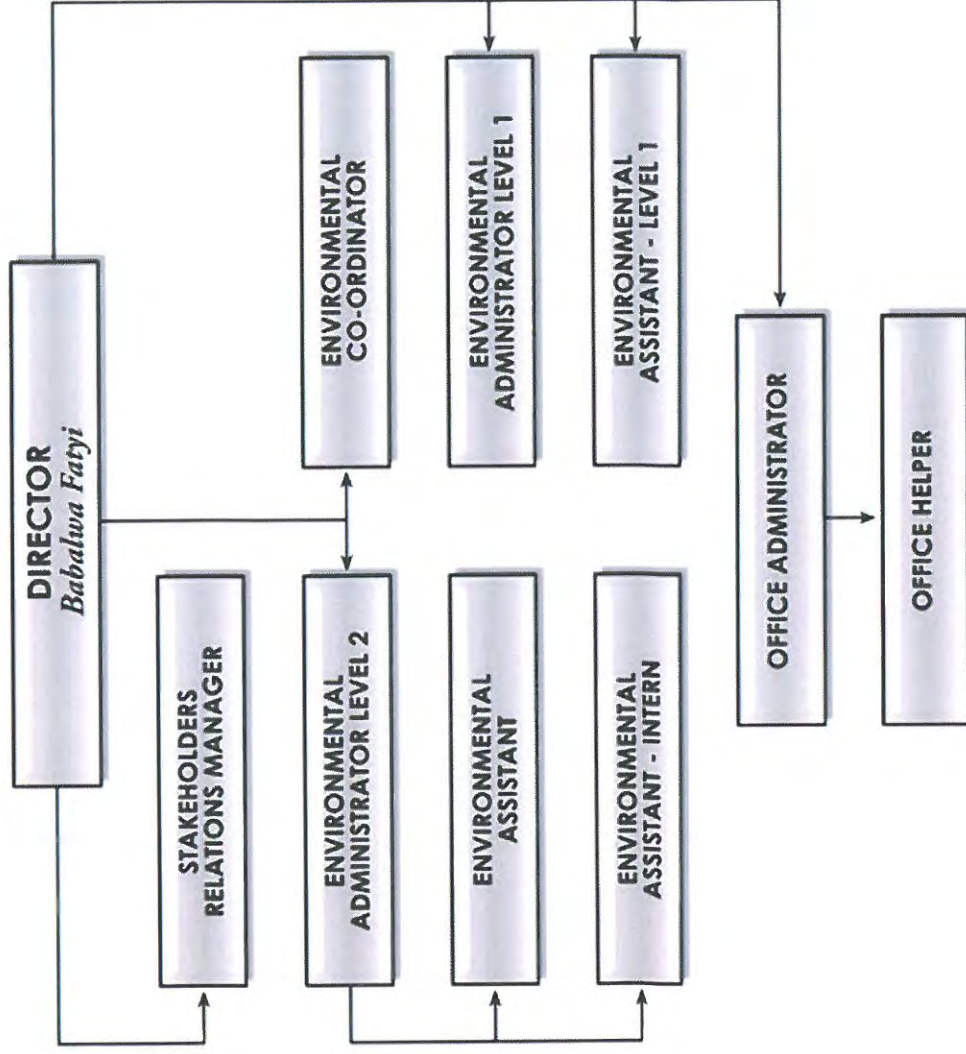
- B.A Mbalo (Fatyi) and E. T. F. Witkowski (1997): Tolerance to soil surface temperature experienced during and after the passage of fire in seeds of selected savanna woody plant species. South African Journal of Botany, 63: 423–425.
- N. Mol and B.A Mbalo (Fatyi) (2001): South African Legislation: A step in the right direction. Presented at the Chamber of Mines Conference on Environmentally Responsible Mining: Conference Proceedings, 2001.
- E.T.F Witkowski and BA Mbalo (Fatyi) (2002): Interactive effects of post fire cues, soil nitrate and smoke on germination. Journal of Arid Environments 38: 541– 550.
- Witkowski, ETF and Mbalo, B (2002). Interactive effects of the post–fire cues, soil nitrate. Journal of Arid Environments 38: 541–550.



Company Organogram



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship



Socio-Economic Contributions, Coaching & Mentoring



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship



Coaching & Mentoring



MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd
Environmental Stewardship

- Myezo believes in transferring of skills through mentoring and coaching of previously disadvantaged and unemployed youth and graduates, in the environmental management field, by allocating resources for coaching in practical assignments and other key relevant aspects of environmental management.
- As part of mentoring, Myezo partnered with Cape Peninsula University of Technology to provide students with six months experiential training programme. This is a structured programme and Myezo provides the support to students to assist them to obtain their qualification in the form of mentoring and coaching.
- The internship is focused on stimulating the students, to facilitate the:
 - ability to reason and be self-aware,
 - enhancement of objective analysis of situations,
 - application of insights to the interns to unlock the individual's own potential to maximise their performance.
 - Ability to achieve their career goals and outcomes.

Coaching and Mentoring



MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd
Environmental Stewardship

Providing sustainable opportunities

Every project that Myezo receives is seen as a platform to provide an opportunity to transfer skills to unemployed graduates or those that seek experiential training. This is a contribution to a situation that is currently facing our country. Include amongst others: Skills our future stars and leaders have acquired.

- Implementation of environmental impact assessment
- Project management skills
- Report writing skills
- Colleague liaison skills
- Communication skills
- Presentation and facilitation skills
- Stakeholder and regulatory involvement
- Budget control and monitoring skills
- Environmental legislation interpretation and application



Coaching and Mentoring



**MYEZO ENVIRONMENTAL
MANAGEMENT SERVICES [Pty] Ltd**
Environmental Stewardship

Providing sustainable opportunities...

- Data collection (Site visits and investigations)
- Data analysis (analysis of collected data and mapping)
- Report writing and presentation of finding
- General character traits that are critical for development in the professional field we operate in such as those related to taking initiative, punctuality, decision making and reliability.

The past unemployed youth, Babalwa has mentored have shown their appreciation and all of them are now either employed at Myezo or absorbed in different industries. They are now actively participating in the economy of this country.





MYEZO ENVIRONMENTAL MANAGEMENT SERVICES [Pty] Ltd

Environmental Stewardship



Contact

Babalwa Fatyi – *Pr.Sci.Nat* [Director]

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Email: babalwa@myezo.co.za – www.myezo.co.za

- **Annexure 1: Babalwa Fatyi CV**

CURRICULUM VITAE
OF
BABALWA ATALANTA FATYI

PERSONAL DETAILS

Name Babalwa Atalanta Fatyi (South African)

ID Number: 7212252528082

Residential address: No. 68 Sunset Villas, Langeveldt Street, Vorna Valley

Postal address P O Box 13972, Vorna Valley, 1686

Tel: (012) 998-7642 **Cell:** 082 772 2418

Fax: (012) 998-7641

WORK EXPERIENCE**2005 - to date**

Myezo Environmental Management Services (Managing Member)

- Environmental management programmes
- Environmental impact assessments
- Environmental auditing
- Public consultation

2003-2005

Trans Hex Operation (Pty) Ltd

Environmental Management Co-ordinator with activities including:

- Development of legal registers
- Water Use Licence applications
- Environmental Auditing (internal audits)
- Environmental management programmes
- Implementation of various statutes for both land and marine operations
- Implementation of environmental management plans
- Rehabilitation and closure plans
- Development of waste management plans
- Stake holder involvement
- Environmental awareness and competence training

1999 - 2003

SRK Consulting - Environmental Department. Activities include:

- Environmental impact assessments
- Public/stakeholder consultation
- Environmental management programme reports
- Environmental training
- Environmental auditing
- Environmental management systems
- Project co-ordination and management

A list of projects undertaken to date is provided in Page 3.

1996-1998

University of the Witwatersrand

- Teaching assistant.
 - Participated in Wits Partnership Programme - Teaching biological and physical sciences in high schools.
-

SKILLS COMPETENCY TRAINING

Executive preparation programme - Preparation for active participation in the mining industry: Provided by Mining Qualifications Authority in conjunction with University of Johannesburg for a period of six months - 2005.

Microsoft Project - Basic/Intermediate Course provided by Companion ICT Training – 20 May 2013
Safety, Health, Environment and Quality Awareness provided by Hydro Training Academy (Pty) Ltd- 28 January 2014

Competence to Perform b=Basic First Aid provided by Hydro Training Academy (Pty) Ltd- 12 February 2014

SHE Representative by Hydro Training Academy (Pty) Ltd-07 March 2014

B-BBEE Champions Course by Transcend Corporate Advisors-21-23 January 2014.

Transition from ISO 14001: 14001:2015 Environmental Management Systems, CEM-03.6b, in North West University.

Global Mapper advanced on training GIS case studies and examples, advanced data processing, and LIDAR processing, 3D modelling and terrain analysis.

EDUCATION

Junior Secondary

Ngqunge Junior Secondary School – Physical Science, Mathematics and Chemistry – Umtata - 1986

High School

Matriculated at St John's College. – Physical Science, Mathematics and Chemistry- Umtata – 1990

Qualifications obtained

- BSc (University of Transkei), 1996
- BSc (Hons) Wits), 1997
- MSc Wits (*Cum Laude*), 1999

Major courses obtained

- Botany
- Zoology

All the above mentioned courses enhanced my understanding of structure and functioning of ecosystems as well as integrated environmental management and its associated tools such as environmental impact assessment. The research equipped me with thinking and problem-solving skills including drawing well reasoned conclusions from complex data, recognising developing problems and handling them.

OTHER AREAS OF COMPETENCY

Languages

- English: speak, read, write – Excellent
- Xhosa: Speak, read, write – Outstanding
- Zulu: speak; read, write – Good
- Sotho: speak – Basic

Environmental legislation

I have acquired skills in environmental legislation interpretation. I have an excellent understanding of legal requirements with respect to various environmental management tools.

Skills acquired

- Project management skills

- Report writing skills
- Colleague liaison skills
- Communication skills
 - Presentation and facilitation skills
 - Stakeholder and regulatory involvement
- Environmental legislation interpretation and application
- Business development skills
- Client partnering skills
- Budget control and monitoring skills
- Statistical analysis (Stats packages: Systat)

Undertaking environmental impact assessments and public consultation within the consulting industry has strengthened my skills in being able to realise the objectives of the clients as well as empower the public so they better understand their environmental rights and opportunities in a particular development situation. Working in various phases of development projects has enhanced my appreciation of the holistic view/approach in project management. In addition, my role within the mining industry has strengthened my expertise with respect to implementation of various programmes.

AWARDS

- Business Women Association: Finalist for Regional Achiever Awards 2007
- South African Association for Advancement of Science Medal: awarded for an outstanding MSc degree in the Faculty of Science (2000)
- Celebrating Excellence in Organizations Global: Africa's Most Influential Women Awards. Arts and Culture Sector 2015
- Women of Wonder Awards (WOW) (2016): One of the recipient for the prestigious Annual Women of Wonder Awards for hard work, perseverance and dedication that has managed to courageously strive to achieve dreams and aspirations and serve as a role model to South Africans.

AFFILIATIONS

- International Association of Impact Assessments - South African affiliate
- The Institute of Directors in Southern Africa - South African affiliate

PROFESSIONAL REGISTRATION

- Registered in terms of Article 11 of the Natural Scientific Professions Act, 1993 (Act 106 of 1993). Professional title: Pr. Sci.Nat (400123/01)
- Associate Environmental Auditor: Institute of Environmental Management and Assessment (IEMA), Lincoln, UK

PROJECT EXPERIENCE

(Project Manager role in all the projects listed in this section unless otherwise specified)

APPLICATION FOR ENVIRONMENTAL AUTHORISATION

Environmental impact assessments and plans in terms of National Environmental Management Act, 1998 (Act No. 107 of 1998)

- **Rockstar Trading (Pty) Ltd (trading as CDF Chrome):** Environmental management plan in terms of NEMA for a Chrome Beneficiation Plant on Portion 86 of the Farm Hartebeesfontein 445 JO, Madibeng Local Municipality, North West Province (2011).

- **Elgagen (Pty) Ltd:** EMP done for a Chrome Benefication Plant on Portion 181 (A Portion of Portion 2 of the Farm Zandfontein 447 JQ Madibeng Local Municipality, North West province. (2011).
- **Athi River Mining South Africa (Pty Ltd:** Environmental impact assessment in terms of National Environment Management Act, 1998 (Act 107 of 1998) for a Proposed Mafikeng Cement Project and Associated Activities, including quarry within Ngaka modiri Molema district Municipality (2010-2011).
- **The GHAAP Abattoir Ostrich (Pty) (Ltd) (GHAAP), funded by Sishen Iron Ore Company – Community:** Development Trust (SIOC-CDT): Environmental impact assessment/basic assessment for a proposed abattoir and deboning plant in Kuruman located at Portion 1 of ERF 1, next to municipal testing grounds, opposite livestock auction premises, and diagonally opposite the red meat abattoir within Ga-Segonyana Municipality under JohnTaolo Gaetsewe District Municipality, Northern Cape (2011).
- **Solid Waste Technologies SA (Pty) Ltd:** Public participation coordination for hazardous waste treatment facility in City Deep- Johannesburg (2009) and application for environmental authorisation for a transfer station in Durban (2010).
- **Sasol Mafutha (Pty) Ltd:** Myezo subcontracted to SE Solutions to assist with public involvement and reports review for four EIA's done for Mafutha Mine, Town development, Coal to Liquid plant and Services corridor (2009-).
- **Independent Development Trust:** EIA for proposed secondary school in Freedom Park (2008-2010).
- **Metsweding District Municipality:** EIA for proposed Cemetery at Ekandustria (2008- 2010).
- **SE Solutions:** Public participation for proposed capacity expansion of the iron making, steelmaking and rolling facilities at ArcelorMittal South Africa, Newcastle Works (2008-current).
- **SES Solutions:** Public participation for planned coke oven expansion at Mittal Steel (2007-2008).
- **SES Solutions:** Public consultation for a planned by-products mixing plant at Mittal Steel (2006).
- **Clear Channel Independent:** EIA for proposed erection of advertising billboards (2006-2007).
- **Toka Outdoor Advertising (Pty) Ltd:** EIA for proposed erection of advertising billboards (2006-2007).
- **Mbokod Outdoor (Pty) Ltd:** EIA for proposed erection of advertising billboard (2006).
- **Dolphin Outdoor:** EIA for proposed erection of advertising billboards (2006).
- **Primedia Outdoor (Pty) Ltd:** EIA for proposed erection of advertising billboards (2006-2007).
- **Matla Consultants:** Environmental scoping study for a road upgrade in the Brits District, Northwest Province (2005).
- **Rustenburg Local Municipality:** Basic assessment/EIA for the proposed construction of Bokamoso Sewage Pipeline, Rustenburg Local Municipality, North West Province (2012).
- **Mafikeng cement (Pty) Ltd:** Environmental Impact Assessment for the proposed Mafikeng Cement Project within Mahikeng and Ditsobotla Local Municipalities, North West Province (2010).
- **Tsosoletso Resources (Pty) Ltd:** Environmental Management Plan for Sunbury Siding Project, within Mpumalanga Province (2012).
- **Trans Hex Operations (Pty) Ltd** -Application for Consolidating Application in Terms of Sub-Regulation 14(1) of EIA Regulations, 2010 (GNR 543 of 18 June 2010), under the National Environmental Management Act, 1998 (Act No. 107 of 1998) for Environmental Authorization for Sea Concession 5a, 6a, 7a,3b and 5b within the Administrative District of Namaqualand.
- **SALP Constructions (Pty) Ltd**-Environmental Management Plan for the proposed development at Masebe Nature Reserve with the Mogalakwane Local Municipality, Limpopo (2014).
- **Gijima Supply Chain Management Services (Pty) Ltd**-Environmental Control Officer for Arbor Siding, within Mpumalanga Province (2015).

- **Gubha Mining Resources (Pty) Ltd**-Basic Assessment Report prospecting right in terms of Section 16 of the Mineral and Petroleum Development Act, 2002 (Act No. 28 of 2002) for proposed development at Naudesbank in Mpumalanga (2015).
- **Makson Trading Enterprise CC**-Performance Assessment Report for Makson Trading Enterprise CC located in Xhalanga Local Municipality within the Magisterial District of Chris Hani, in Eastern Cape Province (2015).
- **West Coast Resources (Pty) Ltd**: Amendment of an Environmental Management Programme (EMP) and Environmental Impact Assessment (EIA), in support of a mining right held by West Coast Resources (WCR), over the Namaqualand Mines, in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and Mineral and Petroleum Resources Development Act, (Act No. 28 of 2002) (MPRDA) within the Administrative District of Namaqualand, Northern Cape.

Basic Assessment Report in terms of National Environmental Management Act (Act No. 107 of 1998)

- **Aplorox CC**-Basic Assessment Report for the proposed coal storage at Forfar Siding on Portion 131 of the Farm Vaalbank 511-JR with the Kungwini Local Municipality, Gauteng (2014).

APPLICATION FOR MINING AUTHORISATION

Environmental impact assessments and plans in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)

- **Double Ring Mineral Resources (Pty) Ltd**: Environmental Management Plan for the proposed gold processing site within the Farm Batavia 176 KP in Thabazimbi, Limpopo Province (2012).
- **ALS BEE Projects**: Environmental Management Plan for TCC Gravel Mine in support of mining permit (Site 1 and 2) on Portion of the Remainder Porrtion 488 of Town and Townlands, 235 JQ Potchefstroom within Tlokwe City Council (2011).
- **Smart Geo Science**: Environmental Management Plan amendment for a mining permit for Batavia Project, within Mpumalanga Province (2012).
- **Smart Geo Science**: Environmental Management Plan for an application for prospecting right, for Remainder and Portion 1(Samekos) of Farm Kookfontein No 31, Portion 1,2,3,4 and the Remainder of farm No 33, Portion 1 and the Remainder of Farm 49, Portion 1,2,3 and the Remainder of Farm Van Wyksfontein No 50 and Portion 1,2 and Remainder of Farm of Farm No 51. Barkley west, within Northern Cape Province.
- **Smart Geo Science**: Environmental Management Plan for an application for prospecting right, for portion 2 and 63 of the Farm Middelvlei 255 IQ, District of Randfontein (2012).
- **Alizay Properties 31 (Pty) Ltd**: Environmental Management Plan in support of the prospecting operation, in respect of the farms Blaauwkop 271 it, Schimmelhoek 272 it, Steenkoolspruit 275 it, Onverwacht 273 it and others (situated within the Magisterial District of Ermelo, Mpumalanga Province).
- **Silver Unicorn Trading 33 (Pty) Ltd**: Environmental Management Plan for an application for prospecting right, for Silver Unicorn Trading 33 (Pty) Ltd located at portion of the farm and remaining extent of portion 112 of farm Nooitgedacht 268 it, situated within the Magisterial District of Ermelo, Mpumalanga Province (2011).
- **African Exploration Mining and Corporation (Pty) Ltd**: Environmental Management Plan in support of application for a prospecting right, on Farms Paynesvale 608, Kingston 607, Klippan 377, Geduld 661, Thanet 126 and Steyn'Shoek, within the Magisterial District of Kroonstad, Free State Province (2010).

Environmental management programmes in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)

- **Athi River Mining South Africa (Pty) Ltd:** Environmental Management Programme is support of a mining right in terms of Section 39 and of Regulation 50 and 51 of Mineral and Petroleum Resource Development Act, 2002 (Act No.28 of 2002), Mahikeng, North West Province. (2012-2013).
- **Enermin Africa (Pty) Ltd:** Environmental Management Programme is support of a mining right in terms of Section 39 and of Regulation 50 and 51 of Mineral and Petroleum Resource Development Act, 2002 (Act No.28 of 2002), Mahikeng, North West Province. (2012-2013).
- **Trans Hex Operation (Pty) Ltd:** Development of environmental management plans and environmental performance audits for marine and land operations (2005-2012 (on going). Projects include:
 - Environmental management programme updates, audit and closure plan for Brazil Farm.
 - Environmental management programme updates for Hondeklip Bay Operation.
 - Environmental management plans for more than 30 prospecting rights application in the Limpopo, Gauteng, Northwest and Northern Cape.
 - Closure plans for more than twenty prospecting rights.
- **Environmental Resource Management (SA):** Coordination and management of an environmental impact statement for a Burkina Faso Zinc Mine (2005).
- **Mineral Capital Assets:** Development of prospecting environmental management plans for farms on the Northwest Province. (2005).
- **Enermin Africa (Pty) Ltd:** Environmental Management Programme Report for the proposed Koi Koi Stone Quarry Project (2012), MR.
- **Mafikeng Cement(Pty) Ltd:** Environmental Management Programme Report submitted for an application for mining right for Mafikeng Cement Project (2012), MR.
- **Trans Hex Operations (Pty) Ltd:** Revised Environmental Management Programme Report updates for Sea Concession 5a, 6a, 7a, 3b and 5b Northern Cape (2013), MR.
- **Alexkor SOC Ltd:** Environmental Management Programme in respect of Sea Concession 1(c) Mining Project, Northern Cape Province (2013) MR.
- **Alexkor SOC Ltd:** Environmental Management Programme in respect of Sea Concession 4(a) Mining Project, Northern Cape Province (2013) MR.
- **Alexkor SOC Ltd:** Section 93 order in for a mining right issued on Portion 14, 15, 16, 17 and 19 of the Farm Korriodor WES No.2, Farm 1, Farm Brandkaros No.617, Farm Arrisdriфт No.616, Farm No.155 and Remainder of Farm Gypsums No.5 Situated in the Administrative District of Namaqua (2013).

Country reports, sustainability reports and closure plans

- **Department of environmental Affairs and Tourism:** Fourth Country Report for United Nations Convention to Combat Desertification (2008).
- **Wesizwe:** Development of sustainability framework including policies, standards and guidelines (2008-2009).
- **Etruscan Resources Inc:** Environmental Management Programme in support of a mining right application (2007)
- **Trans Hex Operations (Pty) Ltd:** Closure plans and associated performances assessment audits and financial provision calculations for prospecting farms. (200-current).
- **Unimining Joint Venture:** Implementation of environmental measures during rehabilitation of an asbestos Mine – Heningvlei (2006-2007).
- **Department of Minerals and Energy-Council for Scientific and Industrial Research Project for abandoned Mines:** Myezo subcontracted by CSIR for development of Environmental Best Practice guidelines for Granite Mines in the North –West Province. (2005).
- **Alexkor SOC Ltd:** Alexkor's Five Year Implementation Land Rehabilitation Plan at its Alexander Bay Mine in Northern Cape (2014).

- **Trans Hex Operations (Pty) Ltd:** Application for Closure Certificates in terms of Section 43 (4) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), were prepared for various prospecting activities undertaken in the following farms in Northern Cape by Trans Hex. (10 Closure Plans were prepared) (2009).
- **Trans Hex Operations (Pty) Ltd:** Application for Closure Certificates in terms of Section 43 (4) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), were prepared for various prospecting activities undertaken in the following farms in North West by Trans Hex. (23 Application for Closure Plans were prepared) (2009).
- **Trans Hex Operations (Pty) Ltd:** Application for Closure Certificates in terms of Section 43 (4) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), were prepared for various prospecting activities undertaken in the following farms in Limpopo by Trans Hex. (19 Application for Closure Plans were prepared) (2009).
- **Trans Hex Operations (Pty) Ltd:** Application for Closure Certificate in terms of Section 43 (4) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), for Sea Concession 11c, 13c and 18d, Vredendal District, Western Cape (2012).
- **Trans Hex Operations (Pty) Ltd:** Application for Closure Certificate in terms of Section 43 (4) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), in for Portion 1 of Farm Amam No. 46, Namaqualand District, Northern Cape (2013).
- **Alexkor SOC Ltd:** Climate Change Plan as Directed by the Department of Public Enterprises Climate Change Policy Framework for State Owned Companies (2014).

Environmental Training

- **Gropec (Pty) Ltd:** Developed training material and provided environmental awareness training to about 600 employees of Eskom's Kendal Powerstation on matters related environmental rights as prescribed by Section 24 of National Environmental Management Act (107 of 1998) and waste management, auditing and general matters related to pollution control. (2012-2013).
- **Elgagen (Pty) Ltd:** Environmental awareness training for personnel responsible for implementing the EMP and also awareness provided for the adjacent community to partner with the plant in monitoring environmental commitments (2010).
- **Trans Hex Operations (Pty) Ltd:** Ongoing environmental training of employees with environmental obligations to promote compliance with conditions of the environmental management plans – Environmental awareness and competence training on how to implement environmental commitments (for Baken Mine, Bloeddrift Mine and Reuning Mine. Focusing on Mining and Earth moving, Mineral Processing and Support and services such as water supply personnel. Training also incorporated members of community property association who are responsible for monitoring EMP implementation on site. (2005, 2006, 2009 and 2010).
- **Reuning Mine:** Environmental awareness training on waste management for all employees with environmental responsibilities to ensure that there is waste minimisation and proper handling and management of waste disposal landfill sites (2010).
- **CGM Louis Trichardt Joint Venture, Kutama-Senthumule Maximum Security Prison:** Training of senior construction site personnel in environmental management. (2000).
- **Etruscan Diamonds (Pty) Ltd:** Environmental training of employees with environmental obligations to promote compliance with conditions of the environmental management plans (2008).
- **Etruscan Diamonds (Pty) Ltd:** Environmental training of the community who were 26% shareholders in the mining venture to be able to understand the environmental commitments and assist in monitoring compliances (2008).
- **Abongi Bemvelo Services:** Environmental training of personnel in environmental management – introduction to mining (2008).
- **Gropec (Pty) Ltd:** Environmental Awareness Training Course for Eskom's Kendal Power Station employees, Witbank, Mpumalanga (2012).
- **Gropec (Pty) Ltd:** Managing Environmental Aspects – Waste Management Training Course for Eskom's Kendal Power Station employees, Witbank, Mpumalanga (2013).

Environmental Auditing

- **Trans Hex Operations (Pty) Ltd:** Lead auditor for annual external audits undertaken for Trans Hex's mining operations- Baken Mine, Bloedriff Mine and Reuning Mine, Northern Cape (2005, 2006, 2007 and 2008).

- **Trans Hex Operations (Pty) Ltd:** Lead Auditor for biannual performance assessment external audits for Baken Mine, Bloedferr Mine and Reuning Mine, Northern Cape (2010, 2012)
- **Trans Hex Operations (Pty) Ltd:** Lead auditor and environmental audit reports compilation for prospecting mining closure applications (More than 20 audits and closure application (2008-ongoing).
- **Trans Hex Operations (Pty) Ltd:** Lead auditor for Annual and quarterly internal audits undertaken for five mining operations in preparation for the external audits (2003-2004).
- **Trans Hex Operations (Pty) Ltd:** Annual and two yearly external monitoring and performance assessment audits and annual financial provision revision for Sea Concession 11(a) and 12(a) and 13(a), Northern Cape 2005-2011 (in progress).
- **Trans Hex Operations (Pty) Ltd:** Performance assessment audits for sea concession area 3(b), 5(b) (5a), 6(a) and 7(a), Northern Cape (2012).
- **Trans Hex Operations (Pty) Ltd:** Performance assessment biannual audits for Hondeklip Bay Mine and Brazil Mine. (2012).
- **Double Ring Mineral Resources (Pty) Ltd:** Performance Assessment for prospecting activities on Farm Goedehoop 196 HT, Piet Retief in Mpumalanga Province (2012).
- **Enermin Africa (Pty) Ltd:** Performance Assessment for Enermin Africa (Pty) Ltd prospecting activities on Farm Molopo Ratshidi 302, within the Mafikeng Local Municipality, North West Province (2013).
- **Alexkor Ltd:** Performance assessment report for the prospecting activities undertaken over Sea Concession 1(c), within the Administrative District of Namaqualand, Northern Cape (2013).
- **Double Ring Mineral Resources (Pty) Ltd:** Performance assessment report for the mining activities on Farm Batavia 176 KP, within the Magisterial District of Thabazimbi, Limpopo province (2013).
- **Trans Hex Operations (Pty) Ltd:** Performance Assessment Report for Sea Concession 11(A), 12(A), 13(A) and corresponding Surf Zones and Admiralty Strip (2013).
- **Trans Hex Operations (Pty) Ltd:** Performance assessment report for Transhex Bloeddrift Agricultural Activities located on Farm 11 and Portion 5 of Bloeddrift within the Richtersveld Local Municipality, Northern Cape Province (2013).
- **Trans Hex Operations (Pty) Ltd:** Performance Assessment Audit for Baken Mine Situated in The Richtersveld Local Municipality Under the Namakwa District Municipality, Northern Cape Province (2014).
- **Trans Hex Operations (Pty) Ltd:** Performance Assessment Audit for Bloeddrift Mine Situated in The Richtersveld Local Municipality Under the Namakwa District Municipality, Northern Cape Province (2014).
- **Trans Hex Operations (Pty) Ltd:** Performance Assessment Audit for Reuning Mine Situated in The Richtersveld Local Municipality Under the Namakwa District Municipality, Northern Cape Province (2014).
- **Alexkor SOC Ltd:** Renewal report for the prospecting activities undertaken over Sea Concession 1(c) within the Administrative District of Namaqualand, Northern Cape Province (2013).
- **Alexkor SOC Ltd:** Performance assessment for the prospected Sea Concession 1(c) located with Administrative District of Namaqualand, Northern Cape Province (2013).

Boat Launching Application in terms of Regulation 7 of the regulations published in terms of Section 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and GN No. 1399 of 21 December 2001

- **Trans Hex Operations (Pty) Ltd:** Boat Launching Application in terms of Regulation 7 of the regulations published in terms of Section 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and GN No. 1399 of 21 December 2001 for the proposed Brazil Boat Launching Site, in Northern Cape (2012).

Waste License Application in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)

- **Trans Hex Operations (Pty) Ltd:** Environmental Impact Assessment Report for Baken and Bloeddrift Mine Waste Disposal Site, Northern Cape (2012).

Water Use Licence Application in terms of the National Water Act, 1998 (Act No. 36 of 1998)

- **Trans Hex Operations (Pty) Ltd:** Integrated Water and Waste Management Plan (IWWMP) in terms of the National Water Act, 1998 (Act No. 36 of 1998), for De Punt Mine located within the Matzikana Municipality, Western Cape (2013).
- **Trans Hex Operation (Pty) Ltd:** Water use licence applications (2006-ongoing)
- **Enermin Africa (Pty) Ltd-**Water Use Licence Application for Koi-Koi Crushers Project, Situated on Part of Farm Molopo-Ratshidi 302 Jo, within Mafikeng Local Municipality.
- **Vuka Afrika Consulting Engineers and Project Managers:** Water use licence application for the construction of the proposed Bokamoso Sewage Outfall Pipeline (2011-current), North West Province.
- **Aplorox cc-** Water Use Licence Application for the Proposed Operations of Railway Siding and Associated Environmental Aspects on Forfar Railway Siding Portion 131 of The Farm Vaalbank 511 Jr Within the Kungwini Local Municipality (2014).
- **Clover Alloys (SA) (Pty) Ltd-** Water Use Licence Application for the proposed Crushing and Screening Beneficiation Plant On Portion 23 (Portion 13-Lg 306) of Farm Rietfontein, Under Rustenburg Local Municipality (2014).

Rectification of an Unlawful Activity in terms of Section 24 G of the National Environmental Management Act, 1998 (Act No. 107 of 1998)

- **Alexkor SOC Ltd-** Application for rectification an unlawful activity on Farm No. 1 and Port Nolloth Reserve No. 115 within the Namaqualand District Municipality, Northern Cape.

Environmental Screens

- **Gijima Supply Chain Management Services (Pty) Ltd-**Environmental screen tool designed for use in assessing lease application for Arbor Siding Project within Emalahleni Local municipality, Mpumalanga (2014).

OTHER PROJECTS INVOLVEMENT PRIOR TO 2005

Environmental Impact Assessments

- **BHP/Resolute Joint Venture, Belahouro Gold Project:** Co-ordination of pre-feasibility level environmental scan for Belahouro Gold Mining Project, Burkina Faso (1999).
- **Rio Tinto Zimbabwe, National Power United Kingdom, Zimbabwe Electricity Supply Authority, Gokwe North Project, Zimbabwe:** Gokwe North Power Project environmental impact assessment (EIA), Zimbabwe: Legislation interpretation for an EIA to ensure compliance with World Bank requirements (1999).
- **Maguga dam Joint Venture:** Co-ordinated and managed Environmental impact assessment as required by the Swazi Environmental Authority for the construction of an attenuation dam downstream of Maguga Dam to regulate flow into the Komati River, Swaziland. (2001)
- **Jeffares and Green Inc and Gauteng Department of Public Works and Transport, PWV 9 Road:** Co-ordination and public involvement of the scoping study in support of environmental authorisation for the development of the PWV 9 toll highway, Gauteng. (1999 – 2001).
- **Ericsson Cellular SA (Pty) Ltd / Skanska Telecom Networks (Pty) Ltd / Proconord International OY, Installation of Cellullar Network:** Co-ordinated site screening, visual impact assessment and report writing for the proposed installation of cellular base stations, Gauteng. (2000-2001).
- **Rustenburg Local Municipality:** Basic Assessment for Construction of the Proposed Bokamoso

Sewage Pipeline on Portion 1,2,10,13,50 and 86 of the Farm Paardekraal 279 JQ, Portion 19 and 38 of the Farm Waterval 303 JQ and Remainder of Farm Waterval 303 JQ, Rustenburg Local Municipality, North West Province (2013).

Environmental Management Programme Reports

- **Barplats Mines Limited, Re-opening of Crocodile River Mine:** Co-ordination and a management of an EIA for the re-opening of Crocodile River Mine in the North West Province. The EIA was used to produce an environmental management programme report (EMPR) that was submitted to obtain mining authorisation in terms of the Minerals Act (No. 50 of 1991). (1999-2000).
- **Nkomati Joint Venture, Expansion of Nkomati Mine:** Management of a public involvement programme for an EIA to produce an EMPR for expansion of the Nkomati Mine, Mpumalanga, using open cast mining methods. (1999-2000).
- **Kroondal Platinum Mines Limited, Phase II Expansion:** Management of a public involvement programme for an amendment to an environmental management programme report, North West Province (2000-2001).
- **Rustenburg Platinum Mine-Union Section:** Co-ordination of an amendment (tailings dam, opencast section, a railway line and a mineral processing plant) to an environmental management programme report, Northwest, (2001-2002)
- **Rustenburg Platinum Mine-Union Section:** Management of a revision of an approved environmental management programme report into environmental management system format according to ISO 14001 specifications, Northwest Province (2001-2003).
- **Rustenburg Platinum Mine-Rustenburg Section:** Co-ordination of an environmental management programme report for an open cast mine in Waterval 306 JQ farm in Rustenburg, Northwest. (2001-2002).
- **Anglo American Platinum, Potgietersrust Platinums Limited:** Managed compilation of an environmental management programme report amendment for a new tailings dam in Potgietersrust, Northern Province. (2002).

COMPANY CONTRIBUTIONS

- SRK's Business Development Committee: Represented environment department in discussions on general company marketing initiatives and activities (2001).
- Employment Equity Committee: Review, monitor and make recommendations on SRK's employment policies, procedures and practices as stipulated in the Employment Equity Policy and Plan (2000-2003).
- Health and Safety representative (Myezo –current)

PUBLICATIONS

B.A Mbalo (Fatyi) and E. T. F. Witkowski (1997): Tolerance to soil surface temperatures experienced during and after the passage of fire in seeds of selected savanna woody plant species. South African Journal of Botany, 63: 423-425.

N. Mol and B.A Mbalo (Fatyi) (2001): South African Legislation: A step in the right direction. Presented at the Chamber of Mines Conference on Environmentally Responsible Mining: Conference Proceedings, 2001.

ETF Witkowski and BA Mbalo (Fatyi) (2002): Interactive effects of post fire cues, soil nitrate and smoke on germination. Journal of Arid Environments 38: 541- 550.

WITKOWSKI, ETF & MBALO, B (2002). Interactive effects of the post-fire cues, soil nitrate. Journal of Arid Environments 38: 541-550.

B.A Fatyi (2014) Greetings from my core. Xlibris. United Kingdom: Greetings from my core is about acknowledgement of our presence, our being, as well as the songs and aspirations, travel, victories, and supernatural encounters of our core.

SPEAKING ENGAGEMENTS

Africa MBA Indaba Conference and Career Fair (Fatyi) (2016): One of the 70 Dynamic speakers at the Africa MBA Indaba Conference and Career Fair under the session 'Women Trailblazers - Hear stories from successful women who have navigated the business world and are breaking down barriers for the next generation of women' (panel), which was addressing amongst others the prejudices experienced on my journey, how as women we overcame and continue to overcome, how are we paying it forward for those that will come behind us and the advice that we would say now to our younger self as "Women" Trailblazers.

LIST OF PERFORMANCE FOR GREETING FROM MY CORE BOOK

No.	Date of the event	Venue for the performance	Organiser for the event	Which poem was performed	Brief description of the event
1	18-Apr-15	Sandton, Park Inn	The events corner and tours	The savvy woman	The money savvy woman with Karabo Ramokho
2	28-Mar-15	James 1:27 Ministry	James 1:27 Ministry	Educational inequality	Educational inequality event
3	28-Mar-15	Rosebank Crowne Plaza	International Inspiring Woman Network Foundation	The woman I have become and weaving the nation stitch by stitch	67 blankets for Mandela
4	06-Dec-14	Innovatec Africa, Sandton	Divine connections	Girls self esteem	Divine youth event
5	21-Jun-14	The Maslow Hotel	Divine connections	Divine marriages	Divine connections event for marriages
6	19-Nov-14	Monte Casino	Skoobs bookstore	The woman I have become and Igorha elomba umgodi	Book launch for the Greetings from My core book
7	09-Oct-14	Methodist Church	Methodist church	Umfazi Endinguye	Empowerment of woman event

SHORT COURSES (Week)

- **Implementing Integrated Management Systems: ISO 9001, ISO 14001 and OHSAS 18001-** Potchefstroom University 2006.
- **Mining Qualifications Authority:** Executive preparation programme focusing on understanding key elements and principles of mining: presented by University of Johannesburg (2005).
- **Microsoft Project 2000:** Introduction: project management tool. Presented by Executrain. 2001.
- **National Environment Management: Integrated Coastal Management Act, 24 of 2008:** Presented by Imbewu Sustain Ability Legal Specialists (1 day) - 2010
- **Environmental Auditing:** Techniques and Methodologies. Presented by Eagle Environmental. 1999.
- **Implementing Environmental Management Systems (SABS/ISO 14001):** Presented by Centre for Environmental management -Potchefstroom University 2002.

- **Waste Management for Environmental Managers:** Presented by Centre for Environmental Management –Potchefstroom University 2003.
- **Environmental Management Tools in the Workplace:** Presented by Centre for Environmental management –Potchefstroom University.2003.
- **Sustainable Development short course** – Tools and techniques at mining operations. Presented by centre for sustainability in mining and industry. March 2003.
- **Environmental Auditor's course:** Aspects International, UK - IEMA approved. Presented by Crystal Clear Consulting and Merchants (Pty) Ltd .2004.
- **Business Finances for Non-Financial Managers:** Presented by Weidemann Consulting: Engineering and Management. 2001.
- **Introduction to Ground Water.** Presented by Ground Water Division of the Geological Society of South Africa. 2000.
- **Resource Conservation Biology:** Wits -1998
- **Population and Ecosystem Modelling:** Wits-1998
 - Good understanding of Scenario models -exploring management options; harvesting models adaptive management, surplus production, optimum sustainable yield, stock reduction, over -harvesting, uncertainty and harvest quotas.
- **Resource Economics:** Wits-1998
- **Geographic Information Systems (IDRISI for windows)** Wits: 1998

REFERENCES

Mr Mervyn Carstens

Executive Director: SA Land operations
 Trans Hex Operations (Pty) Ltd
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 Parow
 7499
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 Email: mervync@transhex.co.za

Mr Muleso Kharikha

Director: Resource use
 Department of Environmental Management Services
 Private Bag X447, Pretoria, 0001
 Tel: 012 310 3451/3578
 Cell: 083 2720302
 Email: jkharikha@deat.gov.za

APPENDIX I: OTHER INFORMATION

Acknowledge of Receipt Letter from GDARD



agriculture and rural development

Department: Agriculture and Rural Development
GAUTENG PROVINCE

11 Diagonal Street, Diamond Building, Newtown, Johannesburg
P O Box 8769, Johannesburg, 2000

Telephone: (011) 240-2500

Fax: (011) 240-2700

Website: <http://www.gdard.gpg.gov.za>

Reference:	002/16-17/E0097
Enquiries:	Malesela Sehona
Telephone:	(011) 240-3048
Email:	malesela.sehona2@gauteng.gov.za

Myezo Environmental Management Services (Pty) Ltd

Email/Fax. babalwa@myezo.co.za

Dear Sir / Madam

Application for Environmental Authorisation: The proposed environmental rehabilitation of the Klip Middle Soweto Water Management Unit (WMU) for the City of Johannesburg Municipality (CoJ)

The Department acknowledges having received the application form for environmental authorisation of the above-mentioned project on 28/07/2016.

The application has been assigned the reference number Gaut: 002/16-17/E0097. Kindly quote this reference number in any future correspondence in respect of the application.

Please circulate the draft report to any state department that administers a law relating to a matter affecting the environment to comment.

You are required to submit three (3) copies (full colour **two CDs-PDF and one hard copy**) of the Draft Basic Assessment Report as well as proof of submission to state departments referred to above.

In order to determine whether a biodiversity assessment is required and, if so, which specialist studies are required, please send a shapefile (WGS84 datum; geographic co-ordinate system) of the application site to our biodiversity information service

(GDACE_BiodiversityInfo@gauteng.gov.za), the e-mail clearly indicating the project reference number. Where biodiversity assessment is required; please ensure that it is conducted consistent with the *GDACE Requirements for Biodiversity Assessments*. A copy of this document can be obtained by e-mailing GDACE_BiodiversityInfo@gauteng.gov.za

In terms of Regulation 67(1) (2) of the NEMA EIA Regulations 2014, this application will lapse should you fail to submit the requested information within 3 months of the date of signature of this letter, except in the case where the Department has received and accepted written explanation for failure to submit such information.

Please draw the applicant's attention to the fact that the activity may not commence prior to an environmental authorisation being granted by the Department.

Yours faithfully



Boniswa Belot
Deputy Director: Strategic Administration Support
Date: 29/07/2015

CC: City of Johannesburg Municipality

Att: F Letsoko
Email/Fax: freddiel@joburg.org.za

REFERENCES

1. Barnard, H. C., 2000. An Explanation of the 1: 500 000 General Hydrogeological Map. Johannesburg 2526. Department of Water Affairs and Forestry.
2. Vegter, J. R., 1995. Groundwater resources of the Republic of South Africa. Sheets 1 and 2.
3. Mucina, L., and Rutherford, M.C. (eds.). 2006. *The Vegetation of South Africa, Lesotho & Swaziland, Strelitzia 19*. South African National Biodiversity Institute. Pretoria University Press.
4. Sazi. 2016. Biodiversity Assessment Report For City Parks and Zoo's Environmental Studies in Klip Middle Soweto within the City of Johannesburg Municipality, Gauteng Province. (Draft Report 15 June 2016)
5. CoJ Master Plan Framework
6. Gauteng State of the Environment report. 2003.
7. Pooley, E. (1998). *A Field guide to Wild-Flowers KwaZulu-Natal and the Eastern Region*, Durban: Flora Publications Trust.
8. Jacobsen, N. (2005). *Remarkable reptiles of South Africa*, Pretoria: Briza Publications.
9. Du Preez, L. & Carruthers, V. (2009). *A complete guide to the Frogs of Southern Africa*. Cape Town: Struik Nature.
10. Council for Geoscience, Lenasia sheet 2617BD, Scale 1:50 000, Date:s 2003, Geotechnical series, B.H. Mudau, 2000.
11. National Biodiversity Assessment. 2011.
12. Working for Wetlands, www.deat.dea.org.za.
13. Working for Water. 1996. www.dea.org.za.
14. Water Research Commission. 2016. Engineering News, 8 JUNE 2016.
15. Department of environmental affairs. Invasive alien plants. <https://www.environment.gov.za/projectsprogrammes/wfw/invasiveplants> .

CHECKLIST

To ensure that all information that the Department needs to be able to process this application, please check that:

- Where requested, supporting documentation has been attached;
- All relevant sections of the form have been completed.