

ENVIRONMENTAL MANAGEMENT PROGRAMME

AIRPORTS COMPANY SOUTH AFRICA (ACSA) PROPOSED FILLING STATION ON JONES ROAD, EKURHULENI METROPOLITAN MUNICIPALITY

Prepared for:



Airports Company South Africa

The Maples Office Park
Bedfordview, JHB

Prepared by:



Coastal & Environmental Services

1 Osborne Lane
EOH Business Park, Bedfordview
*Also in Grahamstown, East London, Port Elizabeth, Cape
Town and Maputo*

www.cesnet.co.za

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Appendix G: Environmental Management Programme

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1. INTRODUCTION

An Environmental Management Programme (EMPr) must consist of a set of mitigation, monitoring and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The programme also includes the actions needed to implement these measures.

1.1. Environmental Management Programme

An Environmental Management Programme (EMPr) can be defined as, “*an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the project are enhanced*”.

EMPr's are very important tools in the sound environmental management of projects, provided the specifications are implemented and the user understands the contents of the report and the reasons for the implementation of certain specifications.

The EMPr has the following objectives:

- To state standards and guidelines which are required to be achieved in terms of environmental legislation.
- To set out the mitigation measures and environmental specifications which are required to be implemented for all phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts and where possible to improve the condition of the environment.
- To provide guidance regarding method statements which are required to be implemented to achieve the environmental specifications (refer to Annexure 1 for an example of the method statement).
- To define corrective actions, this must be taken in the event of non-compliance with the specifications.
- To prevent long-term or permanent environmental degradation.

The following principles have been used in the preparation of the EMPr:

- Compliance with relevant legislation, standards, codes, and practices in the application of safe technologies;
- Minimisation of impacts on the environment and human beings;
- Performance of all activities in a safe and effective manner and maintenance of all equipment in good operating condition for the protection of the health and safety of all persons and to conserve the environment and property;
- Focus on environment risk prevention;
- Focus on occupational and public health, safety; and
- The undertaking of all necessary precautions to control, remove, or otherwise correct any leaks and/or spills of hazardous materials, or other health and safety hazards.

There are essentially four broad categories of EMPr's: Design EMPr, Construction EMPr, Operational EMPr and Decommissioning EMPr. The objectives of these EMPr's are all the same and include; identifying the possible environmental impacts of the proposed activity, and developing measures to minimise, mitigate and manage the negative impacts while enhancing the positive ones. The difference between these EMPr's is related to the different mitigation measures required for the different stages of the project life cycle. Each category of EMPr is discussed in more detail below.

1.1.1. Design EMPr

The Design EMPr is an integral component of the project life cycle and requires interaction between the design engineers and environmental consultants to ensure that the engineers are aware of the environmental constraints that must be considered and incorporated into the final design of the project.

The format of this design EMPr is checklist in nature to ensure that all specifications are included in the design phase. The design EMPr phase requires ongoing and in-depth discussions between the final design team and the environmental control officer. The engineer will have to cost for, and be available for, ongoing discussions with the environmental officer at all stages of final design.

The majority of the work is undertaken at a desktop level and thus impacts are negligible and will not be discussed in further detail.

1.1.2. Construction EMPr

The Construction EMPr details the environmental management system/framework within which construction activities will be governed for the Construction Phase. The Construction EMPr consists of various actions, initiatives and systems that the contractor will have to ensure are in place and are undertaken. The Construction EMPr consists of both a management system and environmental specifications which contain detailed specifications that will need to be undertaken or adhered to by the contractor.

The Construction EMPr will need to be developed in parallel with the Final Design Stages, and constructive input should be invited from the selected contractor. Sound environmental management is orientated around a pragmatic, unambiguous but enforceable set of guidelines and specifications, and for this reason it is imperative that the contractor, while being bound by the EMPr, fully understands it and has had input into its final development. For this reason the final construction EMPr will need to be signed off after input from the selected contractor prior to the initiation of construction activities. It should, however, be noted that the contractor must tender on the existing document and that in areas of uncertainty, a precautionary approach to the environmental guidelines and specifications must be adopted.

1.1.3. Operational and Maintenance EMPr

The operational phase EMPr provides specific guidance related to operational activities associated with a particular development. Operational EMPr's are sometimes referred to as Environmental Management Systems (EMS).

Impacts during the operational phase of a development of this nature will be few in number and low in intensity. By taking pro-active measures during the construction phase, potential environmental impacts emanating during the operational phase will be minimised. Monitoring of certain issues such as the success of vegetation re-establishment and erosion control will be required to continue during operation.

The final Operational EMPr should be developed in conjunction with any other relevant stakeholders prior to the adoption thereof.

1.2. Contents of the Environmental Management Programme (EMPr)

The contents of the *Environmental Management Programme (EMPr)*, as it is defined the EIA Regulations published as Government Notice (GN) No R. 982 of 4 December 2014 in terms of Chapter 5 of the National Environmental Management Act No 107 of 1998 (NEMA), must be consistent with requirements included in Appendix 4 of the Regulations (Table 1.1)

Table 1.1: Contents of an EMPr

EMPr REQUIREMENTS ACCORDING TO APPENDIX 4 OF GNR 982 OF 2014		SECTION OF REPORT
1	An EMPr must comply with section 24N of the Act and include-	
	a. Details of:	Section 3.5
	i. the EAP who prepared the EMPr; and	
	ii. the expertise of that EAP to prepare an EMPr, including a curriculum vitae.	Annexure 3
	b. a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Chapter 3
	c. a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Figure 3.1 – Figure 3.3; Annexure 4
	d. a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	
	i. Planning and design	Chapter 4
	ii. Pre-construction activities	
	iii. Construction activities	
	iv. rehabilitation of the environment after construction and where applicable post closure; and	
	v. where relevant, operation activities;	
	e. a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Chapter 6
	f. description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -	
	i. avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Section 3.2 – Section 3.4 and Chapter 5
	ii. comply with any prescribed environmental management standards or practices;	
	iii. comply with any applicable provisions of the Act regarding closure, where applicable; and	
	iv. comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	
	g. the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Chapter 5 and Chapter 6
	h. the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	
	i. an indication of the persons who will be responsible for the implementation of the impact management actions;	Table 6.1
	j. the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	
	k. the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 5.4
	l. a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 5.4 and Chapter 6
	m. an environmental awareness plan describing the manner in which-	
	i. the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Chapter 8
	ii. risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
	n. any specific information that may be required by the competent authority.	Nothing specified at this stage

Provided in the chapters that follow is the EMPr for the proposed development, based on the requirements of Regulation 33 of the EIA Regulations (GNR 982) as detailed above.

1.3. Basic Assessment Issues and Mitigation Measures

The identification and significance of identified project related impacts (before and after mitigation) is presented in the Basic Assessment Report (BAR). The BAR identified potential impacts and risks associated with the proposed development and these, contained in this EMPr, presents the preliminary actions, specifications and management commitments that need to be adhered to in order to mitigate or enhance the impacts of significance. These are detailed in the sections that follow.

2. DEFINITIONS

For the purposes of this EMP, the following definitions and abbreviations shall apply:

Alien Vegetation: Alien vegetation is defined as undesirable plant growth which shall include, but not be limited to all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable. This includes plant species identified as Alien and invasive species in the National environmental Management Biodiversity Act of 2004, Alien and Invasive Species Regulations, 2014.

Cement laden water: Means water containing cement or concrete arising from the Contractor's activities.

Contaminated water: Means water contaminated by the Contractor's activities such as with hazardous substances, hydrocarbons, paints, solvents and runoff from plant, workshop or personnel wash areas but excludes water containing cement/ concrete or silt.

Construction Camp: Construction camp (site camps) refers to all storage and stockpile sites, site offices, container sites, workshops and testing facilities and other areas required undertaking construction activities.

Environment: Environment means the surroundings within which humans exist and that could be made up of:-

- The land, water and atmosphere of the earth;
- Micro-organisms, plant and animal life;
- Any part or combination of (i) and (ii) and the interrelationships among and between them; and
- The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Aspect: An environmental aspect is any component of a contractor's construction activity that is likely to interact with the environment.

Environmental Authorisation (EA) (formerly known as, Record of Decision): A written statement from the relevant environmental authority, with or without conditions, that records its approval of a planned undertaking to construct the proposed infrastructure and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract.

Environmental Control Officer (ECO): A suitably qualified and experienced person or entity appointed for the construction works, to perform the obligations specified in the EA.

Environmental Site Officer (ESO): An ESO is the site-based designated person responsible for implementing the environmental provisions of the construction contract and is appointed by the service provider that carries-out construction activities.

Environmental Impact: An impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of a construction activity. An impact may be the direct or indirect consequence of a construction activity.

Environmental Impact Assessment: The process of examining the environmental effects of a development. The assessment requires detailed/specialist studies of significant issues that have been identified during the environmental scoping.

Environmental Management Programme: An environmental management tool used to ensure

that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced.

Environmental Management System: The internationally accepted and recognized environmental management system (EMS) which enables companies, organizations and operations to systematically manage, prevent and reduce environmental problems and associated costs. In terms of ISO 14001 and EMS is defined as, “*that part of the overall management system includes organizational structure, planning activities, responsibilities, procedures, processes and resources for developing, implementing, reviewing and maintaining the environmental policy.*”

Environmental Policy: A statement by the organisation of its intentions and principles in relation to its overall environmental performance which provides a framework for action and for the setting of its environmental objectives and targets.

External Auditor: A suitably qualified and experienced independent expert as per the required auditor qualifications (ISO 14012).

His: Means his or her, as applicable.

Independent Environmental Consultant: A suitably qualified and experienced independent environmental consultant (IEC) appointed by the Engineer to perform the obligations specified in the Contract. The IEC shall provide reports to the regulatory authority, the Engineer and any other parties as specified by the regulatory authority.

Interested and Affected Party (I&AP): Refers to an I&AP party contemplated in section 24(4)(d) of the NEMA (1998, Act No. 107) and which, in terms of that section, includes –

- a) *Any person, groups of persons, organisation interested in or affected by an activity, and;*
- b) *Any organ of state that may have jurisdiction over any aspect of the activity.*

ISO 14001 Environmental Management System (ISO 14001): The internationally accepted and recognised Environmental Management System as reflected in the document SABS ISO 14001: 1996.

Method Statement: Is a written submission by the Contractor to the ECO in response to the EMPr or to a request by the ECO, setting out the plant (construction equipment), materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the ECO when requesting the Method Statement. The Method Statement shall be in such detail that the ECO is able to assess whether the Contractor's proposal is in accordance with the EMPr and/or will produce results in accordance with the EMPr.

Mitigate: The implementation of practical measures to reduce the adverse impacts, or to enhance beneficial impacts of a particular action.

No-Go Area: Areas where construction activities are prohibited.

Pollution: According to the NEMA (Act No. 107 of 1998), pollution can be defined as, “*Any change in the environment caused by (i) substances; (ii) radioactive or other waves; or (iii) noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future*”.

Potentially hazardous substance: Is a substance, which, in the reasonable opinion of the ECO, can have a deleterious effect on the environment. Hazardous Chemical Substances are defined in the Regulations for Hazardous Chemical Substances published in terms of the Occupational Health and Safety Act.

Reasonable: Means, unless the context indicates otherwise, reasonable in the opinion of the ECO, after he has consulted with ESO.

Rehabilitation: To re-establish or restore to a healthy, sustainable capacity or state.

Silt laden water: Means water containing sand and silt arising from the Contractor's activities and/or as a result of natural run-off.

Site: The area in which construction is taking place.

Solid waste: Means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

Species of Special Concern: Those species listed in the rare, indeterminate, or monitoring categories of the South African Red Data Books, and/or species listed in globally near threatened, nationally threatened or nationally near threatened categories (Barnes, 1998).

Threatened species: Threatened species are defined as: a) species listed in the endangered or vulnerable categories in the revised South African Red Data Books or listed in the globally threatened category; b) species of special conservation concern (i.e. taxa described since the relevant South African Red Data Books, or whose conservation status has been highlighted subsequent to 1984); c) species which are included in other international lists; or d) species included in Appendix 1 or 2 of the Convention of International Trade in Endangered Species (CITES).

Topsoil: The top 100 mm of soil and may include top material e.g. vegetation and leaf litter.

3. BACKGROUND INFORMATION

3.1. Project Information

The Airports Company of South Africa (ACSA) has proposed the construction of a filling station on a portion of the Farm Witkoppie 64-IR Portion 187 and Portion 197 within the OR Tambo International Airport precinct. The development will consist of a four island forecourt canopy, a $\pm 250\text{m}^2$ convenience shop and a $\pm 130\text{m}^2$ fast food outlet. These facilities will be built on a $\pm 3000\text{m}^2$ site located southwest of the airport (Figure 3.1). EOH Coastal & Environmental Services have been appointed to undertake the Basic Assessment process for the proposed development. Detailed locality and layout maps are included below as Figure 3.2 and Figure 3.3.



Figure 3.1: Google Earth image showing the location of the proposed ACSA filling station.

The activity falls within the jurisdiction of the Ekurhuleni Metropolitan Municipality of the Gauteng Province. The proposed filling station site will have access to Jones Street and will serve both directions of traffic-flow. It will be the only filling station between the OR Tambo airport, the R21 and the N12 freeway. It will serve some transient traffic on Jones Street travelling between Boksburg and Kempton Park as well as the local industrial, office and casino traffic. Due to the lack of filling stations east of the R21 the existing market currently has to fill up elsewhere.

The proposed scope of activities will, in general, cover the following:

- The development of a convenience store, offices and change room facilities;
- The installation of four new underground fuel tanks with a total capacity of 115m^3 ;
 - 1 x 46m^3 unleaded petrol tank;
 - 1 x 23m^3 unleaded petrol tank;
 - 1 x 23m^3 lead replacement petrol tank;
 - 1 x 23m^3 diesel tank.
- The tanks will be composite fibre glass tanks manufactured according to SANS code 1535;
- The tanks will be installed to depths of 3.2m below the surface;
- The tanks will be placed on a high density polyethylene (HDPE) liner within the excavation;
- The tanks will be directly filled at filler points that will be located north of the underground tanks;

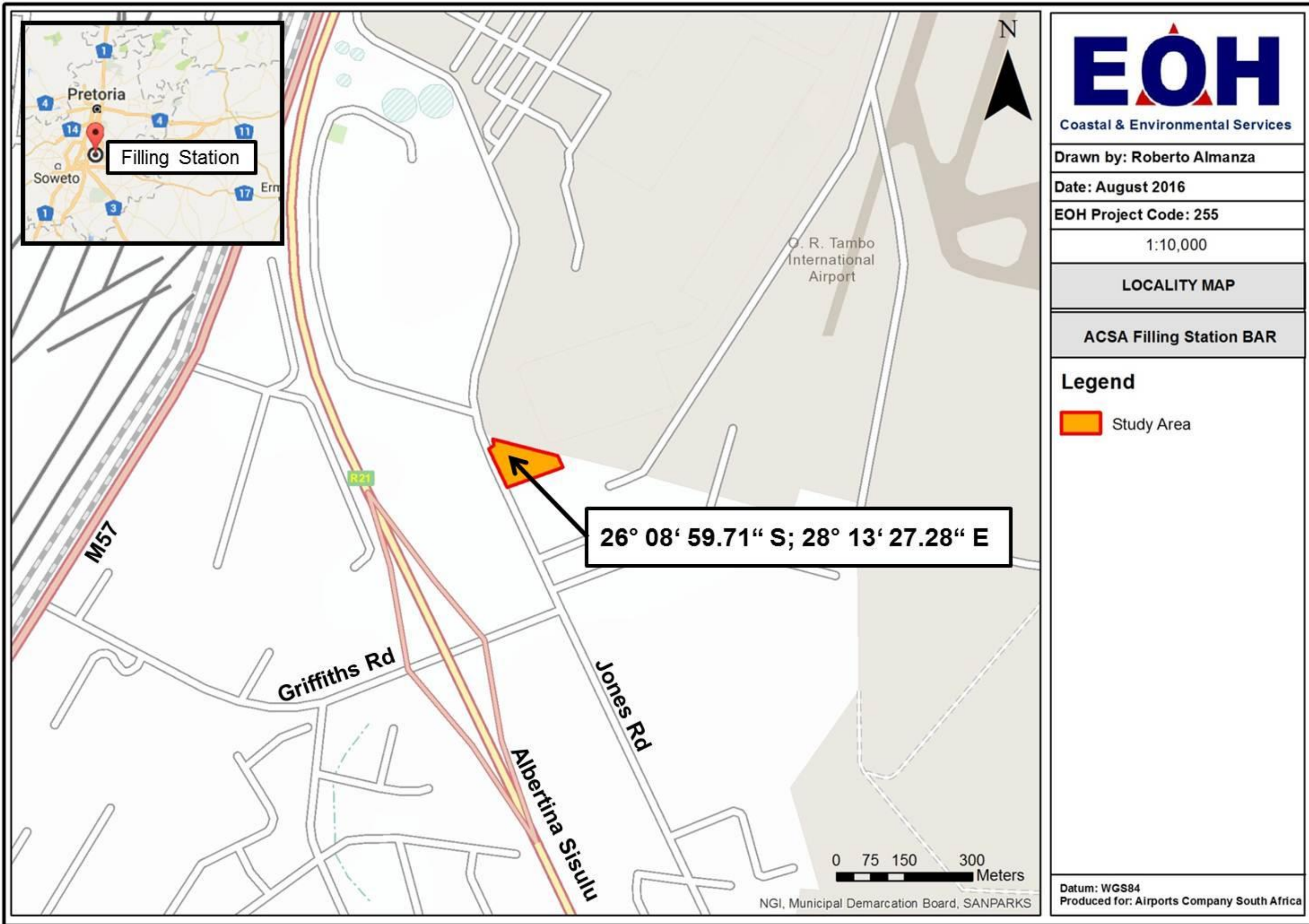


Figure 3.2: Locality map of the proposed filling station on Jones Road, within the Ekurhuleni Metropolitan Municipality.

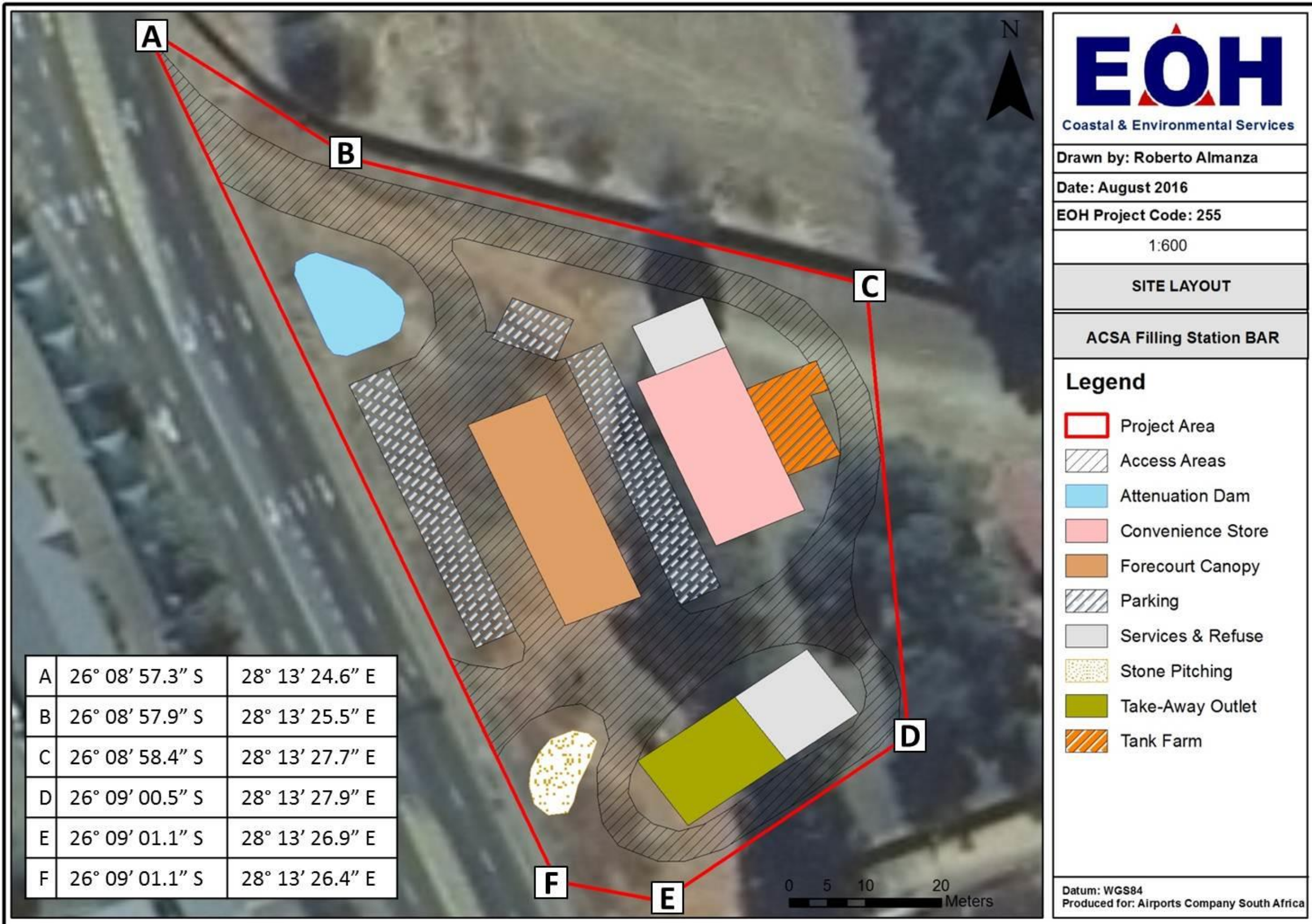


Figure 3.3: Site layout of the proposed filling station on Jones Road, within the Ekurhuleni Metropolitan Municipality.

- The filler points will be located underground in sealed manholes, which are designed to contain any accidental spills;
- Monitoring wells will be installed at the edge of the tank farm and inserted 0.5m below the base of the tanks and slotted to the first 0.6 m from the base upwards;
- The forecourt will have a drainage system that will discharge to the sewerage through the separator pit;
- The separator pit will be installed onsite, northeast of the underground tanks.

The proposed development does not require any additional access roads to be constructed however, on-site roads will be laid as per the design specifications. The site will then be accessible to the public via two entrances. One access point will be built at the intersection of Jones Road and the entrance to Jan Smuts Park and can be utilised from any direction of traffic. The other access point will be 100m further north along Jones road and can be utilised in a southerly direction. Roads will be appropriately upgraded and marked and traffic lights implemented to manage the traffic in this area. The filling station will have sufficient customer parking which will also be marked accordingly.

Water required for the construction and operation of the proposed development will be acquired from the Ekurhuleni Metropolitan Municipality. The onsite ablution facilities will connect to the municipal sewerage system and solid waste will be collected by the municipal waste removal system on a weekly basis. Electricity supply will be obtained from the existing Eskom service lines and will be derived from the National Grid. A stormwater servitude will be constructed along the western portion of the site and a 330m³ attenuation dam will be constructed in the north-west corner of the study area to collect stormwater runoff.

ACSA will not be undertaking the construction or the operation of the site, but instead will be placing a tender for the detail design, construction and operation of the filling station. ACSA will, after completion of the construction, pay for the improvements and enter into a management agreement with a petrol filling station operator for an approximately 20 year period.

3.2. The Environmental Policy

The contractor is required to compile an Environmental Management Policy, which must consider the following:

- The contractor's mission, vision and core values;
- Guiding principles;
- Requirements of, and communication with I&APs;
- The environmental specifications and intentions of the specifications must be upheld;
- The need to work towards continual improvement;
- The obligation to prevent pollution and ecological degradation;
- The importance of coordination with other organisational policies (e.g. quality, occupational health and safety, etc.);
- Site activities will be conducted in a manner that does not create a nuisance, risk or hazard to the natural environment;
- Reference to specific local and/or regional conditions;
- Employee and public health and safety must be considered a priority;
- A commitment to compliance with relevant environmental laws, regulations, by-laws and other criteria to which the contractor subscribes.

The contractor (contractor is defined as principal contractor, sub-contractors and any employees retained on this project) is required to be familiar with the environmental policy (to be developed by the applicant) and all that it implies, and to adopt and implement the policy throughout the course of construction. The policy must be communicated to all employees (and sub-contractors) of the contractor, and made available to the public, if requested.

3.3. Environmental Objectives and Targets

In order to meet the commitments detailed within the Environmental Management Policy, as well as those included within the environmental specifications of this EMP, the contractor shall develop environmental objectives and targets. The objectives and targets must conform to, and comply with, the following criteria:

- The objectives and targets shall constitute the overall goals for environmental performance identified in the environmental policy and strategy;
- When establishing objectives and targets, the contractor shall take into account the identified environmental aspects and associated environmental impacts, as well as the relevant findings from environmental reviews and audits;
- The targets must be set to achieve objectives within a specified timeframe;
- Targets should be specific and measurable;
- When the objectives and targets are set, the contractor must establish measurable Key Performance Indicators (KPIs). The latter will be used by the contractor as the basis for an Environmental Performance Evaluation System, and can provide information on both the environmental management and the operational systems;
- Objectives and targets need to apply broadly across the contractor's operations, as well as to site-specific and individual activities;
- Objectives and targets must be reviewed from time to time in view of changed operational circumstances and/or changes in environmental legal requirements, and need to take into consideration the views of the I&APs.

3.4. Environmental Legislation and Guidelines

The Contractor must ensure that all South African legislation concerning the natural environment, pollution and the built environment is strictly enforced. Such legislation must include, but is not limited to the:

- The Constitution of the Republic of South Africa Act No. 108 of 1996.
- National Environmental Management Act No. 107 of 1998 as amended.
- National Heritage Resources Act, No 25 of 1999.
- National Environmental Management: Biodiversity Act 10 of 2004
- National Environmental Management: Air Quality Act 39 of 2004
- National Environmental Management: Waste Management Act 59 of 2008
- The Environment Conservation Act No 73 of 1989
- National Water Act, No 36 of 1998
- National Forest Act, No 84 of 1998
- Occupational Health and Safety Act 85 of 1993
- Provincial Nature Conservation Ordinance of 1974
- National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004) – Alien and Invasive Species (AIS) Regulations
- All relevant provincial legislation, Municipal by-laws and ordinances

3.5. Details of EAP

EAP: Dr Eric Igbinigie
Company: EOH Coastal & Environmental Services (CES)
Physical Address: 1 Osborne Lane, EOH Business Park, Bedfordview
Postal Address: 1 Osborne Lane, EOH Business Park, Bedfordview
Telephone: +27 (11) 607 8389
Fax: +27 (11) 616 9929
Website: www.cesnet.co.za
Email: e.igbinigie@cesnet.co.za

EOH Coastal & Environmental Services (EOH CES) was established in 1990, and is an independent specialist environmental consultancy with offices in Grahamstown, Port Elizabeth, East London, Cape Town, Johannesburg and a satellite office in Maputo, Mozambique. Our principal area of expertise is in assessing the impacts of development on the natural, social and economic environments through, among other instruments, the environmental impact assessment process, and in so doing contribute towards sustainable development.

We adopt a scientific approach to our studies, underpinned by an informed and holistic view of the environment and a pragmatic approach to sustainable development. We believe that a balance between development and environmental protection can be achieved by skilful and careful planning. Our success rate in achieving this balance in a variety of approved developments is evidence of our capability. Our staff is usually comprised of between 30 to 35 consultants and 11 support staff. All our staff is well qualified in the biological, social and environmental sciences, and produce scientifically robust, defensible reports and EIAs.

In addition, EOH CES has a number of permanent associates that can be drawn on to provide additional expertise, including Rivers for Africa (who specialise in the determination of environmental water requirements), and Nomad Consulting (who specialise in social impact assessments and resettlement action plans). We also have well-developed working relationships with a number of other specialist consulting companies who provide expertise in areas such as air quality emission studies, visual impacts, noise impacts, heritage assessments, radiation hazard assessments, and soil and agricultural assessments.

Dr Eric E Igbini (*Role: Project Management and Report Review*)

Eric is a Senior Environmental Consultant and a registered Professional Natural Scientist (Pr.Sci.Nat.). Eric holds a PhD in Environmental Biotechnology and his professional interest is in Sustainable Integrated Environmental Management with a keen interest in Waste & wastewater specialist assessment, Environmental due diligence, Contamination assessment and remediation, and Environmental & Social compliance audits. Eric has successfully conducted several related local and international environmental projects across Africa in compliance with the requirements of Equator Principles Financial Institutions including the IFC, SWEDFUND, DEG and AfDB, where he served as both specialist consultant and project manager. Before joining CES Eric served as a Senior Research Scientist at the Institute for Environmental Biotechnology, Rhodes University conducting postgraduate lectures and led a research group tasked with the successful beneficiation of coal spoils, facilitating the re-vegetation of coal mine dump sites evident in Witbank, South Africa.

Mr Gideon Raath (*Role: Project Management*)

Gideon holds an MSc (Geography and Environmental Management; SU), a BSc Honours (Ecology and Environmental Studies - Cum laude; Wits) and a BSc (Geography and Environmental Management; UJ). His MSc thesis focussed on the hydrological impact on the spatial distribution of invasive Eucalyptus trees along the Breede River, while his honours thesis evaluated ethnobotanical relationships around the Rio Tinto copper mine in Phalaborwa. Most recently he has worked Monitoring & Evaluation Project Manager for the City of Cape Town's invasive species unit. Gideon works from the Cape Town office, and is interested in invasion ecology and the management of groundwater pollution through phytoremediation.

Mr Roberto Almanza (*Role: Report Production*)

Roberto obtained his BSc (Environmental Sciences) majoring in Geology and Geography from Nelson Mandela Metropolitan University and went on to complete his BSc Honours in Geology. Roberto is currently undertaking his MSc (Geology). While Roberto's academic experience is mostly in structural and economic geology, he has also worked as a consultant on a number of exploration projects across South Africa.

4. IMPACT ASSESSMENT AND MITIGATION SUMMARY

This section provides an assessment of the pre-mitigation significance as well as the post-mitigation significance of the social and environmental impacts that may result from the major activities associated with the development.

4.1. Summary of Impacts Associated with the Development

The table below shows the significance of the impacts after mitigation is taken into account:

IMPACT	WITHOUT MITIGATION	WITH MITIGATION	NO-GO
Construction Phase			
1. Biodiversity Impacts	Negligible	LOW +	LOW –
2. Soil Compaction and Erosion	MOD –	LOW –	LOW –
3. Stormwater and Groundwater Contamination	HIGH –	LOW –	NA
4. Solid Waste Generation	MOD –	LOW –	NA
5. Impacts on Cultural Heritage, Archaeology and Palaeontology	LOW –	Negligible	LOW –
6. Air Pollution	MOD –	LOW –	LOW –
7. Noise	Negligible	Negligible	MOD –
8. Visual Impacts	LOW –	Negligible	LOW –
9. Traffic Impacts	MOD –	LOW –	LOW –
10. Health and Safety Risks	MOD –	LOW –	NA
11. Employment Creation	MOD +	MOD +	NA
12. Security Risks	HIGH –	LOW –	NA
13. Purchasing of Materials from Local Businesses	MOD +	MOD +	NA
Operational Phase			
14. Stormwater and Groundwater Contamination	HIGH –	MOD –	NA
15. Solid Waste Generation	MOD –	LOW –	Negligible
16. Sewerage and Wastewater Generation	MOD –	LOW –	LOW –
17. Hazardous Waste Generation	HIGH –	LOW –	NA
18. Increased Stormwater Runoff and Erosion Potential	MOD –	LOW –	LOW –
19. Air Pollution	HIGH –	MOD –	MOD –
20. Noise	LOW –	Negligible	MOD –
21. Visual Impacts	LOW –	LOW –	LOW –
22. Traffic Impacts	MOD –	LOW –	MOD –
23. Health and Safety Risks	HIGH –	LOW –	NA
24. Employment	MOD +	MOD +	MOD –
25. Increase Consumer Choice and Convenience	MOD +	MOD +	MOD –
26. Economic Benefits	MOD +	MOD +	LOW –

4.2. Summary of Mitigation Measures

Construction Phase	
Impact 1: <u>Biodiversity Impacts</u>	<ul style="list-style-type: none"> An Alien Invasive Control Programme must be implemented during construction and operation. Care should be taken during construction to not spread seed into and from site through earth works. An Alien Invasive Control Programme must be implemented.
Impact 2: <u>Soil Compaction and Erosion</u>	<ul style="list-style-type: none"> Newly cleared and exposed areas must be promptly rehabilitated to avoid soil erosion; Where necessary, temporary stabilization measures must be used; Plan for the worst case, that is, for heavy rainfall and runoff events,

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	<p>or high winds;</p> <ul style="list-style-type: none"> • Appropriate erosion control measures must be implemented and a monitoring programme established to ensure that no erosion is taking place. At the first sign of erosion the necessary remedial action must be taken; • Care must be taken to ensure that runoff is well dispersed so as to limit erosion.
<p><u>Impact 3:</u> <u>Stormwater and Groundwater Contamination</u></p>	<ul style="list-style-type: none"> • Establish a dedicated area for material stockpiling away from the existing stormwater drainage system; • Establish a site office with a dedicated area for construction vehicles to refuel and where cement can be mixed; • Vehicle re-fuelling and cement mixing must only take place on impervious surfaces; • Ensure that all construction machinery is in good working order to prevent oil leaks; • Construction hoses should be checked for leaks on a daily basis; • Temporary chemical toilets must be provided (separate toilets for males and females) for the duration of the construction period if no waterborne sewerage system is available. These toilets must be made available for all site staff during the construction phase; • The developers must appoint and enter into a contract with a qualified third party service provider for the maintenance of the sanitation system; • If toilets are not mobile they should have a concrete base and be tied down to avoid spillages etc.; • Sanitary bins should be made available for female staff. • Adequate waste disposal (litter) bins must be available on site. These must be properly secured and covered to prevent scavengers from tipping them; • Any hazardous materials that need to be stored on site must be done so under lock and key. Surfaces must be bunded so that any excess water or spilled fuel can be trapped and stored in a container for disposal.
<p><u>Impact 4:</u> <u>Solid Waste Generation</u></p>	<ul style="list-style-type: none"> • Rubble and other construction waste produced should be re-used if possible and, where it is not possible, must be disposed of at the nearest registered waste disposal facility; • Rubble, which will not be reused, must be removed from site on a regular basis; • If rubble is stored on site, it should be stored on designated portions of land away from the road; • Litter must be controlled during construction – adequate bins must be made available on site at all times. These must be made scavenger and weather proof and must be emptied on a regular basis; • Construction materials stored at the site camp must be secured – i.e. plastics must be covered to prevent being blown off site; • The construction area must remain litter free and regular inspections for litter must be conducted. The activity should not contribute to any surrounding windblown litter; • Skips must be covered and emptied regularly; • Waste manifests must be provided by the municipality to prove legal disposal; • Cement bags must be kept in a sealed container; • Waste must not to be buried or burned. • Waste may not be removed from site by staff or members of the public.

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<p><u>Impact 5:</u> <u>Impacts on Cultural Heritage, Archaeology and Palaeontology</u></p>	<ul style="list-style-type: none"> • Should any archaeological or cultural sites or objects be located during the construction of the proposed project, it should immediately be reported to the South African Heritage Resources Agency (SAHRA). Failure to report a site or object of archaeological and/or cultural significance is a contravention of the National Heritage Act (Act No. 25 of 1999); • All construction site staff should be briefed to immediately report any sites or objects, which are located during the construction of the facility. In the event of finding what appears to be an archaeological site or a cultural and/or historic site or object, work should be terminated until a qualified archaeologist or historian can examine the item.
<p><u>Impact 6:</u> <u>Air Pollution</u></p>	<ul style="list-style-type: none"> • Topsoil should be cleared in a phased manner to avoid large areas of bare ground; • Employ dust suppression measures such as wetting of the project area during dry, windy periods (Only water from a licensed source will be used); • Where practical, do not leave large cleared areas exposed for longer than necessary; • The area of disturbance must be kept to a minimum at all times; • No unnecessary clearing of vegetation, digging or scraping should occur; • Vehicle speed should be limited to the lowest possible, and should not exceed 40km/h on the construction site. • Construction vehicles must be regularly maintained in order to ensure that no unnecessary exhaust fumes are being emitted.
<p><u>Impact 7: Noise</u></p>	<ul style="list-style-type: none"> • No construction activities may take place between sunset and sunrise; • Machinery that generates noise must be regularly maintained in order to ensure that no unnecessary additional noise is produced; • Equipment with lower sound levels should be selected where feasible; • No construction activities after 13:00 on Saturdays, Sundays and public holidays.
<p><u>Impact 8:</u> <u>Visual Impacts</u></p>	<ul style="list-style-type: none"> • Employ techniques to suppress dust and smoke generation during construction; • The contractor should maintain good housekeeping on site to avoid litter and minimise waste; • Night lighting of the construction sites should be minimised within requirements of safety and efficiency; • Fires and fire hazards need to be managed appropriately.
<p><u>Impact 9:</u> <u>Traffic Impacts</u></p>	<ul style="list-style-type: none"> • Large construction vehicles must not be permitted to utilize public roads during peak hours (AM: 06:30 – 08:30 and PM: 16:00 – 18:30); • Damages to public roads caused by large construction vehicles must be repaired immediately.
<p><u>Impact 10:</u> <u>Health and Safety Risks</u></p>	<ul style="list-style-type: none"> • All relevant Health and Safety legislation as required in South Africa should be strictly adhered to, including but not limited to the Occupational Health and Safety Act, 1993 (No. 85 of 1993); • Smoking should be prohibited in the vicinity of flammable substances; • Ensure the availability of sufficient firewater tie-in points; • Any welding or other sources of heating of materials should be done in a controlled environment and under appropriate supervision; • Ensure availability of fire extinguishers;

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	<ul style="list-style-type: none"> • All employees must be aware of emergency/ contingency plans to ensure an understanding of the hazards and procedures required during an emergency situation; • An emergency preparedness and response plan must be implemented for the duration of construction; • Records of environmental and/or health and safety related incidents should be maintained and communicated to the relevant persons; • During construction the site shall be fenced off to prevent access; • Fencing shall be inspected weekly and maintained properly, by the Contactor, until construction is complete; • The Contractor shall ensure that signage, which should be pictorial and in the vernacular, is erected on all boundary fences warning against entering the construction area; • Traffic calming and speed control measures for access to construction sites shall be instigated in consultation with the local authorities.
<p><u>Impact 11:</u> <u>Employment Creation</u></p>	<ul style="list-style-type: none"> • No measures required.
<p><u>Impact 12:</u> <u>Security Risks</u></p>	<ul style="list-style-type: none"> • No unauthorized persons should be allowed onto the site and site access should be strictly controlled. • Unsocial activities such as consumption or illegal selling of alcohol, drug utilisation or selling of any items on site, are prohibited. • Any persons found to be engaged in such activities shall have disciplinary and / or criminal action taken against them. • No person shall enter the site unless authorised to do so by the contractor, Project Coordinator or ECO. All visitors must report to the site office on arrival, undergo induction training, sign an indemnity form and be in possession of the correct PPE clothing to wear while on site. • Induction programmes must communicate the rules and regulations to be adhered to on site to all persons entering the site. NO person may remain on site without having first completed induction training. • If any fencing interferes with the construction process, such fencing shall be deviated until construction is completed. The deviation of fences shall be negotiated and agreed with the landowner in writing by the ECO. • Trespassing on private / commercial properties adjoining the site is forbidden. • The site must be secured in order to reduce the opportunity for criminal activity in the locality of the construction site • No drugs, alcohol, fire arms or weapons of any kind allowed on site (barring medication); • No hunting, trading or selling of items of any kind allowed on or near site; • Intoxication while on site will not be allowed. If necessary, breathalysing may be instigated for staff members.
<p><i>Operational Phase</i></p>	
<p><u>Impact 13:</u> <u>Purchasing of Materials from Local Businesses</u></p>	<ul style="list-style-type: none"> • No measures required.
<p><u>Impact 14:</u> <u>Stormwater and Groundwater Contamination</u></p>	<ul style="list-style-type: none"> • A site specific spill contingency plan for the operation and transportation of fuel must be compiled and implemented; • Monitoring of volumes of the underground storage tanks must take place on a daily basis to detect unexplained losses due to leakages;

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	<ul style="list-style-type: none"> • The condition of the tanks, associated piping and the monitoring wells must be inspected on a regular basis; • Integrity testing of the tank must take place 5 years after installation, with repetition on a 5-year cycle thereafter; • At the end of the life span of the tanks, as governed by the supplier specification, tanks are to be replaced; • All waste oils, greases, fuels, chemicals etc. should be collected and disposed of in an appropriate manner off site. The contents of grease traps or other waste oil, grease and/ or fuel disposal/ storage containers should under no circumstances be emptied and dumped to the surrounding area. • No fuels/ oils must be allowed to discharge directly into stormwater pipes or drains and sewage manholes/pipes; • The clean water (e.g. surface runoff) and dirty water (e.g. contaminated water from the forecourt and filling points) must be separated to prevent contaminated run-off from entering the stormwater, groundwater and soil; • The forecourt area and the filling points should be concreted and graded so that any effluent run-off will not flow to the street, or into stormwater/ sewer systems but pass through the oil water separator sump/s before discharge into the sewer system; • The oil/ water separator sump/s must be checked regularly and kept clean to prevent blockage and overflow. In addition, regular monitoring and clearing of the oil/ water separator sump/s will prevent hydrocarbon liquids from discharging into the sewer/ stormwater systems. Waste from the separator must be disposed of at a suitable waste handling site where Safe Disposal Certificates will be issued.
<p><u>Impact 15:</u> <u>Solid Waste</u> <u>Generation</u></p>	<ul style="list-style-type: none"> • Adequate waste disposal (litter) bins must be available on site. These must be properly secured and covered to prevent scavengers from tipping them; • A responsible person must be appointed to manage the solid waste generated at the filling station in order to ensure that it is properly stored and refused regularly by municipal refuse services. • Sufficient refuse collection must occur to ensure no build-up of refuse occurs on site.
<p><u>Impact 16:</u> <u>Sewerage and</u> <u>Wastewater</u> <u>Generation</u></p>	<ul style="list-style-type: none"> • Waste water and effluent management must be implemented on site; • Ablution facilities and associated piping must be adequately lined and checked for leaks on a regular basis. • All sewage generated from the site must be discharged into the Municipal sewerage reticulation system.
<p><u>Impact 17:</u> <u>Hazardous Waste</u> <u>Generation</u></p>	<ul style="list-style-type: none"> • Paved surfacing coming in contact with vehicles must be bunded such that stormwater flows into an oil/water separator, to allow for treatment of hydrocarbons and other hazardous wastes. • Hazardous substances should be disposed of at an appropriate classified waste site (unless it is to be recycled by approved methods), as per the National Environmental Management Waste Act 59 of 2008; • Sludge from the oil separators must be disposed of to a suitable waste-handling contractor where Safe Disposal Certificates are to be issued; • All product spills within the bunded area must be appropriately cleaned up; • All contaminated spill fighting material such as fibres, soil, sandbags, etc. must be disposed of in an appropriate hazardous

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	<p>waste landfill site. Proof of this must be made available upon request;</p> <ul style="list-style-type: none"> • Ensure safe disposal of Methanol/water mixture used for removal of any residual water from the fuel tanks; • Any spilt material must be disposed of at a suitable licensed waste disposal facility, with chain of custody documentation supplied as proof of end recipient; • The transportation, handling and storage of hazardous and flammable substances must comply with all the provisions of the Hazardous Substances Act 1973, (Act No. 15 of 1973) associated regulations as well as a SANS 10228 and SANS 10089 codes. • A site-specific stormwater management plan must be implemented to manage the increased stormwater runoff.
<u>Impact 18: Increased Stormwater Runoff and Erosion Potential</u>	<ul style="list-style-type: none"> • A site-specific stormwater management plan must be implemented to manage the increased stormwater runoff; • Storm-water structures need to be implemented as part of the development and must link up with the current storm-water infrastructure in order to navigate stormwater and minimise soil erosion; • At the first signs of erosion, the correct procedures must be undertaken to manage, resolve and prevent it from occurring.
<u>Impact 19: Air Pollution</u>	<ul style="list-style-type: none"> • Stage 1 Volatile Organic Compound (VOC) Vapour Recovery Systems, should be installed onto fuel dispensing nozzles at the refuelling and forecourt areas; • Operators must ensure that every effort is made to limit gaseous emissions; • All equipment used must be manufactured to limit VOC vapour emissions; • Operational refuelling procedures must be put in place to limit vapour emissions during refuelling of vehicles and storage tanks.
<u>Impact 20: Noise</u>	<ul style="list-style-type: none"> • Workers must not produce any unnecessary noise e.g. no loud music to be played, no whistles to be used etc.; • The Ekurhuleni Metropolitan Municipality by-laws relating to noise must be adhered to at all times.
<u>Impact 21: Visual Impacts</u>	<ul style="list-style-type: none"> • Building finishes should be of appropriate design and quality; • Buildings should be designed in such a way that it fits into the surrounding industrial environment; • Waste must be removed from site regularly and disposed of at a registered landfill site in order to avoid unnecessary litter being viewed on site; • General good housekeeping must be maintained at all times.
<u>Impact 22: Traffic Impacts</u>	<ul style="list-style-type: none"> • The proposed external road upgrades and site access routes must be constructed in line with the relevant design standards; • Fuel tankers required on site must avoid peak hour traffic (AM: 06:30 – 08:30 and PM: 16:00 – 18:30); • Any damage to roads caused by fuel tankers must be reported to the municipality and repaired immediately; • All mitigation aspects referred to in the Traffic Access Study (WSP, 2013) must be adhered to fully.
<u>Impact 23: Health and Safety Risks</u>	<ul style="list-style-type: none"> • All relevant Health and Safety legislation as required in South Africa should be strictly adhered to, including but not limited to the Occupational Health and Safety Act, 1993 (No. 85 of 1993); • Smoking should be prohibited in the vicinity of flammable substances; • Ensure the availability of sufficient firewater tie-in points;

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	<ul style="list-style-type: none"> • Ensure availability of fire extinguishers; • All employees must be aware of emergency/ contingency plans to ensure an understanding of the hazards and procedures required during an emergency situation; • An emergency preparedness and response plan must be implemented for the operational phase; • Records of environmental and/or health and safety related incidents should be maintained and communicated to the relevant persons; • Fencing shall be inspected weekly and maintained properly, by the Contactor, until construction is complete; • Traffic calming and speed control measures for access to the site shall be instigated in consultation with the local authorities; • Kitchens must be fully equipped with necessary safety and fire-fighting equipment; • All staff to be trained in relevant health and safety aspects; • A qualified first-aider must be present on site at all times.
<p><u>Impact 24:</u> <u>Employment</u></p>	<ul style="list-style-type: none"> • None required.
<p><u>Impact 25: Increase consumer choice, convenience and service points.</u></p>	<ul style="list-style-type: none"> • None required.
<p><u>Impact 26:</u> <u>Economic Benefits</u></p>	<ul style="list-style-type: none"> • None required.

5. ENVIRONMENTAL MANAGEMENT SYSTEM

5.1. Reporting

5.1.1. Administration

Before the contractor begins each construction activity, the Contractor shall give to the ECO and engineer a written method statement setting out the following:

- The type of construction activity;
- Locality where the activity will take place;
- Identification of impacts that might result from the activity;
- Identification of activities or aspects that may cause an impact;
- Methodology and/or specifications for impact prevention for each activity or aspect;
- Methodology and/or specific actions for impact containment for each activity or aspect;
- Emergency/disaster incident and reaction procedures;
- Treatment and continued maintenance of impacted environment.

The contractor may provide such information in advance of any or all construction activities provided that new submissions shall be given to the ECO and/or engineer whenever there is a change or variation to the original.

The ECO and/or engineer may provide comment on the methodology and procedures proposed by the Contractor but he shall not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the contractor shall demonstrate at inception and at least once during the contract that the approved measures and procedures function properly.

5.1.2. Good housekeeping

The contractor shall undertake "good housekeeping" practices during construction. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods that leaves production in a safe state from the ravages of weather to include the care for and preservation of the environment within which the site is situated.

5.1.3. Record keeping

The engineer and the ECO will continuously monitor the contractor's adherence to the approved impact prevention procedures and the engineer shall issue to the contractor a notice of non-compliance whenever transgressions are observed. The ECO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the engineer in the monthly report. These reports shall be made available to the authorities when requested.

The Contractor shall ensure that an electronic filing system identifying all documentation related to the EMP is established.

A list of reports likely to be generated during all phases of the Project is provided below, and all applicable documentation must be included in the environmental filing system catalogue or document retrieval index.

- Environmental Management Programme;
- Final design documents and diagrams issued to and by the Contractor;
- All communications detailing changes of design/scope that may have environmental implications;
- Complaints register;

- Medical reports;
- Incident and accident reports;
- Emergency preparedness and response plans;
- Copies of all relevant environmental legislation;
- All relevant permits;
- All method statements from the Contractor for all phases of the project.

5.1.4. Document control

The Contractor and resident engineer shall be responsible for establishing a procedure for electronic document control. The document control procedure should comply with the following requirements:

- Documents must be identifiable by organisation, division, function, activity and contact person;
- Every document should identify the personnel and their positions, who drafted and compiled the document, who reviewed and recommended approval, and who finally approved the document for distribution;
- All documents should be dated, provided with a revision number and reference number, filed systematically, and retained for a five year period.

The Contractor shall ensure that documents are periodically reviewed and revised, where necessary, and that current versions are available at all locations where operations essential to the functioning of the EMP are performed. All documents shall be made available to the independent external auditor.

5.2. Construction phase

5.2.1. Clearing of the Site

In all areas where the contractor intends to, or is required to clear the natural vegetation and soil, either within the construction area, or at designated or instructed areas outside the construction area, a plan of action shall first be submitted to the engineer for his approval.

The EMP shall contain a photographic record and change/land reference of the areas to be disturbed. This shall be submitted to the engineer for his records before any disturbance/stockpiling may occur. The record shall be comprehensive and clear, allowing for easy identification during subsequent inspections.

The contractor shall be responsible for the re-establishment of grass within the development boundaries for all areas disturbed during construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for, or from, road construction has to be stored temporarily or otherwise within the construction area, or at designated or instructed areas outside the construction area. This responsibility shall extend until expiry of the defects notification period.

5.2.2. Excavation, hauling and placement

The contractor shall provide the engineer with detailed plans of his intended construction processes prior to starting any cut or fill or layer. The plans shall detail the number of personnel and plant to be used and the measures by which the impacts of pollution (noise, dust, litter, fuel, oil, sewerage), erosion, vegetation destruction and deformation of landscape will be prevented, contained and rehabilitated. Particular attention shall also be given to the impact that such activities will have on the adjacent built environment. The contractor shall demonstrate his “good housekeeping”, particularly with respect to closure at the end of every day so that the site is left in a safe condition from rainfall overnight or over periods when there is no construction activity.

5.2.3. Construction Activities and Equipment

- Construction will be restricted to normal daytime working hours (07:00 – 18:00);
- No construction activities will take place during weekday evenings and night-time (after 17:00), on Saturdays after midday (12:00) and the entire day on Sundays;
- All noise-making equipment shall be turned off when not in use;
- All equipment shall be kept in good working order;
- All equipment shall be operated within specifications and capacity (i.e. do not overload machines);
- Compliance with the appropriate legislation with respect to noise is mandatory;
- The Contractor will familiarise himself with, and adhere to, any local bylaws and regulations regarding the generation of noise;
- Construction staff should be given “noise sensitivity” training;
- The Contractor will endeavour to keep noise generating activities associated with construction activities to a minimum;
- Modern low noise emission vehicles and equipment shall be favoured on site. The details of all construction machinery and vehicles must be determined prior to construction in order to identify potentially noisy machinery and to seek possible alternatives. These details will include the manufacturer, type and noise emission data of each machinery/vehicle and how many will be used at any time. Note that manufacturers of modern vehicles and machinery provided for the international market are obliged to provide noise emission data. Where this information is not available, noise measurements must be conducted prior to use of such machinery or vehicles;
- A well planned and co-ordinated “fast track” procedure is implemented to complete the total construction process in the area in the shortest possible time.

5.2.4. Pedestrian and Traffic Safety

- During construction the site shall be fenced off to prevent access;
- Fencing shall be inspected weekly and maintained properly, by the Contractor, until construction is complete;
- The Contractor shall ensure that signage, which should be pictorial and in the vernacular, is erected on all boundary fences warning against entering the construction area;
- Traffic calming and speed control measures for access to construction sites shall be instigated in consultation with the local authorities.

5.3. Operation Phase

5.3.1. Health and safety

- All relevant Health and Safety legislation as required in South Africa should be strictly adhered to, including but not limited to the Occupational Health and Safety Act, 1993 (No. 85 of 1993);
- A certificate of registration must be applied for before the fuel product is placed in the fuel tanks;
- All necessary occupational certificates and inspections must be complied with to the approval of the Ekurhuleni Metropolitan Municipality;
- The applicant or persons in control of the facility must train safety representatives, managers and workers in workplace safety.

5.3.2. Emergency plan

- An emergency response plan (for construction and operation of the filling station and transportation of fuels) should be drawn up, to the approval of the Authorities, prior to construction and operation taking place;
- All pollution incidents must be reported immediately to the Authorities;

- Record(s) of environmental related incidents should be maintained and communicated to the ECO.

5.3.3. Safeguarding of the environment, local community and employees against fire risk

- Smoking should be prohibited in the vicinity of flammable substances;
- Ensure the availability of sufficient firewater tie-in points;
- Any welding or other sources of heating of materials should be done in a controlled environment and under appropriate supervision;
- Training must be provided in the use of the appropriate fire-fighting equipment;
- Ensure availability of fire extinguishers and fire-fighting equipment (SABS 089-1-1987);
- A close cooperation must be established with the local fire authority to ensure that they know the layout of the site, what equipment and facilities are available, where they are located, and how they are used; and
- All employees must be aware of emergency/ contingency plans to ensure an understanding of the hazards and procedures required during an emergency situation.

5.3.4. Spill contingency plan

- A site specific spill Contingency Plan (for construction, operation and the transportation of fuels) must be compiled, to the approval of the Authorities, prior to construction and operation taking place.

5.3.5. Refuelling of vehicles

- The forecourt area of and the filler points should be concreted and graded so that any effluent run-off will not flow to the street, or into stormwater or sewer systems, but pass through the oil water separator sump(s) before discharge into the sewer system;
- Shear-off valves must be positioned below dispensers so that no spillage occurs if the dispenser is knocked over.

5.3.6. Effluent handling/ storm water management

- The clean (e.g. surface runoff from the driveway) and dirty (e.g. contaminated water from the forecourt and filling points) water systems must be separated to prevent contaminated run-off from entering the surface water, groundwater and soil;
- All surface spillages must be contained on-site through channels and trenches and diverted to an appropriate oil or water separator system of sufficient capacity;
- No fuels or oils must be allowed to be discharged directly into stormwater pipes or drains and sewage manholes or pipes;
- All waste oils, greases, fuels, chemicals etc. should be collected and disposed of in an appropriate manner off site. The contents of grease traps or other waste oil, grease and/or fuel disposal or storage containers should under no circumstances be emptied and dumped to the surrounding area. Outflow must be directed to the municipal sewer system;
- During fuel tanker delivery, the tanker driver must be present at all times during product offloading.

5.3.7. Functioning of the separator pit

- Stormwater should be regularly tested before exiting the filling station site and before entering the bulk stormwater lines, to ensure that the quality of stormwater out-flow complies to General Limit Values of the National Water Act (No. 36 of 1998) (NWA). In this regard, the applicant will be required to install an approved monitoring system at an approved location;

- Impediments to natural water flow should be avoided wherever possible, or, if unavoidable, be allowed for in the design by means of appropriately sized and positioned drains, culverts etc. Provide separate systems for surface water and for water from contaminated sources (dispensing and filling areas).
- Manholes must project a minimum of 50mm above finished ground level to exclude the ingress of water;
- The oil/water separator sump(s) must be checked regularly and kept clean to prevent blockage and overflow. In addition, regular monitoring and clearing of the oil/water separator sump(s) will prevent hydrocarbon liquids from discharging into the sewer and stormwater systems;
- Waste from the separator must be disposed of at a suitable waste handling site where Safe Disposal Certificates will be issued;
- The Ekurhuleni Metropolitan Municipality must be contacted with regard to any discharge to the stormwater or sewer systems.

5.3.8. Hazardous substance management (spent chemicals, oils, paint, grease, cement, lubricants, soaps, fuel etc.)

- Hazardous substances should be disposed of at an appropriate classified waste site (unless it is to be recycled by approved methods), as per the National Environmental Management Waste Act 59 of 2008;
- Waste from the oil interceptors must be disposed of to a suitable waste-handling contractor where Safe Disposal Certificates are to be issued;
- All product spills within the bunded area must be appropriately cleaned up;
- All contaminated spill fighting material such as fibres, soil, sandbags, etc. must be disposed of in an appropriate hazardous waste landfill site. Proof of this must be made available upon request;
- Ensure safe disposal of methanol/water mixture used for removal of any residual water from the tank before commissioning;
- In the event of a spill, hazardous material may be generated. Such material must be disposed of at a suitable licensed waste disposal facility, with chain of custody documentation supplied as proof of end recipient;
- The transportation, handling and storage of hazardous and flammable substances must comply with all the provisions of the Hazardous Substances Act 1973, (Act No. 15 of 1973) associated regulations as well as a SANS 10228 and SANS 10089 codes;
- An integrated waste management approach that is based on waste minimisation must be used and should incorporate reduction, recycling, re-use and disposal where appropriate. Any solid waste shall be disposed of at a landfill licensed in terms of section 20 (b) of the National Management Waste Act, 2008 (Act No. 59 of 2008);

5.3.9. Fugitive air emissions

- All sample points must be enclosed and routed to drip tanks thus eliminating vapour within the facility;
- Stage 1 Volatile Organic Compound (VOC) Vapour Recovery Systems, as approved by the filling station operator, should be installed onto fuel dispensing nozzles at the refuelling and forecourt areas. The operator must ensure that every effort is made to limit gaseous emissions on their site and that all equipment used is manufactured to limit VOC emissions;
- The design must use canned pumps and welded fittings;
- Where required, double mechanical seals must be used;

5.4. Monitoring and Auditing

An independent ECO should be appointed to serve as an external auditor during the construction phase and, if necessary, for the first year of operation. This is to ensure that the EMP and other relevant requirements are complied with.

5.4.1. Product leak monitoring and design installation

1. All staff are to be given environmental awareness and health and safety training;
2. Monitoring of volumes of the underground storage tanks must take place on a daily basis to detect unexplained losses due to leakages. This should include dipping underground storage tank and reconciling them against volume to check for losses due to leakages;
3. In the event where discrepancies are identified, the problem will be investigated and attended to, with a rehabilitation plan compiled where necessary. All the results obtained during environmental monitoring must be documented for audit purposes;
4. Records of leak tests must be kept;
5. The condition of the tanks, associated piping and the monitoring wells must be inspected on a regular basis;
6. Integrity testing of the tank must take place 5 years after installation, with repetition on a 5-year cycle thereafter. The results of these tests must be incorporated into an annual monitoring report for each of those years;
7. At the end of the life span of the tanks, as governed by the supplier specification, tanks are to be replaced; and
8. Fuel tanks, pipelines and separation filter monitoring are to be undertaken as determined by the authorities.

5.4.2. Tanks, Accessories, Pipework & Installation Specification

Tanks

- The underground storage tanks (USTs) must be double walled ("Jacketed") i.e. possessing secondary containment to prevent tank content release into surrounding soil and ground water. The UST must have an interstitial leak detection monitoring system between the two walls to monitor for product leakage;
- The USTs must be reliable in the event of heavy rains and flooding. UST manholes shall be impermeable and resistant to fuel and they shall consist of a heavy duty cast iron cover, which shall prevent damage from surface traffic;
- Construction of a reinforced concrete slab over the USTs, its thickness and strength is to be determined by a qualified Engineer and as approved by the relevant authorities.

Accessories

- The filler point and tank must be fitted with overfill protection. The critical level should be such that a space remains in the tank to accommodate the delivery hose volume (2%); Earthing and snap tight quick coupling is to be provided for loading of materials into tanks to minimise the risk of fires and prevent spillage and loss of materials;
- The USTs are to be fitted with a tank containment sump, fitted on top of the tank and a dispenser containment sump must be provided, fitted underneath the dispenser as containment;
- Filler spill containment must also be provided for remote filler containment purposes.

Pipework

- All pipeline connections are to be housed within impermeable containment chambers;
- A leak detector on all submersible pumps that automatically checks the integrity of the pipework on the pressure side of the pump must be provided;
- Pipelines must not retain product after use and no joints are to be made underground;
- An emergency shut-off valve must be supplied between the supply pipeline and dispenser inlet;
- All pipes (vent, filler and delivery) are to slope back to the USTs so that fuel does not remain in the pipes;
- Confirmation of filler point and vent position to be made by an approved Engineer for safety distances required;

- Vent pipes above ground are to be galvanised mild steel and are to be at least 1000mm above the roof height and away from any doors, windows, chimney openings and other sources of ignition;
- The tank product lines must be pressure tested prior to commissioning;

Installation

- The excavation must be protected against the ingress of surface run off water, and is to be kept reasonably free of sub-surface water by pumping out if necessary;
- The tank farm must be lined with a High-density polyethylene (HDPE) liner or a suitable clay layer to prevent infiltration of product to the ground water should a spill or leak occur (an impermeable liner is specifically important if bedrock is encountered during excavation activities);
- The UST is to be inspected before installation for damage, including fractures or damage to coating work. Leak and pressure tests must be conducted on tanks and pipelines to ensure integrity prior to operation and the inspection authority must issue pressure test certificates;
- Any repair work required is to be conducted according to SABS 1535 (Glass-reinforced polyester-coated steel tanks, including jacketed tanks, for the underground storage of hydrocarbons and oxygenated solvents and intended for burial horizontally);
- The UST must be buried 750mm below finished ground level in accordance with SANS 10089-3;
- Backfill to the underground structures must comprise well compacted, possibly cement stabilised, inert granular material;
- The void around the UST must be back filled with a non-cohesive granular material to ensure that any product loss through the UST or ancillary pipe work will flow towards the low point;
- The installation must comply with SANS 10 400TT (Fire Protection) 53 Sections 1-6 (The application of the National Building Regulations-Installation of Liquid Fuel Dispensing Pumps and Tanks);
- The local Fire Department must be informed two (2) working days before installation commences and to be called for inspection at the following stages:
 - Installation of tank on clean sand bed before backfilling;
 - Witness pressure test (delivery lines 1000kPa, tank 35kPa);
 - Inspection of slab over tank before concreting;
- The installation of tanks must comply with SANS 10131: 2004 Section 5, (the storage and handling of liquid fuel – large consumer installations), SANS 10089 (Part I, II & III), SANS 1010;
- The installation must comply with local authority bylaws and all procedures and equipment used must be in accordance with the Occupational Health & Safety Act (No. 85 of 1993) and Regulations of South Africa 3:2004, SANS 10083: 2004 and any other required SANS/SABS codes;
- The installation of tanks to comply with all other relevant National Building Regulations and Standards Act No.103 of 1977;
- Upon completion of the UST installation, an engineer is to inspect and verify that the tanks and the associated infrastructure have been installed as per the design criteria and to all required SABS/SANS standards and applicable legislation.

Leak detection/monitoring

- USTs are to be fitted with a monitoring tube to allow for the monitoring of leaks through the tank surface;
- Leak detectors are to be installed to the submersible pumps within UST manholes to ensure that there are no line leaks.

Forecourt Dispensing Area

- The pumps are to be fitted with a Spill Containment Chamber;

- Construction of a concrete bunded reinforced graded slab over the forecourt area, with positive falls towards a centrally located catch-pit/sump. The slabs thickness and strength is to be determined by a qualified Engineer and as approved by the relevant authority;
- The centrally located catch-pit/sump shall drain into a pollution containment chamber i.e. an approved oil/water separator system. Once the wash water has passed through the system, the separated oil must be collected regularly (every three months) by an approved waste contractor and removed to an approved hazardous waste disposal facility;
- The remaining effluent water is to discharge to the existing sewer system;

Refuelling station

- Provision of overspill protection devices in the tank filling pipework to prevent tank overflow during filling operations;
- Construction of a concrete bunded/ dished reinforced graded slab over the filler points at the refuelling station. The slabs thickness and strength is to be determined by a qualified Engineer and as approved by the relevant authority;
- The refuelling station will have positive falls towards centrally located catch-pits;
- There must be regular maintenance and inspections in accordance with the Operational Environmental Management Program (EMPr).
- In the event of an incident all fuel will be contained for later hazard and operability study (HAZOP) analysis;
- During normal operations the oil residue must be regularly (every three months) collected from the containment tank and the oil/waste separator by an approved waste contractor and removed to an approved hazardous waste disposal facility;
- The refuelling station shall be uncovered.

Vapour Recovery Systems

- Stage 1 Volatile Organic Compound (VOC) Vapour Recovery Systems should be installed onto fuel dispensing nozzles at the refuelling and forecourt areas. The filling station operator must ensure that every effort is made to limit gaseous emissions on their site and that all equipment used is manufactured to limit VOC vapour emissions.

General

- The final plans must demonstrate compliance with all required SANS/SABS codes and must be approved by the Ekurhuleni Metropolitan Municipality;
- A section drawing of the UST installation, including associated structures must be included on the final plans submitted and must be approved by the municipality;
- The installation must comply with the National Water Act (No. 36 of 1998);
- The installation is to comply with local by-laws;
- The installation is to comply with the National Building Regulations and Standards Act No. 103 of 1977;
- All procedures and equipment used must be in accordance with the Occupational Health & Safety Act (No. 85 of 1993) and Regulations of South Africa; and.

5.4.3. EMPr monitoring

The key to a successful EMPr is appropriate monitoring and review to ensure effective functioning of the EMPr and to identify and implement corrective measures in a timely manner. The overall monitoring and auditing of the site will be the responsibility of the ECO, however the operator must provide the necessary environmental control and audit measures and integrate these through their Environmental Management Systems. The ECO shall keep records of all activities on site, problems identified, transgressions noted and a task schedule of tasks undertaken by the ECO. The ECO shall remain employed indefinitely until closure of the site (should this occur). The ECO shall remain employed until the close out audit and one year post construction. Records relating to monitoring and auditing must be kept on site and made available for inspection to any relevant and competent authority. Non-compliance with the EMPr must be rectified within one week of the relevant offending party receiving an audit report and notice.

6. ENVIRONMENTAL MANAGEMENT PROTOCOL

As part of the implementation and monitoring requirements, the petrol station operator should be trained in implementing and monitoring compliance with the EMPr and EA and to undertake the necessary monitoring and implementation of the prescribed mitigation measures detailed here (Table 6.1).

The following recommendations are made:

- The facilities should be inspected at least once a week against the prescribed mitigation measures and the weekly report documented.
- A brief report on compliance with the conditions of the EMPr and EA should be prepared and submitted to management for annual review. Remediation action should be clearly identified and implemented timeously.
- All reports should be well documented and in format that are readable and readily retrievable.

Table 6.1: Mitigation measures recommended for the ACSA Jones Road Filling Station, for both construction and operation phases.

IMPACT AREA	DETAILS OF RESPONSIBILITIES	IMPLEMENTATION DATE	MONITORING FREQUENCY	RESPONSIBLE PARTY
Biodiversity Management	Care should be taken during construction to not spread seed into and from site through earth works.	At commencement of rehabilitation	Annually	Contractor and/or Operator appointed by ACSA
	An Alien Invasive Control Programme must be implemented.	Prior to Construction	Annually	
Soil Compaction & Erosion and Stormwater Runoff	Newly cleared and exposed areas must be promptly rehabilitated to avoid soil erosion.	At commencement of rehabilitation	Annually	Contractor and/or Operator appointed by ACSA
	Where necessary, temporary stabilization measures must be used.	Immediately	Monthly	
	Plan for the worst case, that is, for heavy rainfall and runoff events, or high winds	Prior to Construction	Monthly	
	Appropriate erosion control measures must be implemented and a monitoring programme established to ensure that no erosion is taking place. At the first sign of erosion the necessary remedial action must be taken	At Commencement of Construction	Monthly	
	Care must be taken to ensure that runoff is well dispersed so as to limit erosion	At Commencement of Construction	Monthly	
	A site-specific stormwater management plan must be implemented to manage the increased stormwater runoff	Prior to Construction	Once off	
	Storm-water structures need to be implemented as part of the development and must link up with the current storm-water infrastructure in order to navigate stormwater and minimise soil erosion	At Commencement of Construction	Once-off	
	At the first signs of erosion, the correct procedures must be undertaken to manage, resolve and prevent it from occurring	At Commencement of Construction	Monthly	
Fuel & Groundwater Contaminant	Establish a dedicated area for material stockpiling away from the existing stormwater drainage system	At Commencement of Construction	Monthly	Contractor and/or Operator appointed by ACSA
	Establish a site office with a dedicated area for construction vehicles to refuel and		Monthly	

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IMPACT AREA	DETAILS OF RESPONSIBILITIES	IMPLEMENTATION DATE	MONITORING FREQUENCY	RESPONSIBLE PARTY
	where cement can be mixed			
	Vehicle re-fuelling and cement mixing must only take place on impervious surfaces		Monthly	
	Ensure that all construction machinery is in good working order to prevent oil leaks		Daily & Monthly	
	Construction hoses should be checked for leaks on a daily basis		Daily & Monthly	
	Temporary chemical toilets must be provided (separate toilets for males and females) for the duration of the construction period if no waterborne sewerage system is available. These toilets must be made available for all site staff during the construction phase		Monthly	
	The developers must appoint and enter into a contract with a qualified third party service provider for the maintenance of the sanitation system		Weekly	
	If toilets are not mobile they should have a concrete base and be tied down to avoid spillages etc.			
	Sanitary bins should be made available for female staff		Weekly	
	Adequate waste disposal (litter) bins must be available on site. These must be properly secured and covered to prevent scavengers from tipping them		Weekly	
	Any hazardous materials that need to be stored on site must be done so under lock and key. Surfaces must be bunded so that any excess water or spilled fuel can be trapped and stored in a container for disposal.		Weekly	
	A site specific spill contingency plan for the operation and transportation of fuel must be compiled and implemented	Prior to Operation	Once off	
	Monitoring of volumes of the underground storage tanks must take place on a daily basis to detect unexplained losses due to leakages	At Commencement of Operation	Daily	
	The condition of the tanks, associated piping and the monitoring wells must be inspected on a regular basis		Weekly	
	Integrity testing of the tank must take place 5 years after installation, with repetition on a 5-year cycle thereafter	5 Years After the Commencement of Operation	Every 5 Years	
	At the end of the life span of the tanks, as governed by the supplier specification, tanks are to be replaced	As Per Supplier Specification		
	All waste oils, greases, fuels, chemicals etc. should be collected and disposed of in an appropriate manner off site. The contents of grease traps or other waste oil, grease and/ or fuel disposal/ storage containers should under no circumstances be emptied and dumped to the surrounding area	At Commencement of Construction	Daily & Monthly	
	No fuels/ oils must be allowed to discharge directly into stormwater pipes or drains and sewage manholes/pipes		Daily & Monthly	

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IMPACT AREA	DETAILS OF RESPONSIBILITIES	IMPLEMENTATION DATE	MONITORING FREQUENCY	RESPONSIBLE PARTY
	The clean water (e.g. surface runoff) and dirty water (e.g. contaminated water from the forecourt and filling points) must be separated to prevent contaminated run-off from entering the stormwater, groundwater and soil		Daily & Monthly	
	The forecourt area and the filling points should be concreted and graded so that any effluent run-off will not flow to the street, or into stormwater/ sewer systems but pass through the oil water separator sump/s before discharge into the municipal storm water drains;		Once-off	
	The oil/ water separator sump/s must be checked regularly and kept clean to prevent blockage and overflow. In addition, regular monitoring and clearing of the oil/ water separator sump/s will prevent hydrocarbon liquids from discharging into the sewer/ stormwater systems. Waste from the separator must be disposed of at a suitable waste handling site where Safe Disposal Certificates will be issued	At Commencement of Operation	Monthly	
Waste Management (General, Hazardous and Sewerage)	Rubble and other construction waste produced should be re-used if possible and, where it is not possible, must be disposed of at the nearest registered waste disposal facility	At Commencement of Construction	Ongoing	Contractor and/or Operator appointed by ACSA
	Rubble, which will not be reused, must be removed from site on a regular basis		Monthly	
	If rubble is stored on site, it should be stored on designated portions of land away from the road		Monthly	
	Litter must be controlled during construction – adequate bins must be made available on site at all times. These must be made scavenger and weather proof and must be emptied on a regular basis		Weekly	
	Construction materials stored at the site camp must be secured – i.e. plastics must be covered to prevent being blown off site		Daily	
	The construction area must remain litter free and regular inspections for litter must be conducted. The activity should not contribute to any surrounding windblown litter		Daily	
	Skips must be covered and emptied regularly		Weekly	
	Waste manifests must be provided by the municipality to prove legal disposal		Daily	
	Cement bags must be kept in a sealed container		Monthly	
	Waste must not to be buried or burned		Weekly	
	Adequate waste disposal (litter) bins must be available on site. These must be properly secured and covered to prevent scavengers from tipping them		Weekly	
	A responsible person must be appointed to manage the solid waste generated at the		Weekly	

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IMPACT AREA	DETAILS OF RESPONSIBILITIES	IMPLEMENTATION DATE	MONITORING FREQUENCY	RESPONSIBLE PARTY
	filling station in order to ensure that it is properly stored and removed regularly by municipal refuse services			
	Waste water and effluent management must be implemented on site			
	Ablution facilities and associated piping must be adequately lined and checked for leaks on a regular basis			
	All sewage generated from the site must be discharged into the Municipal sewerage reticulation system			
	Paved surfacing coming in contact with vehicles must be bunded such that stormwater flows into an oil/water separator, to allow for treatment of hydrocarbons and other hazardous wastes.			
	Hazardous substances should be disposed of at an appropriate classified waste site (unless it is to be recycled by approved methods), as per the National Environmental Management Waste Act 59 of 2008			
	Sludge from the oil separators must be disposed of to a suitable waste-handling contractor where Safe Disposal Certificates are to be issued			
	All product spills within the bunded area must be appropriately cleaned up			
	All contaminated spill fighting material such as fibres, soil, sandbags, etc. must be disposed of in an appropriate hazardous waste landfill site. Proof of this must be made available upon request			
	Ensure safe disposal of Methanol/water mixture used for removal of any residual water from the fuel tanks			
	Any spilt material must be disposed of at a suitable licensed waste disposal facility, with chain of custody documentation supplied as proof of end recipient			
	The transportation, handling and storage of hazardous and flammable substances must comply with all the provisions of the Hazardous Substances Act 1973, (Act No. 15 of 1973) associated regulations as well as a SANS 10228 and SANS 10089 codes			
	A site-specific stormwater management plan must be implemented to manage the increased stormwater runoff			
Cultural Heritage, Archaeology and Palaeontology	Should any archaeological or cultural sites or objects be located during the construction of the proposed project, it should immediately be reported to the South African Heritage Resources Agency (SAHRA). Failure to report a site or object of archaeological and/or cultural significance is a contravention of the National Heritage Act (Act No. 25 of 1999)	At Commencement of Construction	Monthly	Contractor and/or Operator appointed by ACSA
	All construction site staff should be briefed		Monthly	

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IMPACT AREA	DETAILS OF RESPONSIBILITIES	IMPLEMENTATION DATE	MONITORING FREQUENCY	RESPONSIBLE PARTY
	to immediately report any sites or objects, which are located during the construction of the facility. In the event of finding what appears to be an archaeological site or a cultural and/or historic site or object, work should be terminated until a qualified archaeologist or historian can examine the item			
Air and Noise Pollution	Topsoil should be cleared in a phased manner to avoid large areas of bare ground	At Commencement of Construction	Monthly	Contractor and/or Operator appointed by ACSA
	Employ dust suppression measures such as wetting of the project area during dry, windy periods (Only water from a licensed source will be used)		Monthly	
	Where practical, do not leave large cleared areas exposed for longer than necessary		Monthly	
	The area of disturbance must be kept to a minimum at all times		Monthly	
	No unnecessary clearing of vegetation, digging or scraping should occur		Monthly	
	Vehicle speed should be limited to the lowest possible, and should not exceed 40km/h on the construction site		Ongoing	
	Construction vehicles must be regularly maintained in order to ensure that no unnecessary exhaust fumes are being emitted		Monthly	
	Stage 1 Volatile Organic Compound (VOC) Vapour Recovery Systems, should be installed onto fuel dispensing nozzles at the refuelling and forecourt areas			
	Operators must ensure that every effort is made to limit gaseous emissions	At Commencement of Operation	Ongoing	
	All equipment used must be manufactured to limit VOC vapour emissions	Prior to Implementation		
	Operational refuelling procedures must be put in place to limit vapour emissions during refuelling of vehicles and storage tanks	At Commencement of Operation	Monthly	
	No construction activities may take place between sunset and sunrise	At Commencement of Construction	Ongoing	
	Machinery that generates noise must be regularly maintained in order to ensure that no unnecessary additional noise is produced		Weekly	
	Equipment with lower sound levels should be selected where feasible		Ongoing	
	No construction activities after 13:00 on Saturdays, Sundays and public holidays		Ongoing	
Workers must not produce any unnecessary noise e.g. no loud music to be played, no whistles to be used etc.	Ongoing			
The Ekurhuleni Metropolitan Municipality by-laws relating to noise must be adhered to at all times	Ongoing			
Visual Impacts	Employ techniques to suppress dust and smoke generation during construction	At Commencement of Construction	Monthly	
	The contractor should maintain good housekeeping on site to avoid litter and		Daily	

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IMPACT AREA	DETAILS OF RESPONSIBILITIES	IMPLEMENTATION DATE	MONITORING FREQUENCY	RESPONSIBLE PARTY
	minimise waste			ACSA
	Night lighting of the construction sites should be minimised within requirements of safety and efficiency		Ongoing	
	Fires and fire hazards need to be managed appropriately		Ongoing	
	Building finishes should be of appropriate design and quality			
	Buildings should be designed in such a way that it fits into the surrounding industrial environment	Prior to Construction	Once off during design phase	
	Waste must be removed from site regularly and disposed of at a registered landfill site in order to avoid unnecessary litter being viewed on site	At Commencement of Operation	Weekly	
	General good housekeeping must be maintained at all times.		Weekly	
Traffic & Transportation	Large construction vehicles must not be permitted to utilize public roads during peak hours (AM: 06:30 – 08:30 and PM: 16:00 – 18:30)	At Commencement of Operation	Ongoing	Contractor and/or Operator appointed by ACSA
	Damages to public roads caused by large construction vehicles must be repaired immediately		Weekly	
	The proposed external road upgrades and site access routes must be constructed in line with the relevant design standards	Prior to Construction	Ongoing	
	Fuel tankers required on site must avoid peak hour traffic (AM: 06:30 – 08:30 and PM: 16:00 – 18:30)	At Commencement of Operation	Ongoing	
	Any damage to roads caused by fuel tankers must be reported to the municipality and repaired immediately		Monthly	
	All mitigation aspects referred to in the Traffic Access Study (WSP, 2013) must be adhered to fully		Ongoing	
Health and Safety	All relevant Health and Safety legislation as required in South Africa should be strictly adhered to, including but not limited to the Occupational Health and Safety Act, 1993 (No. 85 of 1993)	At Commencement of Construction	Ongoing	Contractor and/or Operator appointed by ACSA
	Smoking should be prohibited in the vicinity of flammable substances		Ongoing	
	Ensure the availability of sufficient firewater tie-in points		Ongoing	
	Any welding or other sources of heating of materials should be done in a controlled environment and under appropriate supervision		Ongoing	
	Ensure availability of fire extinguishers		Annually	
	All employees must be aware of emergency/ contingency plans to ensure an understanding of the hazards and procedures required during an emergency situation		Monthly	
	An emergency preparedness and response plan must be implemented for the duration of construction		Prior to Construction	
	Records of environmental and/or health and	At	Monthly	

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IMPACT AREA	DETAILS OF RESPONSIBILITIES	IMPLEMENTATION DATE	MONITORING FREQUENCY	RESPONSIBLE PARTY
	safety related incidents should be maintained and communicated to the relevant persons	Commencement of Construction		
	During construction the site shall be fenced off to prevent access		Once-off prior to construction	
	Fencing shall be inspected weekly and maintained properly, by the Contactor, until construction is complete		Weekly	
	The Contractor shall ensure that signage, which should be pictorial and in the vernacular, is erected on all boundary fences warning against entering the construction area		Once-off prior to construction	
	Traffic calming and speed control measures for access to construction sites shall be instigated in consultation with the local authorities		Monthly	
	Kitchens must be fully equipped with necessary safety and fire-fighting equipment		At Commencement of Operation	
	All staff to be trained in relevant health and safety aspects	Annually		
	A qualified first-aider must be present on site at all times	Ongoing		

7. STORMWATER MANAGEMENT PLAN

The proposed filling station will be located on an existing grassed area. The introduction of impermeable surfaces will reduce infiltration of rainwater and increase runoff. The main storm water management objectives and criteria that are considered to be relevant to the design and planning of storm water drainage systems include:

- Minimising the threat of flooding;
- Minimising public inconvenience caused by frequent storms;
- Protecting the public and preventing the loss of life due to severe storms and/or malfunctioning drainage systems;
- Preventing erosion and siltation;
- Protection of receiving water bodies;
- Minimising costs;
- Sustainability of storm water management systems;
- Environmental and water pollution considerations.

7.1. Storm Water Drainage System

The existing external storm water pipe network, which will be utilised by the filling station, is designed to have sufficient inlet capacity and pipe capacity. The site drains to North-East via a water line located along Jones Street along the northern site boundary. All storm water runoff from the roof gutters, uncovered driveways and hard paved areas on the site will be considered “clean” water and must be diverted into the existing bulk storm water line. The handling of storm water runoff from the refuelling station and forecourt area is covered in more detail below. The proposed filling station is to tie into the existing system via the proposed 330m³ stormwater attenuation dam which will be located between the filling station and the existing stormwater outlet (Figure 3.2).

7.2. Forecourt Dispensing Area

The forecourt is to be covered and any wash water from this area will be directed via a concrete graded slab, with positive falls towards a centrally located catch-pit/sump. The slabs thickness and strength is to be determined by a qualified Engineer and as approved by the relevant authorities. The centrally located catch-pit/sump shall drain into a pollution containment chamber i.e. an approved oil/water separator system. Once the wash water has passed through the system, the separated oil must be collected regularly (every three months) by an approved waste contractor and removed to an approved hazardous waste disposal facility. It is anticipated that the approving Authorities would likely require similar design principles in their consideration of the project.

The site must be managed in a manner that prevents pollution of downstream watercourses or groundwater, due to suspended solids, silt or chemical pollutants. This should include:

- Temporary cut-off drains and berms may be required to capture stormwater and promote infiltration.
- Hazardous substances must be stored at least 100m away from any water bodies to avoid pollution.

8. ENVIRONMENTAL AWARENESS

Contractors shall ensure that its employees and any third party who carries out all or part of the Contractor's obligations are adequately trained with regard to the implementation of the EMP, as well as regarding environmental legal requirements and obligations. Training shall be conducted by an independent person where necessary. Environment and health awareness training programmes should be targeted at two distinct levels of employment, i.e. management and labour. Environmental awareness training programmes shall contain the following information:

- The names, positions and responsibilities of personnel to be trained;
- The framework for appropriate training plans;
- The summarised content of each training course;
- A schedule for the presentation of the training courses.

The person conducting training shall ensure that records of all training interventions are kept in accordance with the record keeping and documentation control requirements as set out in this EMP. The training records shall verify each of the targeted personnel's training experience.

The Developer shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness and the content of the EMP. The presentation needs to be conducted in the language of the employees to ensure it is understood. The environmental training shall, as a minimum, include the following:

- The importance of conformance with all environmental policies.
- The environmental impacts, actual or potential, of their work activities.
- The environmental benefits of improved personal performance.
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Eskom's environmental management systems, including emergency preparedness and response requirements.
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities.
- Environmental legal requirements and obligations.
- Details regarding floral/faunal species of special concern and protected species, and the procedures to be followed should these be encountered during the construction of the bridge, main access roads, approach roads or construction camps.
- The importance of not littering.
- The importance of using supplied toilet facilities.
- The need to use water sparingly.
- Details of and encouragement to minimise the production of waste and re-use, recover and recycle waste where possible.
- Details regarding archaeological and/or historical sites which may be unearthed during construction and the procedures to be followed should these be encountered.

The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed. If necessary, a translator should be called to the site to further explain aspects of environmental or social behaviour that are unclear. An environmental training and awareness course has been provided in Annexure 2.

9. CONCLUSION

Although all foreseeable actions and potential mitigations or management actions are contained in this document, the EMPr should be seen as a day-to-day management document. The EMPr thus sets out the environmental standards that are required to minimise the negative impacts and maximise the positive benefits of the proposed development as detailed in the BAR. The EMPr is a “live document”, and if continuously reviewed and managed correctly can result in successful construction and operation of the proposed development.

All attempts should be made to have this EMPr available, as part of any tender documentation, so that the contractors are made aware of the potential cost and timing implications needed to fulfil the implementation of the EMPr, thus adequately costing for these. Further guidance should also be taken on any conditions contained in the Environmental Authorisation, if the project is granted approval, and that these conditions must be incorporated into the final EMPr.

ANNEXURE 1: METHOD STATEMENTS

Method statements need to be compiled by the Contractor for approval by the ECO. For the purposes of the environmental specification, a method statement is defined as a written submission by the Contractor to the ECO setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, in such detail that the ECO is enabled to assess whether the Contractor's proposal is in accordance with the EMPr and / or will produce results in accordance with EMPr.

The method statement shall cover applicable details with regard to:

- Construction procedures,
- Materials and equipment to be used,
- Getting the equipment to and from site,
- How the equipment/ material will be moved while on site,
- How and where material will be stored,
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur,
- Timing and location of activities,
- Compliance/ non-compliance with the Specifications, and
- Any other information deemed necessary by the Engineer.

The Contractor shall abide by these approved method statements, and any activity covered by a method statement shall not commence until the ECO has approved the method statement. The method statement shall be submitted to the ECO not less than 20 days prior to the intended date of commencement of the activity, or as directed by the ECO.

METHOD STATEMENT

CONTRACT:..... **DATE:**.....

PROPOSED ACTIVITY (give title of method statement and reference number from the EMPr):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

Start Date:	End Date:

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated sketches and plans where possible):

* Note: please attach extra pages if more space is required

DECLARATIONS

1) ENVIRONMENTAL CONTROL OFFICER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(Signed)

(Print name)

Dated: _____

2) PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)






Dated: _____

ANNEXURE 2: BASIC ENVIRONMENTAL EDUCATION COURSE







<http://www.webweaver.nu/clipart/environmental.shtml>

Reasons why should we look after the environment

-  We have a right to a clean environment
-  A clean environment is essential to healthy living
-  All our basic needs come from the environment
-  A contract has been signed – development vs the environment
-  Penalties / fines could be issued

How to look after the environment

-  Report issues
-  Teamwork
-  Follow the set rules and guidelines (EA, EMPr, Method statements etc.)
-  Conserve, reuse and recycle

Tips and Guidelines

- Workers and equipment should not be allowed outside demarcated areas
- No swimming or polluting of water bodies allowed
- No damage / disturbance to vegetation or water bodies without consent / permits
- No disturbance allowed in no-go areas
- No hunting of animals
- Report all fires
- No burning or burying of waste
- No smoking near hazardous materials
- Training on fire fighting equipment
- Hazardous materials to be stored in designated and banded areas
- Spill kits and drip trays a must
- Report all spills
- Control dust and Noise
- Maintain construction vehicles
- Availability and maintenance of sanitation facilities



Tips and Guidelines

- ☒ Only eat in designated areas
- ☒ Do not litter
- ☒ Vehicles to remain on approved tracks and adhere to speed limit
- ☒ Ensure emergency phone numbers are available
- ☒ Ensure PPE is worn
- ☒ Report fires, leaks and injuries
- ☒ Ask if unsure



ANNEXURE 3: EXPERTISE OF EAP**DR. ERIC E IGBINIGIE (Pr. Sci. Nat.)**

Date of birth: 21 March

QUALIFICATIONS

2008: PhD. Biotechnology. Rhodes University, South Africa
 2004: MSc. Environmental Biotechnology. Rhodes University, South Africa
 2003: Environmental Management Training. Received training in Industrial Environmental Management
 1999: BSc. Hons. Biochemistry. Ambrose Alli University, Nigeria (formally Edo State University)

Training

2013: Contaminated Land Workshop (IMBEWU Sustainability Legal Specialist (Pty) Ltd / GEO Pollution Technologies).
 2011: Climate Change: Adaptation and Mitigation – Swedish Metrological and Hydrological Institute, Sweden (Part I Sweden and Part II Namibia).
 2010: Environmental Impact Assessment Certificate – Coastal & Environmental Services / Rhodes University, South Africa
 2003: Industrial Environmental Management & Process Biotechnology – MSc Module, Rhodes University, South Africa

MEMBERSHIP

- South African Council for Natural Scientific Professions (Environmental Science: 400201/09).
- Water Institute of Southern Africa (WISA) (20783).
- Institution for Chemical Engineers (ICChemE, UK) (99904277).
- International Water Association (IWA, UK) (00895495.)

PROFESSIONAL EXPERIENCE

May 2010 – Present: Senior Environmental Consultant (Coastal & Environmental Services, South Africa). I serve as a specialist consultant and project manager in projects that are rooted in my areas of specialisation including Basic Assessment, Environmental Impact Assessment, Environmental Due Diligence (Phase 1, 2 & 3), Environmental & Social Due Diligence, Management Systems and Auditing, Bioremediation and Waste valorisation processes. My project management duties include active project opportunity search, developing expression of interest and proposals as well as the management and maintenance of prospective and existing clients.

July 2009 – April 2010: Senior Research Scientist / Post graduate co-ordinator (Institute for Environmental Biotechnology, Rhodes University (EBRU)). Led a research group tasked with the bioremediation of coal spoils. Lectured Sustainable Environmental Biotechnology at M.Sc and Honours levels.

January 2008 – April 2009: Post-Doctoral Fellowship / Course leader: Environmental Biotechnology at EBRU.

June 2000 – November 2002: Water quality control analyst (Edo Pharmaceuticals Benin city, Nigeria). Duties included water supply and quality analyst, general wet chemistry analyst, National water quality report compilation and presentation and computer lab manager.

March 1999 – February 2000: Field officer, National Programme on Immunization (NPI) (National Youth Service Corps (NYSC) Kano State, Nigeria). Duties included rural health educator, data

Last Updated: 25-06-2013

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collection for the NPI and Implementation of Polio vaccination in rural areas.

CONSULTING EXPERIENCE

Environmental Due Diligence (Contamination Assessment)

South Africa:

- Jan. 2013: Environmental Due Diligence Assessment (Phase 1 and 2) for the Coega Brick at the Industrial Development Zone, Port Elizabeth, South Africa.
- Feb. 2012: Contaminated Land Assessment – Fishwater Flats Wastewater Treatment Works. Port Elizabeth, South Africa.
- Jun. 2011: Environmental Due Diligence Assessment (Phase 1 and 2) for the Coega Zone 6 Industrial Development Zone, Port Elizabeth, South Africa.
- Nov. 2011: Environmental Due Diligence Assessment (Phase 1 and 2) for the Coega Zone 13 Industrial Development Zone, Port Elizabeth, South Africa.

Environmental Monitoring, Training and Implementation

South Africa:

- 2012 to date: EIA Short Course Rhodes University: (i) Post EIA implementation and monitoring, (ii) Development of Environmental and Social Monitoring Plan.

Mozambique:

- 2011: Kenmare Moma mine Environmental Monitoring Programme update.
- 2011: Water and effluent monitoring requirements based on the IFC, MIGA and the Mozambican legislation for the purpose of the environmental completion for Kenmare Moma Mines Mozambique. Designed, developed and implemented a water and effluent monitoring programme. Contributed to the design and development of 3 portable water treatment plants and three domestic waste water treatment plants for the mine.
- 2011: Developing a wet chemistry manual for Kenmare Moma mine and trained personnel on effluent and water monitoring including sampling, analysis and result interpretation. Training also included the management of the onsite portable water treatment plant and sewage plant.

Madagascar:

- Feb. 2013: Toliara Sands' Renobe Mine Project Environmental and Social Monitoring Plan.

Sierra Leone:

- 2012: Developed a wet chemistry manual for Addax Bioenergy Sierra Leone and trained personnel on effluent and water monitoring including sampling, analysis and result interpretation.

Environmental and Social Management Plan

Liberia:

- Mar. 2013: Equatorial Palm Oil Environmental and Social Management System in accordance with the IFC Performance Standard 1.

Madagascar:

- Feb. 2013: Toliara Sands' Renobe Mine Project: Environmental and Social Management System in accordance with the IFC Performance Standard 1.

Mozambique:

- May, 2013: Niassa Green Resource Forestry Environmental and Social Management Plan.
- Sep. 2011: GS Cimentos Cement Plant Environmental and Social Management Plan
- Sep. 2011: GS Cimentos Limestone Quarry Environmental and Social Management Plan.
- 2010: Developed the EMS ISO 14001 for Kenmare Moma Mines, Mozambique.

Zambia:

- May, 2013: Trident Copper and Nickel Project, Enterprise deposit, North Western Province, Zambia: Environmental and Social Management Plan.

Waste Management Specialist Studies

Ghana:

- Jun. 2012: African Plantation for Sustainable Development Biomass Power Plant Project: Waste and Wastewater Assessment Specialist Report in accordance with National Legislation and the IFC Industry Specific EHS Guidelines for Forest Harvesting Operations and Thermal Power Plant.

Liberia:

- Mar. 2012: Equatorial Palm Oil Waste and Wastewater Specialist Assessment Report in accordance with National Legislation and the IFC Industry Specific EHS Guidelines for Plantation Crop Production and Vegetable Oil Processing.

Madagascar:

- Jun. 2012: Toliara Sands' Renobe Mine Project Waste and Wastewater Specialist Assessment Report in accordance with National Legislation and the IFC Industry Specific EHS Guidelines for Mining.

Malawi:

- Nov. 2010: Kangankunde Monazite Mine, Malawi: Waste and Wastewater Specialist Assessment Report in accordance with National Legislation and the IFC Industry Specific EHS Guidelines for Mining.

Mozambique:

- May, 2010: Kenmare Moma Titanium Mining Project: Sanitation Assessment Report.

Sierra Leone:

- Nov. 2012: Samshi Steel Mill and Power Plant Project Sierra Leone: Waste and Wastewater Specialist Assessment Report in accordance with National Legislation and the IFC Industry Specific EHS Guidelines for Integrated Steel Mill and Thermal Power Plant.

Zambia:

- Feb. 2011: Trident Copper and Nickel Project, Sentinel Deposit North Western Province, Zambia: Assessment of Infrastructure, Waste and Process Related Issues.

Environmental and Social Due Diligence (Compliance Audits)

Kenya / Uganda:

- Current: Independent Environmental Monitor for the Rift Valley Railway Kenya and Uganda.

Mozambique:

- 2012: IFC PS deviation assessment and implementation for heavy mineral mining project, Kenmare Moma Mines, Mozambique.
- Sep. 2010: Rehabilitation Plan for Kenmare Moma Titanium Minerals Project, Mozambique.

Nigeria:

- Current: Olokola Single Point Mooring and Tank Farm ESIA gap analysis based on the International Finance Corporation (IFC) Performance Standards (PS) and Industry Specific guidelines and requirement.
- Jan. 2013: Environmental and Social Due Diligence for the proposed Ossiomo Petrochemical Ammonia-Urea project, Ologbo, Edo State, Nigeria – SWEDFUND.

Climate Change – Adaptation and Mitigation

Nigeria:

- May, 2011: Integrated Municipal Solid Waste management: A Potential Waste-to-Energy Project in Nigeria.

Zambia:

- Feb. 2011: Effects of the Trident Project on Global Climate Change: Trident Copper and Nickel Project, Sentinel Deposit North Western Province.

Environmental Impact Assessment and Pre-Feasibility Assessment

South Africa:

- 2012: Basic Assessment for the Healdtown College Sewage Treatment Package Plant, Forth Beaufort, South Africa.
- 2012: Environmental Impact Assessment Report and Environmental Management Plans for the upgrade of the Fishwater Flats Wastewater Treatment Works, Coega Development Zone, Port Elizabeth.
- 2011: Scoping Report – Upgrade of the Fishwater Flats Wastewater Treatment Works, Coega Development Zone, Port Elizabeth.
- 2011: Pinedale Eco-Estate Environmental Impact Assessment. Bathurst, Eastern Cape Province South Africa.
- 2010: Basic Assessment Report – Wood Energy Biomass Project, Grahamstown, South Africa.

RESEARCH & TEACHING EXPERIENCE

2012 - Environmental Impact Assessment Short Course at Rhodes University

- Facilitator for the EIA short course.
- Lectured - Post EIA implementation and monitoring.

2009 – Current: Post-graduate Supervision

- PhD Supervision: Development of a broad spectrum biocatalyst tool for coal & petroleum contaminated soil. (Current).
- MSc Supervision: Stacked-Heap coal bioreactor process in coal dumps rehabilitation. (Current).
- 2011: Coal-derived humic acid as a sustainable material for soil amendment. (Honours).
- 2011: The role of *Cynodon dactylon* root exudates in coal spoils rehabilitation. (Honours).
- 2010: Characterization and beneficiation of weathered coal-derived humic acid. (Honours).

July 2009 – April 2010: Senior Research Scientist - EBRU

- Supervise and lead the coal dump bioremediation and beneficiation research group and was responsible for its deliverables.
- Lectured Sustainable Environmental Biotechnology at Post-graduate level.
- Reviewer - The South African Journal of Science.
- Responsible for the safety and health environment of EBRU.
- Responsible for research logistics.

July 2009 – April 2010: Anglo Coal land rehabilitation (FungCoal) project, Phase III (AngloCoal) *Research*: Integrated approach for beneficiating acid mine drainage (AMD) in conjunction with coal spoils and its applications in coal dump rehabilitation strategy that is channelled towards a clean development mechanism (CDM).

Responsibility: Supervised and lead the research team and was responsible for its deliverables

Funder: Anglo Coal South Africa.

May 2008 – January 2009: Flue gas beneficiation (SASOL)

Research: The beneficiation of algal sequestered industrial CO₂ (derived from flue gas) for the production of biofuel (Bio-methane and Bio-diesel) and other fine chemicals.

Responsibility: Research deliverables.

Funder: Sasol.

Outcome: Confidential Feasibility report submitted to Sasol, South Africa (2009).

January 2004 – December 2007: Anglo Coal land rehabilitation (FungCoal) project, Phase II

(AngloCoal)

Research: The microbial biotransformation of coal materials for coal dump rehabilitation purpose and the beneficiation of coal waste spoils

Responsibility: Research deliverables.

Funder: Anglo Coal South Africa.

Outcomes:

- Patented technology (See Patent & Publications).
- Publications (See Patent & Publications).
- PhD thesis (2007). (See Patent & Publications)
- Anglo Coal FungCoal Report, Phase I and II. (See Patent & Publications)
- Grant awarded for FungCoal Phase III: Research grant for 4-year duration.

February 2003 – January 2004: Anglo Platinum wastewater treatment project (Anglo Platinum)

Research: Investigating the enzymatic recovery of platinum from platinum waste streams

Responsibility: Responsible for the research outcome

Funder: Anglo Platinum South Africa.

Outcomes:

- MSc thesis (2004) (See Patent & Publications).
- Beneficiation of platinum wastewater - Confidential report submitted to Anglo Platinum South Africa (2004)

SELECTED PUBLICATIONS AND PATENT

2013: Lerato M. Sekhohola, **Eric E. Igbinigie** and A. Keith Cowan. Biological degradation and solubilization of coal: A review. *Biodegradation*. 24(3):305-318.

2011: South African Patent Office Patent Number 2010/02354 - Rhodes University (Stacked-Heap Coal Bioreactor). Contributors: Rose, P.D., **Igbinigie, E.E.**, Horan, M.P., Dames, J.F & Mukasa-Mugerwa, T.T.

2010. **Igbinigie, E.E.**, Mutambanengwe, C.Z. & Rose, P.D. Phyto-bioconversion of hard coal in *Cynodon dactylon*/coal rhizosphere. *Biotechnology Journal*. 5:292-303.

2008. **Igbinigie, E.E.**, Atkins, S., van Breugel, Y., van Dyke, S., Davies-Coleman, M.T. & Rose, P.D. Fungal biodegradation of hard coal by a newly reported isolate, *Neosartorya fischeri*. *Biotechnology Journal*. 3:1407-1416.

2007. **Igbinigie, E.E.** The rhizosphere as a bioprocess environment for the bioconversion of hard coal. PhD Thesis. Rhodes University.

2007. Rose, P.D., **Igbinigie, E.E.**, Horan, M., Atkins, S., van Dyk, S., van Breugel, Y., Mukasa-Mugerwa, T., Dames, J., Mutambanengwe, C.Z., Bowker, M. & Laubscher, R. Biotechnology of coal biosolubilization and applications in waste coal beneficiation. Anglo Coal FungCoal Report, Phase II. 1-349.

2004. Rose, P.D., Clarke, A. & **Igbinigie, E.E.** Biotechnology of coal biosolubilization and applications in biological treatment of mine drainage wastewaters and waste coal beneficiation. Anglo Coal FungCoal Report, Phase I. 1-100.

2004. **Igbinigie, E.E.** The enzymatic use of hydrogenase in sulphate reducing bacteria for the removal of platinum from industrial wastewater. MSc Thesis. Rhodes University.

ANNEXURE 4: SENSITIVITY MAP

