

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Proposed refurbishment and expansion of a multi-story residential block situated at 50 Lagoon Drive, Umhlanga Rocks, located within the eThekweni Municipality

[EIA reference number: DM//0010/2017]

VERSION 4

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Table of Contents

1. INTRODUCTION	4
1.1. Background Information and Project Description	4
1.2. Points to Consider	7
2. PROJECT RESPONSIBILITIES	7
2.1. Project Engineer	7
2.2. Environmental Control Officer (ECO)	8
2.3. Contractor and Sub-contractors	8
2.4. Developer	9
3. THE ENVIRONMENTAL MANAGEMENT PLAN (EMP)	9
3.1. Objectives of the EMP	9
3.2. Environmental Monitoring	10
3.3. Compliance with the EMP	10
3.4. Layout of the EMP	11
3.5. Training	11
3.6. Implementation of EMP by Contractor	11
3.7. Environmental File	12
3.8. Environmental Emergency Response plan	12
3.9. Method Statements	12
4. RELEVANT LEGISLATION	13
5. DESIGN AND PRE-CONSTRUCTION PHASES	15
5.1. Shadow Impact Assessment:	15
5.2. Authorisations, Permits and Licenses:	15
5.3. Appointment of Contractor:	16
5.4. Appointment of ECO	16
5.5. Environmental Training	16
5.6. Environmental Planning and Design	17
5.7. Environmental Education and Training	17
6. CONSTRUCTION PHASE	19
6.1. Traffic Pressures and Access	19
6.2. Soil Erosion and Stormwater	20
6.3. Ground water Pollution	20
6.4. Surface water Pollution	21
6.5. Risk of alien invasive encroachment into disturbed areas	22
6.6. Flora - Damage and removal of existing indigenous vegetation	22
6.7. Fauna - Hunting/ Fishing/ Poaching by construction workers	23
6.8. Waste and littering around the site	23
Litter	23
Construction Rubble	24
Hazardous waste	24
Sanitation	24
6.9. Noise disturbance	25
6.10. Air Quality	25
6.11. Visual Quality	26
6.12. Public safety and health	26
6.13. Existing Infrastructure Disturbance	27
6.14. Social Impacts	27
7. REHABILITATION PHASE	29

7.1. Rehabilitation	29
7.2. Employees.....	30
7.3. Management and Monitoring	30
8. OPERATIONAL PHASE	31
8.1. Increased pressure on municipal water supply	31
8.2. Increased pressure on electrical supply	31
8.3. Sewage Discharge.....	31
8.4. Noise and Disturbance	31
8.5. Air Quality	32
8.6. Visual Impacts.....	32
8.7. Surface Run-off	32
9. PROPOSED MONITORING AND AUDITING.....	33
9.1. Site Audits.....	33
9.2. Audit Methodology.....	33
9.3. Responsibility	33
CLOSING COMMENTS	33

Acronyms Used

Acronym	Definition
EDTEA	Department of Economic Development, Tourism and Environmental Affairs (Kwa-Zulu Natal)
DW&S	Department of Water and Sanitation
ECO	Environmental Control Officer
EWS	Ethekwini Water and Sanitation
EMP	Environmental Management Plan
I&AP	Interested and Affected Party(ies)
PM	Project Manager

1. INTRODUCTION

1.1. Background Information and Project Description

1World Consultants (Pty) Ltd has been appointed by Arup (Pty) Ltd, on behalf of *Dalmation Duo Investments (Pty) Ltd*, to undertake the required environmental services for the proposed refurbishment and expansion of a multi-story residential block situated at 50 Lagoon Drive, Umhlanga Rocks, located within the eThekweni Municipality. The proposed redevelopment of “*Fleetwood on Sea*” is located within 100m from the High Water Mark (HWM) of the sea within an urban area.

Table 1: Project Specifications

	<i>“Fleetwood on Sea”</i>
Ward	Ward 35
Property Description	Lot 1096 Umhlanga Rocks
Property Extent	4184m ²
New Development Footprint on the Ground Level	500m ²
Number of Additional Levels (new Block)	16 levels
Total Floor Area Ratio (far)	6775sqm
Development Specifications	<ul style="list-style-type: none"> • Expansion to existing apartment • New pedestrian entrance • New vehicle entrance + Gatehouse • New boundary wall

As per GN R982 of the EIA Regulations, 2014, a Basic Assessment (BA) Process has been undertaken and the environmental outcomes, impacts and residual risks of the proposed Listed Activity being applied for have been noted and assessed accordingly by the Environmental Assessment Practitioner (EAP).

The proposed development will involve the refurbishment of the existing structure (i.e. updating the façade and internals) of “*Fleetwood on Sea*”, located on Lagoon Drive. This includes:

- Demolition of portion of the existing structure
- The redevelopment and revamping of the existing apartment building
- Refurbishment of the entertainment area to include new lifts, stairs, bar, covered terrace, pool, and much more.
- Existing units and penthouse apartments will be upgraded

The proposed expansion will be a multi-story residential block. The site is located within 100m from the High Water Mark of the sea (HWM). The site is located within an urban area. The existing site area is 4184sqm. The development will entail the following:

- A new pedestrian entrance
- A new vehicle entrance and gatehouse
- New boundary wall
- Expansion to existing apartment/ Parking block
- Entertainment area will be refurbished to include new lifts, stairs, bar, covered terrace, pool, and much more.
- Existing units and penthouse apartments will be upgraded

“*Fleetwood on Sea*” will be expanded to include 10 additional above ground level.



Figure 1: An aerial view of the existing structure of the “Fleetwood on sea” hotel located on Lagoon Drive.

The proposed redevelopment of “Fleetwood on Sea” (Lagoon Drive) is located within Ward 35 of the eThekweni Municipality. **Map 1** below depicts the general locality of “Fleetwood on Sea”

Table 2: Site Details

Refurbishment and Expansion of “Fleetwood on Sea”	
Property Description	Lot 1096 Umhlanga Rocks
SG Number	NOFU03510000109600000
Property Size	4184m ²
GPS Coordinates	29° 43' 11.78" S; 31° 05' 25.29" E



MAP 1: GENERAL LOCALITY OF FLEETWOOD ON SEA, UMHLANGA ROCKS, LOCATED WITHIN THE ETHEKWINI MUNICIPALITY.

1.2. Points to Consider

- Traffic pressures and access
- Soil erosion and stormwater
- Ground water pollution
- Surface water pollution
- Risk of alien invasive encroachment into disturbed areas
- Flora - damage and removal of existing indigenous vegetation
- Fauna - Hunting/ Fishing/ Poaching by construction workers
- Waste and littering around the site
- Noise disturbance
- Air quality
- Public safety and health
- Existing infrastructure disturbance
- Social impacts
- Increased pressure on municipal water supply
- Increased pressure on electrical supply
- Sewage Discharge
- Noise and Disturbance
- Shadows on Beaches
- Visual impacts

2. PROJECT RESPONSIBILITIES

The project team will consist of the Project Manager, the Project Engineer, the Environmental Control Officer (ECO) and the Contractor.

2.1. Project Engineer

The Project Engineer will provide the project specifications of the construction phase. The contractor is legally bound to follow these specifications unless agreed upon by the Engineer. The engineer has the following responsibilities:

- Monitor compliance of the project, following provision of inspection reports provided by the ECO.
- Assess the Contractors performance with regard to completion of the task and keep records on a monthly basis.
- Facilitate the site handover to the Contractor

Company Name	Arup (Pty) Ltd
Contact Person	Shaun Dixon
Address	167 Florida Road
Telephone	0313288700
Fax	0313288701
Email	Shaun.dixon@arup.com

2.2. Environmental Control Officer (ECO)

The ECO is responsible for monitoring and reporting that the contractor and applicant are implementing and following the EMP during the construction and operational phases (for the timeframe specified in the conditions of the environmental authorisation) and to liaise and report to EDTEA. The following will fall within the ECO responsibilities:

- Have a working knowledge of the recommendations and mitigation measures as provided in this EMP and of the permits, authorisations and licenses.
- Conduct monthly audits of the construction site according to the EMP and according to the conditions of the environmental authorisation.
- Provide the contractor with environmental training and a copy of the EMP and ensure in writing that it is understood.
- Liaise regularly with the contractor and project manager.
- Recommend corrective steps for any non-compliance activity on site with respect to the EMP.
- Compile a monthly audit report highlighting compliance and non-compliance with the EMP and submit to EDTEA.
- All agreements between the contractor and the ECO with regard to the EMP will be in writing and co-signed by the Project Manager.
- The ECO will **not** be on site on a daily basis and the Contractor is responsible for implementing the EMP. The Contractor will be provided with a contact number for the ECO.

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Contact Person	Yusuf Raja
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Fax	0313288701
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2.3. Contractor and Sub-contractors

The Contractor is responsible for implementing and adhering to the EMP during the construction phase, in all respects as stipulated. Compliance with the EMP by staff during the construction must be ensured by the contractor and this must be recorded by the contractor for audit purposes. The following will be the responsibility of the Contractor:

- Be familiar with the EMP and all conditions of authorisations, licenses and/or permits.
- Supply method statement for implementation of the EMP
- Attend training provided by the ECO, and relay training to all staff and sub-contractors. Proof of training must be kept on record.
- Maintain an environmental file that must contain the following documents:
 - Company environmental policy
 - Hazardous material handling and storage protocols
 - Spill Contingency Plan
 - Emergency Response Plan and Contact Numbers
 - Waste disposal certificates
 - Servicing of portable toilets
- Maintain an environmental complaints register that must have carbon copies and numbered pages, to record all incidents that occur on site during construction. Incidents include but may not be limited to:

- Public involvement / complaints
- Occupational health and safety incidents
- Incidents involving hazardous materials and/or equipment on site
- Non-compliance incidents
- Spills into or around watercourses
- Encountering fauna of interest
- Finding archaeological artefacts and/or human remains
- Bear any costs associated with non-compliance and/or damage to the environment as a result of not implementing the EMP or due to negligence.

2.4. Developer

The Developer is legally ultimately responsible for the overall compliance with the conditions of the environmental authorisation, since any authorisation and/or license is in the name of the developer. The following fall within the responsibilities of *Dalmation Duo Investments (Pty) Ltd*:

- Be familiar with the recommendations and mitigation measures of the EMP and ensure that the contractor and all staff agree to adhere to it.
- Monitor site activities on an ongoing basis or contract the service out
- Conduct internal audits of the site
- Ensure the contractor confines their activities to within the demarcated area
- Rectify transgressions via communication with the contractor and staff and the ECO
- Appoint an ECO to ensure monthly audits are undertaken and audit reports submitted to the EDTEA.

3. THE ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The focus of the environmental management plan is to allow for the proposed refurbishment and expansion of the “*Fleetwood on Sea*” hotel whilst still protecting the environment. Particular reference is given to the following key aims:

- Ensure general protection of the receiving environment via compliance with all applicable laws, protocols and guidelines,
- Ensure that water courses and wetlands are protected,
- Prevent or minimise pollution of the receiving environment,
- Minimise disturbance of the environment and aim to protect flora and fauna,
- Prevent soil erosion and soil degradation
- Facilitate the rehabilitation of disturbed areas
- Restrict the nuisance factor by providing protocols for staff and/or vehicles

Damage to water courses, vegetation, animal life, surrounding roads (by construction vehicles), etc. may result from the proposed construction activities. Chemicals such as paints, sealants, coatings, adhesives and solvents may contaminate the soils, groundwater and watercourses should proper procedure not be followed.

3.1. Objectives of the EMP

The objectives of the EMP are to:

- Ensure compliance with local, provincial, national and/or international regulations, standards and guidelines, relating to the protection of the environment.
- Clarify roles and responsibilities of the team members
- Identify measures of mitigating any potential negative impacts thereby reducing or eliminating them

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- Provide detail on specific actions required for minimising negative impacts and provide tools or methods for monitoring the effectiveness of mitigation measures
 - Optimise positive impacts to maximise the benefit thereof
 - Provide management of concerns/complaints from I&AP's
 - Provide monitoring and auditing processes during all phases of the development.
 - Provide methods of compliance monitoring and reporting of the monitoring
 - Provide waste management, recycling and re-use strategies

3.2. Environmental Monitoring

A monitoring program to ensure compliance with the EMP will be implemented for the duration of the proposed construction. The program will include the following:

- Monthly site visits and audits (subject to the conditions of any environmental authorisation or license) which will be conducted by the Environmental Control Officer (ECO) to ensure compliance to the final EMP
- Provide corrective recommendations to rectify any non-compliance
- Compilation and submission of audit reports to EDTEA providing rating of compliance with the EMP. Any evidence of damage to areas outside the construction zone will be recorded via photographs as well as a record of the date and time of damage, type of damage and reason for damage. The contractor will be liable for damages should it have resulted from non-compliance to the EMP.
- A register of complaints from I&AP's will be opened and maintained. Complaints and concerns must be responded to immediately.

Note – The EMP has been prepared during pre-construction and must be regarded as a working document that may be updated if and when necessary. Any amendments made to the proposed construction must be submitted to the Competent Authority as an amendment to the authorisation for approval before being implemented.

3.3. Compliance with the EMP

The EMP specifies the requirements to be implemented by the developer in order to minimise and manage any potential environmental impacts. The provisions of this EMP will be legally binding to the Authorisation Holder or any authority to whom responsibility has been delegated to, for the proposed development, for the duration of the construction phase.

The EMP is legally binding to the contractors/sub-contractor(s) and must be included in the Contractual Clauses. A copy of the approved EMP must be kept on site during construction and operation. In terms of the Environmental Conservation Act and the National Environmental Management Act, those parties responsible for damage to the environment must pay the costs to repair and compensate for environmental and/or human health as well as for preventative measures to avoid or reduce further damage. The Contractor must make provisions in the budget for implementation of the EMP.

Non-compliances may result in the application of penalty(ies) following non-compliance after a written warning by the ECO. Failure to rectify non-compliances within one (1) week of the issue OR a repeat offense will result in a fine issued by the ECO.

The following rates will apply for issuing of fines:

Table 2: Fine Rates to be Applied

Offense	Fine Amount
Failure to demarcate working areas	R 1 000
Working or trespassing outside of the demarcated areas	R 3 000
Failure to strip topsoil with intact vegetation	R 5 000
Failure to stockpile topsoil correctly	R 3 000
Failure to stockpile materials in designated areas	R 1 000
Failure to implement dust suppression actions	R 1 000
Washing of vehicles on site	R 1 000
Pollution of surface or ground water	R 5 000
Failure to implement stormwater management plans	R 10 000
Failure to control stormwater runoff	R 10 000
Soil erosion	R 20 000
Failure to provide adequate sanitation	R 5 000
Failure to erect temporary fencing around trenches	R 5 000
Failure to provide adequate waste disposal facilities and services	R 5 000
Failure to re-instate disturbed areas within a specified time frame	R 5 000
Removal of protected flora without a permit to do so	Specified by DAFF
Any non-compliance of the project specifications	R 10 000

The fines will be paid by the Contractor to the Developer to be utilised in the landscaping and/or rehabilitation of the site.

3.4. Layout of the EMP

The EMP is presented in two phases namely, the construction phase and the operational phase of the project. Each phase has specific mitigation measures that address potential impacts which may be unique to that phase.

- Design and Construction Phase – This phase includes pre-construction activities including the site handover, site establishment, environmental training and access routing. The specifications of all mitigation measures, the responsibilities and the procedures for this phase must form part of the contract documentation. Hence, the relevant personnel will be required to comply with this phase of the EMP.
- Rehabilitation Phase – This phase of the EMP provides for the removal of the contractors camp, rehabilitation of the site and any disturbed areas and handover to the Client.

3.5. Training

Contractors and workers must receive basic training in environmental awareness i.e. minimisation of impacts to sensitive elements, waste management, water pollution and the requirements of the EMP.

3.6. Implementation of EMP by Contractor

The contractor must ensure that the EMP is implemented and complied with at all times. Should clarity be required the contractor must contact the ECO for advice. The ECO must provide the contractor with contact details.

3.7. Environmental File

The Environmental File comprises the following documents and must be kept on site in order to record compliance:

- Copy of any Environmental Authorisation, licenses, permits, Stormwater Management Plan, and the approved Final EMP
- Method statement for complying to the EMP,
- Record of complaints from I&AP's capturing the time, date, location and nature of complaint as well as the actions taken and by whom. The complaints register must have carbon copy pages and numbered pages.
- Emergency Response Plan and Record of emergencies and incidents
- Spill Contingency Plans
- Proof of Training
- Emergency contacts and numbers
- Material Safety Data Sheets for any hazardous substances
- Dust suppression records
- Written corrective action instructions provided by the ECO (including emails)
- Any Non-Conformance Reports (NCR) that have been issued to the contractor and/or sub-contractor(s). A Non-Conformance follows non-compliance to rectifying a problem area and must be reported to the Competent Authorities. A Non-Conformance Report typically contains the following information:
 - Details on the non-conformance,
 - Any plant or equipment involved,
 - Any chemicals or hazardous substances involved,
 - Details on the non-conforming action,
 - Nature of associated risk(s),
 - Corrective actions to rectify non-conformance, as agreed by all parties concerned,
 - Timeframes for corrective measures to be implemented,
 - Record of compliance by corrective actions, as verified by the ECO

3.8. Environmental Emergency Response plan

The Contractor is responsible for preparing an Environmental Emergency Response Plan. This is to exhibit the Contractors ability to respond appropriately to incidents that may have detrimental impacts on the environment. Such incidents include the following among others:

- Accidental spillage of hazardous substances (oil, fuels, sewage, etc.),
- Accidental toxic air emissions,
- Accidental discharges to watercourses and onto land,
- Specific impacts from accidental incidents, e.g. mass death of fish, etc.

The emergency response plan must include for the following:

- Provide actions to be taken in the event of an emergency, in the appropriate logical sequence of events,
- Emergency contact numbers,
- Roles of designated emergency response team members from the contractor's team,
- Incident recording,
- Remediation measures to be implemented,
- Information on hazardous substances, plant and equipment, including warnings and potential risks,
- Proof of emergency response training, including proof of emergency preparedness, as per legal requirements.

3.9. Method Statements

Beside the emergency response plan, the Contractor must provide the following method statements in the environmental file:

- Construction site establishment,

- Dust suppression,
- Cement mixing/concrete batching,
- Contaminated/used water,
- Erosion control and stormwater management,
- Storage, handling and decanting of fuel (diesel) and other hazardous substances,
- Bunding
- Project management including training,
- Personnel and public safety,
- Protection of fauna and flora,
- Rehabilitation of disturbed areas,
- Solid and liquid waste management,
- Top soil management including storage and re-use,
- Sourcing and Storage of materials,
- Rest and Wash areas, including toilets
- Interaction with public and stakeholders

4. RELEVANT LEGISLATION

In terms of the 2014 NEMA EIA regulations (GNR 983, 984 and 985, December 2014), a basic assessment has been conducted by an independent environmental assessment practitioner (EAP), 1World Consultants. According to the BA requirements, an environmental management plan (EMP) was formulated to address the impacts identified. The EMP endeavours to monitor, minimise and mitigate impacts identified and concerns raised by interested and affected parties and/or stakeholders.

The EMP presented covers activities authorised by the competent authority (EDTEA) only. Activities not approved must be submitted for environmental authorisation, before commencement. Should the impacts identified in the BAR be more significant than assessed, the environmental management plan must be reviewed; and updated if necessary. The EMP is not independent of the BAR, therefore both must be read in conjunction with each other.

According to Listing Notices 1, 2 and 3 (GNR 983, GNR 984 and GNR 985, of the National Environmental Management Act, NEMA – December 2014) the following activities are noted thus far:

GNR 983, Activity 19 (iii)

The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from-

(iii) a distance of 100 metres inland of the high-water mark of the sea.

The draft environmental management plan is submitted and is subject to approval by the Department of Economic Development, Tourism and Environmental Affairs. The environmental management plan is formulated to include only those aspects pertaining to the environmental authorisation. It may not have taken all the necessary legislation and regulations, pertaining to the actual development activities. The appointed project manager and/or developer must ensure adherence to the necessary legal requirements.

Examples of such legislation or regulations, amongst others, include:

- The Constitution (1996)
- Labour Relations Act (1995)

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- National Building Regulations and Building Standards Act (1977)
 - Health Act (1977)
 - National Water Act (1998)
 - Occupational Health and Safety Act (1994)
 - National public health and food hygiene regulations
 - National Water Act 1998 (Act 36 of 1998)
 - Minimisation of Shadows on Beaches Policy for eThekweni: Shadow Impacts on Beach and Residential Amenities (2008)
 - eThekweni Municipality By-Laws (current)

The EMP covers legislative requirements derived from the following:

- National Environmental Management Act (2014)
- National Water Act
- National Environment Management Act: Biodiversity Act

5. DESIGN AND PRE-CONSTRUCTION PHASES

The design and pre-construction phases include all activities that are required to render the project ready to begin construction.

5.1. Shadow Impact Assessment:		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
It is recommended that development in the coastal zone must be done with consideration to the shadow policy.	Architect/ Developer	Once
In areas where development is permitted, developers must be required to submit accurate shadow projections. This has been incorporated in the Shadow Simulations within section k of the BAR.	Architect/ Developer	Once
Shadow projections must show shadows cast by the proposed development in midwinter to assess overshadowing impacts on the beach. The Shadow Simulations found within section k of the BAR has been conducted on 21 June at 13:00; 14:00 and 15:00.	Architect/ Developer	Once
If the shadow impact assessment indicates that expected shadows lie across significant areas of the beach, such as tidal pools and bathing areas, the proposal may be required to be modified to meet the policy requirements. The findings of the Shadow Simulations can be reviewed within section k of the BAR.	Architect/ Developer	Once
Where possible, developers are required to place the tallest part of the building furthest from the beach, to the west. However, since the proposed development is the expansion and refurbishment of the existing "Fleetwood on Sea" hotel, the position of the additional levels was limited.	Architect/ Developer	Once

5.2. Authorisations, Permits and Licenses:		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
All legally required authorisations, permits and licenses must be obtained prior to commencement of construction.	Developer	Once
The Developer must appoint an EAP and/or ECO.	Developer	Once
All I&AP's and stakeholders must be notified prior to commencement of construction.	Developer/Contractor	Once

5.3. Appointment of Contractor:		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
An experience and suitably qualified contractor must be appointed.	Developer/Engineer	Once
The EMP must form part of the contractual agreements with any Contractor which must include any Sub-Contractor(s). The Contractor must take cognisance of this when budgeting during the tender process.	Developer	Once
The Contractor must comply fully with the authorisations, permits and licenses pertaining to the construction phase of the project.	Developer/Contractor	Once
Tender documents must allow for the employment of local community members.	Developer/Contractor	Once
The Contractor must provide Method Statements pertaining to implementation of the EMP, emergency response plans, stormwater management, hazardous substance handling and storage, spill contingency plans, environmental incidents records file and complaints register.	Developer/Contractor	Once
The Method Statements must be submitted to the ECO for record keeping.	Developer/Contractor/ECO	Once

5.4. Appointment of ECO		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
An independent ECO must be appointed to monitor the implementation of the EMP	Developer	Once
The Appointed ECO must monitor the project from an environmental perspective, as per the conditions of any authorisations, permits and licenses and according to the EMP. The findings of each inspection must be documented in a monthly report.	ECO	Monthly or as specified in the Authorisation

5.5. Environmental Training		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
The Contractor must receive environmental training to adequately implement the EMP.	Developer/ECO	Once
The Contractor must relay training received to all staff and sub-contractors, in a language easily understandable to them. All contractors representatives, sub-contractors and staff must acknowledge receipt of training in writing.	Contractor/SHE Officer/ECO	Once
Toolbox sessions must be scheduled and must include refreshers on environmental responsibilities.	Contractor/SHE Officer	Once

5.6. Environmental Planning and Design		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
The site must be confirmed to be within servitudes or not. If not within servitudes, the environment must be closely examined for sensitive elements in terms of flora and fauna.	Developer	Once
A suitably qualified Ecologist must be appointed to conduct a walk down of the entire site and remove sensitive elements outside the route site. This may include geophytes, aloes, discovered animals, etc.	Developer/Ecologist	Once
Any erosion control measures must be incorporated, by the engineer, into the design of the water infrastructure. These may be sandbags, hessian sheets, retention or replacement of vegetation, gabion walls, etc.	Engineer	Once
Records of relocated flora and fauna must be kept.	Ecologist/ECO	Once
A set of "before" photographs must be captured for record keeping purposes and to monitor any degradation of the environment	Contractor	Once
Ensure Stormwater Management Measures are in place	Contractor	Ongoing

5.7. Environmental Education and Training		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
<p>All site personnel must have a basic level environmental awareness training session. Topics covered must include:</p> <ul style="list-style-type: none"> What is meant by "The Environment" Why the environment needs to be protected and conserved How construction activities can impact on the environment What can be done to mitigate against such impacts Awareness of emergency and spill response provisions. Social responsibility during construction of the shopping centre e.g. being considerate of the local community who share the roads 	Contractor / ECO	Once
The ECO must provide training to the Contractor's representatives. It is the Contractors responsibility to provide the site foremen with environmental training and to ensure that the foremen have sufficient understanding to pass this information onto the construction staff. Translators may be used to ensure training is thorough.	ECO	Once

Training by the contractor must be provided to the staff members in the use of the appropriate firefighting equipment.	Contractor	Once
Environmental awareness posters on site may be used to further facilitate compliance to the EMP.	Contractor	Once
The need for a clean site policy must be explained to the workers. This includes prohibiting sanitation activities outside of the ablution facilities and toilets provided by the Contractor.	Contractor	Ongoing
Staff operating equipment (e.g. loaders, excavators, etc.) must be adequately trained and sensitised to any potential hazards associated with their tasks.	Contractor	
Although the Contractor is responsible for ensuring that the environmental awareness training of staff members is put in place, it must be the direct responsibility of the appointed ECO to carry out the training. Each staff member sign a register confirming their attendance at this training. This register must be included in the site Environmental file.	ECO	
The contractor must monitor the performance of the workers to ensure that the training was properly understood and is being followed	Contractor	
The ECO must monitor the construction phase periodically to ascertain if training was effective.	ECO	

6. CONSTRUCTION PHASE

The construction phase includes all activities on the site that are required to render the pipeline operational. Environmental training must be provided to the contractor before commencement of construction activities.

6.1. Traffic Pressures and Access		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
Routes and times of construction activities must be carefully planned. Signage indicating construction activities and vehicles must be put in place.	Engineer/Contractor	Once
Access of all construction and material delivery vehicles must be controlled, especially during wet weather	Contractor	Ongoing
Wheel washing and damping down of the unsurfaced site must be implemented to reduce dust		
Vehicles must be maintained regularly to avoid the contamination of soil from oil and hydraulic leaks etc. Maintenance must be done off site or in cases of emergency with the aid of drip trays		
Soils compacted by construction must be deep ripped to loosen compacted layers and re-graded to even running levels		
Position entry and exit points to the camp site strategically to ensure minimal impact to any traffic flow		
All equipment transported to the site must be labelled as to their potential hazards. All the required safety labelling on the containers and trucks used must be in place	Contractor	Ongoing
The Contractor must ensure that all the necessary precautions against damage to the environment and injury to persons are taken in the event of a vehicle accident.		
All staff operating vehicles to, from and within the site are required to attend a safety training session and to highlight the sensitivity of the environment on site. Safety personnel must have functional emergency first aid kits readily available and must have emergency numbers on hand in the case of an accident		

6.2. Soil Erosion and Stormwater		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
Construction vehicles must only be allowed to utilise pre-planned access routes	Contractor	Ongoing
Cement, concrete and chemicals must be mixed on an impermeable surface and provisions must be made to contain spillages or overflows into the soil		
Contaminated soils must be contained and disposed of off-site at an approved land fill site		
After the construction phase any disturbed banks must be returned to their original profiles as far as possible		
Storm water, during construction, must be controlled. All recommendations submitted by the engineers must be strictly adhered to for adequate Storm Water Management. A Storm Water Management Plan must be approved by the relevant authority. Contractors are required to follow the plan.	Engineer/Contractor	Once
Construction site must be contoured to ensure free flow of runoff and to prevent ponding of water. Runoff from the camp must be directed via temporary channels into existing municipal stormwater management infrastructure so that entry of runoff from the camp to any watercourses is avoided. Hazardous chemicals must be stored in bunded areas within the camp site to control contamination of runoff.	Contractor	Ongoing
Stream/River bank stabilisation may be employed using a variety of methods including riprap, gabion walls, reinforced concrete on river banks, asphalt paving, etc.		

6.3. Ground water Pollution		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
Adequate sanitary facilities and ablutions must be provided for the construction workers. The facilities must be serviced regularly and emptied to reduce the risk of pollution. The toilets etc. must be sufficient in number for the number of personnel on site.	Contractor	Ongoing
Use and/or storage of materials, fuels and chemicals which could potentially leak into the ground must be controlled.		
Contaminated waste water must be managed by the Contractor to ensure that the river is not contaminated.		
No washing or servicing of vehicles on site is allowed.		
Vehicles must be well maintained to prevent leakages on site. Vehicle maintenance on site is prohibited unless unavoidable, in		

which case drip trays must be used to prevent soil contamination.		
Site staff are not permitted to use watercourses for the purposes of bathing, laundry or for any construction or related activities. Municipal water (or another source approved by the ECO) must be used for activities such as washing of equipment or disposal of any type of waste, dust suppression, concrete mixing, compacting, etc.	Contractor	Ongoing
Spills that result in the contamination of ground and/or surface water must be reported immediately to DWS and the ECO.		
Specific areas must be designated for cement mixing. Care to protect the soil from contamination must be taken		
Emergency contact numbers provided by the Municipality, must be contacted in order to deal with spillages and contamination of the river		

6.4. Surface water Pollution		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
Comments from Governmental Departments and Stakeholders must be kept in consideration in order to protect the watercourse on the site. A no-go area to protect the watercourses must be demarcated. No personnel may enter this area for any reason	Contractor	Ongoing
Any hazardous substances must be stored at least 20m from any watercourses		
Contaminated waste water must be managed by the Contractor to ensure that watercourses are not contaminated		
Site staff are not permitted to use the river for the purposes of bathing, laundry or for any construction or related activities. Municipal water (or another source approved by the ECO) must be used for activities such as washing of equipment or disposal of any type of waste, dust suppression, concrete mixing, compacting, etc.		
The contractor is responsible for taking steps to ensure that littering by construction workers does not occur and persons must be employed on site to collect litter from the site and immediate surroundings		
Spills that result in the contamination of ground and/or surface water must be reported immediately to DWS and the ECO		
Emergency contact numbers provided by the Municipality, must be contacted in order to deal with spillages and contamination of the watercourses.		

6.5. Risk of alien invasive encroachment into disturbed areas		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
Protect as much indigenous vegetation as possible.	Contractor/ ECO	Ongoing
Ongoing alien plant control must be undertaken after the construction phase and during the operational phase and particularly in the disturbed areas.		
Areas which have been disturbed will be quickly colonised by invasive alien species.		
Ongoing monitoring must be conducted for the clearing/eradication of alien species. Monitor all sites disturbed by construction activities for colonisation by Contractor/ Designated Representative (i.e. Resident Engineer) and ECO.		

6.6. Flora - Damage and removal of existing indigenous vegetation		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
Alien vegetation is to be removed, should other species require removal the ECO and Biodiversity Specialist must be consulted prior to removal. A Permit from DAFF may be required. The ECO is to ensure that a list is provided of all indigenous trees / shrubs which are to be removed; this list must include the tree / shrub species and the number of each species.	Contractor/ECO	Ongoing
Any removed vegetation must be suitably disposed as soon as possible. Burning of removed vegetation on site is prohibited.		
During construction, workers must be limited to areas of need only and access to the surrounding areas must be strictly regulated and authorised. The no-go areas must be demarcated prior to construction in order to protect the watercourses and vegetation. Signposts must be erected in areas which are no-go. These areas must be demarcated with branded tape to limit access beyond.		
Collection of firewood, traditional medicinal plants and / or edible plants / fruit / seeds / vegetables is prohibited		
A designated rest area for workers must be allocated to minimise clearing of vegetation for such purposes. The contractor must ensure workers are made aware of this and that workers are not transgressing		
Disturbances of vegetation cover as well as rocky outcrops, logs, stumps, insect mounds must also be controlled by the contractor.	Contractor/ECO	Ongoing
All 'rescued trees / shrubs' must be utilised in the rehabilitation of areas affected by the project; this must be over seen by the	Contractor/ECO	

ECO and the Biodiversity Specialist.		
Prior to the clearing of sites, the ECO and the Biodiversity Specialist must ensure that all plants of conservation significance are removed; these plants may be planted in nature reserves in the eThekweni area. This may be done in consultation with the Local Municipality Environmental Management Unit.	Contractor/ECO	
Alien Invasive Plant Species found within the proposed developmental footprint, and areas which have been disturbed due to construction activities are to be removed, and areas which have been cleared / disrupted must be re-vegetated (with indigenous species) post construction.	Contractor/ECO	

6.7. Fauna - Hunting/ Fishing/ Poaching by construction workers

Actions and Mitigation Measures	Responsible Person(s)	Monitoring Frequency
Sealant, coatings, adhesives and glazing's, can be toxic to flora and fauna, if released in to the environment. Therefore, the products used must be stored and used carefully, to save resources as well as protect the environment	Contractor	Ongoing
The contractor must ensure that no animals including monkeys, snakes, scorpions, spiders are disturbed, trapped, hunted or killed during the construction phase. Fishing and/or trapping of fish is strictly prohibited.		
Safety measures, regarding workers during the construction, against venomous snakes must be taken. The snake expert's number must be easily accessible and displayed.		

6.8. Waste and littering around the site

Actions and Mitigation Measures	Responsible Person(s)	Monitoring Frequency
Litter		
Personnel must be trained in etiquette regarding littering and waste management.	Contractor	Ongoing
Closed refuse bins must be provided at strategic points to prevent accumulation of litter on-site and must be stored in sealed refuse bins which must be removed from site on a regular basis. The contractor must supply waste collection bins and skips for all manner of solid waste which must be disposed of at a registered landfill site. A certificate of disposal must be obtained by the contractor and kept on file for audit purposes.		

The contractor is responsible for taking steps to ensure that littering by construction workers does not occur and persons must be employed on site to collect litter from the site and immediate surroundings. A housekeeping team must be appointed to ensure that bins are regularly emptied and other litter is disposed of in the correct manner.	Contractor	Ongoing
Burning of solid waste on site is prohibited.		
The ECO will be monitoring the neatness of the work site and the camp site.		
Construction Rubble		
Rubble must be disposed of in a pre-agreed demarcated site in a sufficiently sized skip or vessel	Contractor	Ongoing
If debris is too large to fit in a vessel then use of an impervious mat must be made		
All debris and rubble must be regularly disposed of at a registered disposal site		
No indiscriminate spoiling of material will be allowed. All surplus or unsuitable material shall be spoiled in the local landfill site or designated areas as directed by the Engineer		
Hazardous waste		
All hazardous waste materials must be carefully stored as advised by the ECO i.e. on impervious surfaces etc. and then disposed of at a licensed landfill site.	Contractor	Ongoing
Spills must be handled immediately following spill protocols.		
A waste disposal contractor must be employed to remove any waste oil. However, maintenance of vehicles must not be conducted on site. Oil wastes must only be disposed of at licensed landfill sites designated to handle hazardous wastes. A disposal certificate must be obtained from the Waste Disposal Contractor.		
Sanitation		
The contractor must install a sufficient number of chemical toilets on site.	Contractor	Ongoing
Staff must be instructed to use the facilities provided instead of conducting indiscriminate sanitary activities on site.		
Male and female toilets must be provided if necessary and possible.		
Toilets must be 20m away from the watercourses.		
Potable water must be provided for staff.		

6.9. Noise disturbance		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
As per Regulations provided in the National Building Regulations and Building Standards Act (Act No. 103 of 1977) No. R574 of 2008, no person shall during the course of any construction use any machinery, machine, engine, apparatus, tool or contrivance, which in the opinion of the local authority may unreasonably disturb or interfere with the amenity of the neighbourhood: On a public holiday or after 17:00 on any Saturday; and Before 06:00 or after 18:00 on any day Noisy operations are not to be conducted at night Neighbours & relevant stakeholders are to be notified at least 48 hours in advance if the contractor will be working outside of this working hours	Contractor	Ongoing
Noisy operations must be scheduled with each other to limit the duration of noise		
All complaints against noise must be recorded and dealt with immediately by the contractor by adjusting schedules and/or noisy equipment or workers		
Where necessary, according to the Occupational Health and Safety Act, workers must be provided with ear protection gear		
Noise from labourers must be controlled. No loud music may be played		
Workers must not loiter around after work hours should their shift be complete.		
All vehicles and equipment must be regularly serviced to prevent the presence of noisy devices		

6.10. Air Quality		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
Dust must be controlled by wheel washing and damping down of un-surfaced areas. The contractor must use all possible measures to keep dust to a minimum to ensure no nuisance to the local community is caused.	Contractor	Ongoing
Retain vegetation as much as possible to keep dust to a minimum		
A speed limit of 20km/hr must not be exceeded on unsurfaced areas by construction vehicles		
Any valid complaints arising from dust control must be attended to immediately by the contractor		
Odours from the chemicals and paints being used must be minimised by not leaving unused/empty vessels open unnecessarily		

The contractor must have operational fire-fighting equipment on hand to stop any errant fires especially in the dry winter months	Contractor	Ongoing
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6.11. Visual Quality

Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
The site must be well maintained and neat	Contractor/ ECO	Ongoing
The contractor must adhere to project schedule in order to minimise the length of the construction period.		
The contractor must ensure that facilities such as toilets, bins, tanks and stockpiles are not left uncovered or unfenced this as this could have a negative visual impact on the community as well as potential visitors in the area and could pose a health and safety issue.		
Inspections of the site by an Environmental Control Officer are required.	ECO	Monthly

6.12. Public safety and health

Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
Unskilled labour must be trained relevantly including environmental training. Workers must receive thorough training in using potentially dangerous equipment or chemicals	Contractor	Ongoing
The ECO is not responsible for the health and safety policies of workers on site. The EMP briefly addresses this issue since the main aim of the EMP is protection of the environment and surrounds.		
Safety measures, work procedures and first aid must be implemented on site. First aid facilities must be available on site at all times. Compliance with the Occupational Health and Safety Act is the responsibility of the contractor.	Contractor	Ongoing
The contractor is responsible for ensuring that all equipment is maintained in a safe operating condition		
A safety officer must be appointed and keep records of health and safety incidents on site. Any incidents must be reported to the project manager immediately		
Protective gear such as safety harnesses, hard hats, safety shoes and other equipment must be provided by the contractor. Workers have the right to refuse work in unsafe conditions. No person may enter the site without training and appropriate protective gear		

A record of drugs administered or precautions taken and the time and dates when this was done must be kept. This can be used in court if necessary for any claims		
The contractor must ensure that workers are educated about HIV/AIDS and its risks		
Material stockpiles or stacks, such as pipes must be stable and well secured to avoid collapse and possible injury to site workers		
Eating and resting areas must be regularly serviced and cleaned to ensure hygiene		
Hazardous working areas must be marked		
Emergency numbers for local police and emergency personnel/units must be placed in a prominent area		
Trespassing and/or utilising the site as a thorough fare is prohibiting by unauthorised persons. Contractor staff are prohibited from trespassing over the site boundaries		
Interaction with neighbours and objecting parties at the site must be well documented. A complaints register must be readily available on site. Interaction with external parties must be courteous	Contractor	Ongoing

6.13. Existing Infrastructure Disturbance

Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
Contractor must provide method statements and adhere to the agreed scope of works.		
Contractors must provide project schedules that will enforce penalties for delays		
Unskilled labour must be trained relevantly including environmental training. Workers must receive thorough training in using potentially dangerous equipment or chemicals	Contractor	Ongoing
Hazardous working areas must be marked		

6.14. Social Impacts

Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
All contact with any affected parties must be courteous at all times. The objections and rights of an affected party must be respected at all times. Measures to address the objections must be dealt with in an organised manner	Contractor	Ongoing
A complaints register must be kept on site together with a copy of the final EMP. Details of complaints must be recorded and		

incorporated into the monthly audit reports. This complaints register must be maintained by the contractor and available for inspection by the ECO		
Damage to infrastructure must be rectified immediately by the contractor. A record of all damage and the remedial actions must be kept on site by the contractor and available for inspection by the ECO		
Construction workers must be clearly identifiable by wearing the contractor's uniforms. Workers must also be issued with identifications tags		
Payment of workers must comply with the applicable Labour Law Legislation in terms of minimum wages		

6.15. Closure of Construction Camp Site

- Once construction has been completed and all excess material has been removed, the camp site must be rehabilitated.
- Any spilled concrete must be removed and any soil compacted during the construction phase must be ripped, levelled and re-vegetated or surfaced.
- After all construction work is complete, the contractor is required to dismantle/detach/demolish and remove the temporary facility from site and make good to all damage, to the satisfaction of the engineer and ECO.
- All structures comprising the camp site must be removed from the site.
- The camp, storage and waste storage areas must be inspected for spills of substances such as paint, oil, etc and these must be cleaned up.
- All temporary worker facilities must be removed or decommissioned.
- Copies of all certificates from any waste disposals are to be provided to the ECO.
- Burying of any waste on site is prohibited. All waste must be disposed of at the appropriate facilities.
- The contractor must repair any damage that the construction works may have caused to neighbouring sites.
- The ECO must be notified of the complete decommissioning of the site camp after which the ECO will perform a final audit of the site.

7. REHABILITATION PHASE

The Rehabilitation Phase refers to the closing of the camp site and site handover to the Developer.

7.1. Rehabilitation		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
The Developer is responsible for compliance with the provisions for Duty of Care and Remediation of Damage in accordance with Section 28 of National Environmental Management Act (NEMA), Act No. 107 of 1998	Developer/ Contractor	Ongoing
All remaining maintenance materials, building rubble and waste are to be removed from the site. Remove all construction material from the area where construction has been completed. To be undertaken by hand.		
All disturbed surfaces compacted by maintenance activities including ablutions and storage areas must be deep ripped to a minimum depth of 30cm to allow organic contaminants to breakdown and promote vegetation establishment		
Final rehabilitation must be completed within a period specified by the Engineer		
Topsoil that has been stockpiled during construction must be applied to the area to undergo rehabilitation. The depth of the topsoil layer to be applied depends on the natural depth of topsoil in the area, and the amount of topsoil that may have been lost during construction.		Once
The naked ground may be seeded with a stabilising grass mix, suited to the conditions. The quantity of seed used will depend on the slope, with a steeper slope requiring a heavier application of seed. For slopes: <ul style="list-style-type: none"> • >15°: 25-50 kg/ha • <15°: 15-25 kg/ha 	Developer/ Contractor	Once

7.2. Employees		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
Staff must take cognisance of this EMP as well as any local Municipality Standard EMP for construction, maintenance and management.	Developer	Ongoing
Staff must abide by the mitigation measures that apply to waste management, sanitation, surface water pollution, traffic, access, soil erosion, stormwater management, protection of flora and fauna, public safety & health and the noise and disturbance factor.		
Employees must receive necessary training with regard to environmental management.		
Employees must wear uniforms, supplied by the employer.		

7.3. Management and Monitoring		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
Immediate repair operation for any damaged portion of the new infrastructure must be taken	Developer	Ongoing
Buffer zones, gabion walls, ripraps etc., must be implemented to prevent stormwater from pooling and to direct stormwater to existing stormwater infrastructure on the surrounding roads and residential area		

8. OPERATIONAL PHASE

The Operational Phase is briefly addressed and refers to the Management and Maintenance of “*Fleetwood on Sea*”.

8.1. Increased pressure on municipal water supply		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
The municipality will confirm the capacity of the existing main to satisfy the demand of the new development.	Municipality/Developer/Engineer	Ongoing

8.2. Increased pressure on electrical supply		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
eThekwini electricity will confirm the availability of the required electricity supply.	Municipality/Developer/Engineer	Ongoing

8.3. Sewage Discharge		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
The municipality is currently undertaking an exercise to ascertain the impact of the discharge from the development on the capacity of these pump stations.	Municipality/Developer/Engineer	Ongoing

8.4. Noise and Disturbance		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
All noise generating plant such as air conditioning, refrigeration, fans, etc. are to comply with noise standards.	Developer/Designated representative	Ongoing

8.5. Air Quality		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
The proposed operational phase activities will affect air quality as a result of emissions caused by exhaust fumes and dust generation. The effect on air quality is expected to be very localised and minor.	Developer/Designated Representative	Ongoing

8.6. Visual Impacts		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
All flood lighting to comply with relevant standards.	Developer/Designated Representative	Ongoing
Visual impacts are low		
The site must be kept neat and tidy always, visually pleasing		

8.7. Surface Run-off		
Actions and Mitigation Measures	Responsible Peron(s)	Monitoring Frequency
Road surfaces are recognised as a source of various pollutants which can originate from a wide variety of sources. The pollutant concentration in road runoff can be highly variable and dependant on a wide variety of factors including location, traffic volumes, extent of dry period before a rainfall event, and nature of the road surface.	Developer/Designated Representative	Ongoing
Proper management and disposal of waste must occur during the lifespan of the project, including during the operational phase. The applicant must ensure regular maintenance of all drainage systems within the road upgrade as they help in improving site drainage, and reduce pollutants entering surface waters and groundwater.		
Grass filter stripes can also be used as they function by slowing runoff velocities, trapping sediment and other pollutants and providing a modest infiltration		

9. PROPOSED MONITORING AND AUDITING

9.1. Site Audits

- The route and construction activities must be inspected during the construction and operational phases, according to the conditions of the environmental authorisation, which is generally once a month during construction.
- The date and time of the inspection may not be available to the contractor and/or developer.
- The audit must be executed by an independent environmental control officer (ECO).

9.2. Audit Methodology

- The inspection will cover all aspects stipulated in the proposed management plan.
- Each action will be assigned according to “Adequately done”, “Inadequately done” and “Not done”.
- The ECO may adjust actions should they not be effective in protecting sensitive elements or mitigating threats. This may require an amendment to the EMP and EDTEA must be consulted prior to any changes.
- Audits will be well documented in Monthly Audit Reports and submitted to the Competent Authority and the Project Manager.

9.3. Responsibility

- Ultimately, the applicant is responsible for the **implementation** of the environmental management plan.
- Should a concern be raised by an interested and affected party and/or stakeholder, EDTEA will refer to the monthly audit reports from the ECO.
- The ECO is not responsible for the implementation of the EMP but is responsible for auditing the developer’s and contractor’s compliance to the EMP.
- Following the rehabilitation of the affected site and the final ECO inspection and report, a site handover to the developer must be scheduled.

CLOSING COMMENTS

- This Draft EMP will be submitted to KZN EDTEA for approval.
- The Client’s/Contractor’s Environmental Code of Conduct, the stormwater management plan and specialist study reports must be provided as Appendices to this EMP in the Environmental File during construction.