ENVIRONMENTAL MANAGEMENT PLAN (EMP)

FOR THE CONSTRUCTION AND OPERATIONAL PHASE OF MADRASSA AN-NOOR FOR THE BLIND FACILITY PROJECT IN CEDARA, UMNGENI MUNICIPALITY

[EDTEA REF NO: DC22//0020/2017]

VERSION 1

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Acronyms Used

EDTEA	**Department of Economic Development, Tourism and Environmental Affairs**
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**

1World Consultants (Pty) Ltd has been appointed by the developer Madrassa An-Noor as the independent Environmental Assessment Practitioner (EAP), to undertake the Basic Assessment for the construction of The Madrassa An-Noor for the Blind Facility, which is located in Cedara, Umngeni Municipality, KwaZulu-Natal. Table 1 details the proposed development and specifications.

Table 1: Madrassa An-Noor Blind Facility Project Specifications

	Madrassa An-Noor for the Blind Facility Project
Ward	06
Property Description	• Property Type – ERF • Erf Number – 2 • Portion Number – 0 • Township – CEDARA • Registration Division – FT • Deeds Office - Pietermaritzburg
Development Specifications	Construction of the following: • Dormitory • Multi-purpose area • Library & Offices • Musjid • Hall • Residential units • Shed • Pool • Change room • Storage • Servants Quarters • Commercial area • Hilltop Residents
Development Final Footprint	Approximately 2.2034ha

The Madrassa An-Noor for the Blind Facility (29° 32' 2.32" S and 30° 16' 27.94" E) will be located approximately 12km from Pietermaritzburg in close proximity to the N2 highway on Cedara road, Umngeni Municipality, KwaZulu-Natal. Prominent towns in the area include Hilton and Howick. Land uses in the area include large-scale livestock and crop farming with the presence of vacant land. The development involves the construction of multipurpose buildings to meet the needs and education of the visually impair within the greater KwaZulu-Natal area.

The proposed development is located within Ward 6 of the Umngeni Municipality. The 21-digit Surveyor General (SG) number for the property affected are provided below. The coordinates for the development are also provided in Table 2.

Table 2: Site Details

Property Description	Township CEDARA, Erf 2/0
SG Number	N0FT00470000000200000
Entire Property Size	8.3673Ha
GPS Coordinates of the proposed development	29° 32' 2.32" S and 30° 16' 27.94" E

The scope and extent of the Madrassa An-Noor for the Blind facility in Cedara will comprise of bulk earthworks, concrete works, the excavation of foundations and installation of piping to connect to existing municipalities infrastructure in the area. This facility will consist of:

Table 3: Proposed Building dimensions

Proposed Facilities	**Meters**
Dormitory	15 x 78
Multi-Purpose Area	36 x 34
Library & Offices	17 x 38
Musjid	12 x 20
Hall	12 x 32
Residential Units	8 x 7
Shed	21 x 17
Pool	7 x 15
Change Room	6 x 10
Storage	10 x 12
Servants Quarters	3 x 3
Commercial Area	16 x 32
Hilltop Residents	8 x 7

Figure 1 below depicts the plans for the Proposed Madrassa An-Noor for the Blind Facility. The project will require water, electricity and waste disposal during the construction phase only. This will be provided by the Contractor.

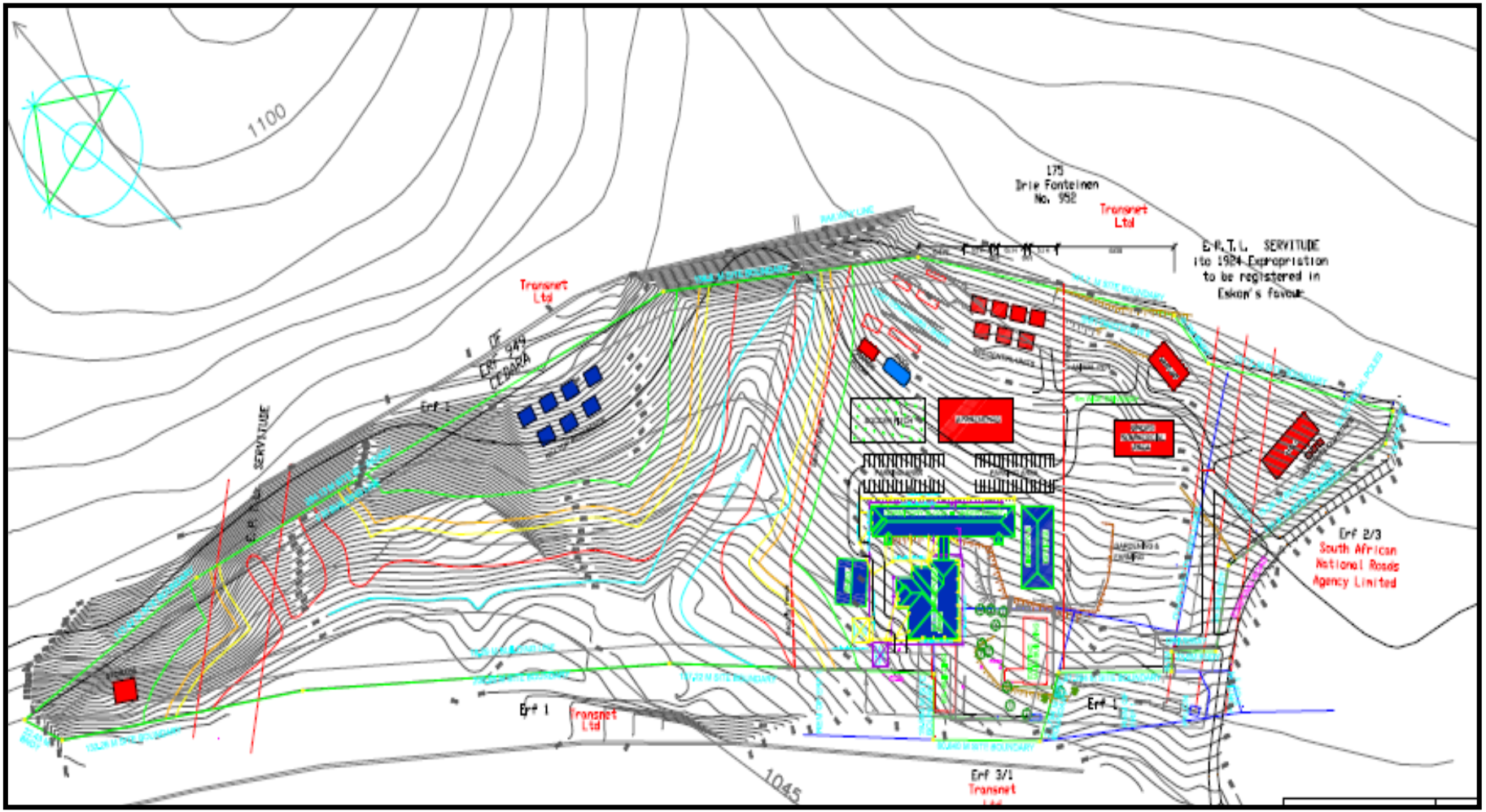

Figure 1: Plans for Proposed Madrassa An-Noor for the Blind Facility

1.2. **Points to Consider**

- Flora and Fauna in the Locality
- Wetlands and Watercourses
- Residential Zoning of the Area
    - Motor vehicle and pedestrian traffic impacts in the construction and operational phases must be considered.
    - Nuisance factor must be considered

2. PROJECT RESPONSIBILITIES

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

2.1. **Project Manager**

The Project Manager will provide the project specifications of the construction phase communicated to him through the project team. The contractor is legally bound to follow these specifications unless agreed upon by the Project Manager. The Manager 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 compliance and keep records on a monthly basis.
- Facilitate the site handover to the Contractor

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2.2. Environmental Control Officer

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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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 (eThekwini Municipality)**

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 eThekwini Municipality. The following fall within the responsibilities of the Municipality:

- 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
- Liaise with the ECO with regard to audit reports to be provided to EDTEA.

3. THE ENVIRONMENTAL MANAGEMENT PLAN

The focus of the environmental management plan is to allow for the construction of facility to cater for the visually impaired 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, surroundings 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
- 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 client 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 4: 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 2 000
Failure to implement stormwater management plans	R 2 000
Failure to control stormwater runoff	R 3 000
Soil erosion	R 3 000
Failure to provide adequate sanitation	R 1 000
Failure to erect temporary fencing around trenches	R 1 000
Failure to provide adequate waste disposal facilities and services	R 5 000
Failure to re-instate disturbed areas within a specified time frame	R 3 000
Removal of protected flora without a permit to do so	Specified by DAFF
Any non-compliance of the project specifications	R 1 000

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 rehabilitation phase of the facility. 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 contractor's 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

4.1. **Applicable Legislation and Guidelines**

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:

Listing Notice 1 (GNR 983, December 2014):

Activity 12 (x) (xii) (c): The development of-
(x) buildings exceeding 100 square metres in size;
(xii) infrastructure or structures with a physical footprint of 100 square metres or more;
where such development occurs-
(c) within 32 metres of a watercourse, measured from the edge of a watercourse;

Activity 19 (i): 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-
(i) a watercourse;

Listing Notice 3 (GNR 985, December 2014):

Activity 14 (vi)(x)(xii), (a)(c), (x)(aa): The development of-
(vi) bulk storm water outlet structures exceeding 10 square metres in size;
(x) buildings exceeding 10 square metres in size;
(xii) infrastructure or structures with a physical footprint of 10 square metres or more;

where such development occurs-
(a) within a watercourse;
(c) within 32 metres of a watercourse, measured from the edge of a watercourse; in KwaZulu-Natal:

(x) Outside urban areas:
(aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve.

Thus, a basic assessment process was necessary.

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)
- 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)

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.

Appointment of ECO	RESPONSIBILITY	OCCURRENCE	METHOD
♦ An independent ECO must be appointed to monitor the implementation of the EMP	Developer	Once	Site inspection
♦ 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	Ongoing	Site inspection

Appointment of ECO	RESPONSIBILITY	OCCURRENCE	METHOD
♦ An independent ECO must be appointed to monitor the implementation of the EMP	Developer	Once	Site inspection
♦ 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	Ongoing	Site inspection

Appointment of Contractor	RESPONSIBILITY	OCCURRENCE	METHOD
♦ An experienced and suitably qualified contractor must be appointed	Developer	Once	Site inspection
♦ The EMP must form part of the contractual agreements with any Contractor which must include any Sub-Contractor(s). The Contractor must take cognizance of this when budgeting during the tender process.	ECO	Ongoing	Site inspection
♦ The Contractor must comply fully with the authorization, permits and licenses pertaining to the construction phase of the project.			

♦ Tender documents must allow for the employment of local community members.			
♦ The Contractor must provide Method Statements pertain 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.			
♦ The Method Statements must be submitted to the ECO for record keeping	Developer/Contractor		

LAYOUT	RESPONSIBILITY	OCCURRENCE	METHOD
♦ The site selected must be approved by the ECO. If the ECO is not satisfied with the proposed site, alternative sites must be proposed and discussed with the ECO until an acceptable compromise is reached.	RE/ECO	Before construction	Site inspection
♦ Building designs should encourage the maximization of natural light, air flow and insulation.	RE	Before construction	Site inspection
♦ The extent of the storage area must be defined and all activities must be confined within this area. The ECO will be required to authorise any extension or change in location of the storage area.	RE/ECO	Before construction	Site inspection
♦ The storage area must be adequately fenced to discourage the theft of materials and equipment from the site.	RE	Before construction	Site inspection
♦ The storage area is to be maintained in a neat and orderly state at all times.	RE	Before and during construction	Site inspection
♦ Provision must be made for adequate ablution facilities.	ECO	Ongoing	Site inspection
♦ Adequate parking must be provided for site staff and visitors.	RE	During site establishment	Site inspection
♦ All servitudes and existing services to be verified prior to construction	RE	Before construction	Site inspection

♦ Development must remain outside 1:100 year flood levels including the toe of any embankments created from the building platforms.	RE	Ongoing	Site inspection
♦ Site specific geotechnical investigations must be conducted during the design and construction phases to inform founding conditions, the positioning of the sewerage treatment plant and a stormwater management plan.	RE/ECO	Before construction	Site inspection

ABLUTIONS	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Potable water must be available at all times within the construction site.	ECO	Before and during construction	Site inspection
♦ Provision must be made for the installation of tanks (Jojo) to collect rainwater for non- potable uses (garden irrigation).	ECO	During site establishment	Site inspection
♦ A reputable company, approved by the RE, must provide portable chemical toilets. Such toilets must be available for all staff.	ECO	During site establishment	Site inspection
♦ The contents of the portable chemical toilets must be transferred and disposed of by a suitable company.	RE/ECO	Ongoing	Site inspection
♦ Toilets must be no closer than 50m from any natural water body watercourses (Section 1 (24 and 29) National Water Act (36 of 1998)).	ECO	During site establishment	Site inspection
♦ The construction of long drop toilets is forbidden.	ECO	Ongoing	Site inspection
♦ Under no circumstances may open areas or the surrounding bush be used as a toilet facility.	ECO	Ongoing	Site inspection
♦ Under no circumstances may local drainage lines or streams be used as a toilet or cleaning facility by workers on site.	ECO	Ongoing	Site inspection

PROVISION FOR SITE WASTE DISPOSAL	RESPONSIBILITY	OCCURRENCE	METHOD
♦ An adequate number of waste receptacles must be available at strategic locations around the construction site for gathering all domestic refuse, and to minimise littering.	ECO	Ongoing	Site inspection
♦ Bins must be lined for efficient control and safe disposal of waste.	ECO	Ongoing	Site inspection
♦ Recycling and the provision of separate waste receptacles for different types of waste (paper, plastic, tins, glass) must be encouraged. Recyclable waste should be taken to the recycling depots near Midmar Dam and in Howick	ECO	Ongoing	Site inspection
♦ Covered waste receptacles and / or skips will be placed on site to collect waste from construction activities. It is recommended that a number of labelled containers are provided for different waste types (paper, plastic, tins, glass).	ECO	Ongoing	Site inspection
♦ The excavation and use of rubbish pits on site is forbidden.	ECO	Ongoing	Site inspection
♦ A fenced area must be allocated for waste sorting and disposal.	RE/ECO	During site establishment	Site inspection

GENERAL SUBSTANCES AND MATERIALS	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Choice of location for storage areas must take into account prevailing winds, distance from water bodies and general on-site topography.	ECO	Before construction	Site inspection
♦ Storage areas must be designated, demarcated and adequately fenced if necessary.	ECO	Before construction	Site inspection
♦ A designated working area must be constructed and must be underlain by an impermeable surface (e.g. a concrete slab or plastic lining).	ECO	During site establishment	Site inspection
♦ All handling of potentially toxic or hazardous material, and the repair, maintenance and storage of vehicles and equipment must be undertaken on the impermeable working surface in accordance with the Materials Safety Data Sheets (MSDS).	RE/ECO	Ongoing	Site inspection and review of MSDSs
♦ Fire prevention facilities must be present and easily accessible at all storage facilities.	ECO	During site establishment	Site inspection

RISKS ASSOCIATED WITH MATERIALS ON SITE	RESPONSIBILITY	OCCURRENCE	METHOD
♦ The stockpiling of soil or any other materials shall not be allowed near a watercourse or water body to prevent pollution or impediment to surface runoff. The developer must control and establish suitable mitigation measures to prevent the erosion of the stockpiles.	RE	Ongoing	Site inspection
♦ Flammable materials should be stored as far as possible from adjacent residential/ commercial areas.	RE/ECO	During site establishment	Site inspection
♦ Fire fighting equipment is to be present on site at all times in accordance with the Occupational Health and Safety Act (85 of 1993).	RE/ECO	During site establishment	Site inspection and review of OHAS
♦ Obstruction to drivers' line of sight as a result of stockpiles must be avoided, especially at intersections and on corners.	ECO	Ongoing	Site inspection
♦ Residents, tenants and land owners adjacent to the site are to be notified in advance of any known potential risks with the construction site and associated activities.	RE	Ongoing	Liaison with RE and neighbours

HAZARDOUS SUBSTANCES AND MATERIALS	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Material Safety Data Sheets (MSDS's) must be readily available for all chemicals / hazardous substances to be used on site. Where possible and available, MSDS's should include additional information on ecological impacts and measures to minimise and mitigate against any negative environmental impacts in the result of an accidental spill (refer to Appendix C).	RE	Before construction commences	Review of MSDSs
♦ Hazardous storage areas must be bunded with an impermeable liner to protect water quality. The Contractor must submit a methods statement to the RE for approval.	RE/ECO	During site establishment	Site inspection and review of methods statement
♦ Storage areas containing hazardous substances / materials must be clearly sign- posted.	ECO	During site establishment	Site inspection

♦ Staff handling hazardous substances / materials must be aware of their potential impacts and follow appropriate safety measures. Appropriate personal protective equipment (PPE) must be made available.	ECO	During staff induction / Ongoing	Site inspection, inspection of PPE and liaison with personnel
♦ The Contractor must submit a methods statement and plans for the storage of hazardous materials and emergency procedures. (Refer to Appendix D for Spill Contingency Plan).	ECO	Prior to establishment of storage area	Site inspection and review of methods statement

MATERIALS MANAGEMENT	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Contractors shall prepare a source statement indicating the sources of all materials and submit these to the RE for approval prior to the commencement of any work.	RE/ECO	On award of contract	Review of source statement
♦ A signed document from the supplier of natural materials must be obtained confirming that they have been obtained in a sustainable manner and in compliance with relevant legislation (if applicable).	ECO	On receipt of natural materials	Review of signed document

ENVIRONMENTAL EDUCATION AND AWARENESS	RESPONSIBILITY	OCCURRENCE	METHOD
♦ It must be ensured that all site personnel have a basic level of environmental awareness training. The Contractor must ensure that all construction staff are aware of the following: – What is meant by "environment"; – Why the environment needs to be protected and conserved with emphasis on the importance of and correct care of wetlands and rivers; – How construction activities can impact on the environment; – What can be done to mitigate against such impacts; – Awareness of emergency spills response provisions; and	ECO	During staff induction / Ongoing	Site inspection and staff

– Social responsibility during construction (being considerate to residents etc.).			
♦ It is the Contractors' responsibility to provide the site foreman with no less than 1 hour's environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff.	ECO	Prior to moving onto site	Site inspection and liaison with Contractor and Foreman
♦ Translators are to be used if necessary, to ensure that all staff understand what is required of them in terms of the EMP.	ECO	Ongoing	Site inspection and liaison with Contractor and Foreman
♦ The RE / ECO must be on hand to explain any technical issues and to answer questions.	ECO	Ongoing	-
♦ The need for a 'clean site' policy needs to be explained to everyone working on site.	ECO	During staff induction, followed by ongoing monitoring	Site inspection and liaison with Contractor and Foreman

WETLANDS	RESPONSIBILITY	OCCURRENCE	METHOD
♦ A "no-net-loss" approach toward the onsite wetland needs to be implemented during the planning and implementation phase of the development.	RE/ECO	Ongoing	Site inspection
♦ The following must be situated as far from any drainage lines and the wetland area and its associated buffer as possible: - Storage areas; - Portable toilets; - Hazardous storage areas; - Topsoil stockpiles.	RE/ECO	Ongoing	Site inspection

WORKER CONDUCT ON SITE	RESPONSIBILITY	OCCURRENCE	METHOD
♦ A general regard for the social and ecological well being of the site and surrounding areas is expected of the site staff. Workers need to be made aware of the following rules: – No alcohol / drugs to be allowed on site; – No firearms allowed on site or in vehicles transporting staff to / from the site; – Prevent excessive noise; – No harvesting of firewood from the site or from areas adjacent to it; – Construction staff are to make use of the facilities provided for them, as apposed to *ad hoc* alternatives; – Trespassing on private / commercial properties adjoining the site is forbidden; and – Driving under the influence of alcohol is prohibited. – Vehicles must be roadworthy and all drivers must have the appropriate license for the vehicle / plant operated.	ECO	During staff induction, followed by ongoing monitoring.	Site inspection and liaison with Contractor, Foreman and Personnel

DUST / AIR POLLUTION	RESPONSIBILITY	OCCURRENCE	METHOD
♦ The Contractor must make alternative arrangements (other than fires) for cooking and / or heating requirements. LPG cookers may be used, provided that all safety regulations are followed.	RE	Ongoing	Site inspection
♦ Measures should be taken to minimise dust creation on site.	RE	Ongoing	Site inspection

FAUNA AND FLORA	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Care must be taken to avoid the introduction of invasive plant species to the site and surrounding areas.	ECO	Ongoing	Site inspection
♦ No trees / shrubs / groundcover maybe removed or vegetation stripped without the prior permission of the ECO.	ECO	Before and during construction	Site inspection

COMMUNICATION WITH INTERESTED & AFFECTED PARTIES (I&AP's)	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Labourers for the construction phase must be sourced from nearby settlements to ensure that unemployed people are given priority for employment on the site.	RE	Ongoing	-
♦ Neighbours must be informed of the date of commencement of construction.	C	Prior to commencement of construction	Door to door visits / notice on site
♦ Neighbours must be informed of the hours of the day during which construction activities will take place. This can either take place by way of leaflets placed in post boxes giving the RE and Contractors contact details or any other method approved by the RE.	C	Prior to commencement of construction	Door to door visits / notice on site
♦ Neighbours must be notified prior to any disturbances that may occur. For example, if the electricity or water supply is to be disturbed. This can either take place by way of leaflets placed in post boxes giving the RE and Contractors contact details or any other method approved by the RE.	C	When necessary	Door to door visits / notice on site

GEOTECHNICAL INVESTIGATION	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Further investigations should be carried out prior to construction to determine the most suitable foundation option.	Contractors / RE / /Geotechnical / Structural Engineer	Pre-construction	Site inspection

VISUAL IMPACTS	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Storage facilities and other temporary structures on site should be located in such a way that they have as little visual impact on neighbours as possible.	C/ECO	During surveys, preliminary site investigations and site establishment.	Site inspection
♦ Special attention should be given to the screening of highly reflective materials on site.	ECO	During site establishment.	Site inspection

SECURITY	RESPONSIBILITY	OCCURRENCE	METHOD
♦ A security fence must be erected prior to the commencement of construction so as not to compromise the safety and security of neighbouring residents.	ECO	During site establishment.	Site inspection
♦ Building areas should be screened off using shadecloth or similar material to confine building activity and prevent unauthorised access to such building areas.	RE/ECO	During site establishment.	Site inspection

6. CONSTRUCTION PHASE

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

SITE ACCESS	RESPONSIBILITY	OCCURRENCE	METHOD
♦ The contractor is to ensure that all access roads are maintained in good working condition by attending to potholes, corrugations and storm water damage as soon as these develop.	RE/Contractor	When necessary	Site inspection
♦ If necessary, staff must clean surfaced roads adjacent to construction sites where materials have been spilt.	RE/Contractor	When necessary	Site inspection

MAINTENANCE OF THE CONSTRUCTION SITE SURFACES	RESPONSIBILITY	OCCURRENCE	METHOD
♦ To prevent stormwater damage, the increase in storm water run-off resulting from construction activities must be estimated and the drainage system assessed accordingly. A drainage plan must be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossings (siting and return period etc).	RE/Contractor	Ongoing	Site inspection
♦ Run-off from the construction site must not discharge into adjacent properties.	RE	Ongoing	Site inspection
♦ During dry periods, gravel roads shall be watered to minimise dust nuisance	RE	Ongoing	Site inspection

WASTE MANAGEMENT	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Any form of waste material and rubble generated during the construction must be disposed of at a facility registered in terms of section 20(b) of the National Environmental Management: Waste Act (Act. No. 59 or 2008), if it cannot be responsibly re-used on site or offsite.	RE	Ongoing	Site inspection
General ♦ The Contractor must identify disposal sites for the various categories of waste likely to be generated on site and must provide the ECO with documented proof of the type and volume of waste disposed of at these sites.	ECO	Weekly	Site inspection and review of waste disposal documents

♦ All waste prior to being collected for safe disposal must be stored under cover and within a designated storage area. Access to this area must be controlled.	ECO	Weekly	Site inspection and review of waste disposal documents
♦ The general cleanliness of the site and compliance with the waste disposal requirements outlined will form part of the site inspections undertaken by the ECO.	ECO	Ongoing	Site inspection
♦ Where possible, waste containers must be collected for recycling programmes provided that the original contents of the containers were not hazardous.	ECO	Ongoing	Site inspection
Domestic Waste ♦ The construction site is to be cleared of litter on a daily basis.	RE	Ongoing	Site inspection
♦ Domestic waste is to be stored in watertight, scavenger-proof and wind proof waste receptacles.	ECO	During site establishment	Site inspection
♦ Domestic waste is to be cleared on a regular basis and transferred to a permitted domestic disposal site. No domestic waste is to be buried or burned on site.	RE	Ongoing	Site inspection
Scrap Metal and Hazardous Substance Containers ♦ Scrap metal (components, sheet metal, nails, tins) must be stored in a designated scrap metal container (e.g. a skip) located at the storage area.	ECO	Ongoing	Site inspection
♦ All scrap metal is to be collected on the completion of a days work and transferred to the container.	RE	Daily	Site inspection
♦ When the scrap metal container is full, the scrap metal must either be collected by a scrap metal dealer or transferred to an appropriate disposal site.	ECO	Ongoing	Site inspection
♦ Hazardous substance containers, contaminated substrates and materials used in the clean-up of spillages must be stored in a designated, impermeable container (e.g. a skip) located at the storage area if it is not possible to remove them from the site immediately.	RE/ECO	When necessary	Site inspection
♦ The hazardous substance containers, contaminated soil, clean-up materials, etc. must be transferred to an appropriate disposal site on a regular basis.	ECO	Ongoing	Site inspection

ABLUTION FACILITIES	RESPONSIBILITY	OCCURRENCE	METHOD
♦ An adequate number of toilets must be available for the workforce (1 toilet per 20 workers). Contractors must supply toilet paper at all toilets, and will be responsible for their maintenance and servicing.	RE	During site establishment / Daily	Site inspection
♦ The ablution facilities should conform to any requirements stipulated by the Department of Health and the Local Authorities.	RE	Prior to moving onto site	Site inspection and review of DoH and Local Authority ablution stipulations
♦ The ablution facilities must be maintained in a clean and orderly state and are to be regularly cleared to prevent odour and pest problems.	ECO	Weekly	Site inspection
♦ No pit latrines are to be used.	RE/ECO	During site establishment	Site inspection
♦ Performing ablutions outside toilet facilities is prohibited.	ECO	Weekly	Site inspection
♦ Contractors must ensure that no spillage occurs when chemical toilets are cleaned and cleared and that the contents is carefully stored and transported when removing off-site. All spills must be recorded in the Environmental Incident Record Book	RE/ECO	When necessary	Site inspection

PROVISION OF WATER	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Potable water is to be sourced from an existing supply, and made available to all workers.	RE	During site establishment / Ongoing	Site inspection
♦ A dedicated source of water for dust suppression purposes must be determined during site establishment and be approved by the ECO.	C/ECO	During site establishment	Site inspection
♦ The provision of water for fire-fighting should comply with the requirements as described in SABS Code of Practice 090-1972 - Community Protection against Fire	RE/ECO	Ongoing	Site inspection

CONCRETE MIXING	RESPONSIBILITY	OCCURRENCE	METHOD
♦ If small volumes of concrete are to be mixed (manually), mixing is to be undertaken on a hard surface covered in plastic sheeting so that concrete waste and runoff can be contained.	ECO	Ongoing	Site inspection
♦ If large volumes are generated, the following requirements must be met: – Mixing area must be underlain by an impermeable surface that is sufficient to trap spills; – Runoff from the concrete mixing area is to be contained and channelled into a sump. – All concrete waste is to be collected and removed from the site for disposal at an appropriate disposal site.	ECO	Ongoing	Site inspection

FAUNA AND FLORA	RESPONSIBILITY	OCCURRENCE	METHOD
♦ All staff members are required to attend the Contractors environmental awareness training ♦ Disturbances in and around the construction site must be kept to an absolute minimum. Removal or harvesting of any indigenous vegetation must be prevented with the site and nearby areas. ♦ Hunting and catching of any animals must be prevented. ♦ Noise levels including vibrations caused by drilling must be kept to a minimum to prevent animals abandoning nearby habitats. ♦ Due to the already degraded condition of the site strict soil maintenance and topsoil management must be implemented to restrict further soil degradation. ♦ Special attention must be given to alien invasive plant species within the area and the possibility of an alien invasive management program must be considered. ♦ If the contractor envisions using or storing hazardous substances on site (oil, cement etc.) caution must be taken to prevent spills and contamination of both vegetation and soil on site. ♦ If any species of conservation importance is found on site during construction, it must be reported to the ECO and the relevant procedures must be adhered to.	ECO	During staff induction / Ongoing	Site inspection and liaison with Contractor

♦ Construction activities must be confined to the construction site only. The site must be demarcated and fenced and the contractor and all labourers must remain within this area at all times. ♦ All undeveloped areas (i.e. those outside the development footprint), and inparticular the delineated and buffered areas, must be managed appropriately.	RE/ECO	Ongoing	Site inspection and liaison with Contractor
♦ All services (electricity cable, water and sewer pipes) must be consolidated alongside roads to reduce the earthworks-associated disturbance on theproperty.	RE / ECO	During construction Phase	Site inspection
♦ It is recommended that an indigenous planting theme be followed for gardens and landscaped areas.	RE / ECO	During Rehabilitation Phase	Site inspection
♦ No indigenous or medicinal / 'muthi' plants may be collected or harvested at any stage of construction or operation, either from the property or from neighboring properties.	RE / ECO	During Rehabilitation Phase	Site inspection

NATURAL WATER RESOURCES	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Foundation are to be clearly demarcated prior to them being laid and assessed by the ECO to ensure that they follow the route of least impact and do not impact on the subsurface flow of water resources.	ECO	Ongoing	Site inspection

REMOVAL OF VEGETATION	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Site clearing activities should only be conducted immediatelyprior to construction, to reduce the amount of time topsoil is exposed, and thus the potential forerosion.	ECO	Ongoing	Site inspection

WATER QUALITY	RESPONSIBILITY	OCCURRENCE	METHOD
♦ The Contractor is to prevent the contamination of water by materials used during construction and ensure the following: – Implement measures to prevent seepage of liquid materials into ground where it could contaminate groundwater; – Ensure prompt cleaning up of accidental spillages (Section 20 of the National Water Act (36 of 1998)).	ECO	Weekly	Site inspection

♦ The Contractor is to prevent the contamination of hydrological features by diesel, grease, oil, etc. by ensuring that: – The machinery / equipment is maintained in a good operating condition; – Specially designated areas for vehicle maintenance are created; – Accidental spillages are cleaned up promptly and all contaminated material disposed appropriately.	ECO	Weekly	Site inspection
♦ Borehole quality tests must be ongoing.	ECO	To be confirmed	Site inspection

STORMWATER MANAGEMENT	RESPONSIBILITY	OCCURRENCE	METHOD
♦ It is recommended that the detailed Stormwater Management Plan be implemented on site prior to the commencement of the construction phase.	RE	-	-
♦ Stormwater Management System must allow for drainage of accumulated surface water from the platform and into specially constructed drains and from there into the natural drainage systems downslope of the site.	RE/ECO	Ongoing	Site inspection
♦ There is to be a periodic inspection of the sites drainage system to ensure that the flow of surface water is not obstructed.	RE/ECO	Monthly	Site inspection
♦ During construction, unconfined surface flow must be contained to avoid soil erosion.	RE/ECO	As surfaces become exposed	Site inspection
♦ All runoff and roof discharge must be channelled away from the buildings, and must not result in off-site pollution or result in damage to properties downstream of any stormwater discharge.	RE/ECO	Ongoing	Site inspection
♦ All earthworks must be carried out in accordance with the guidelines stipulated in SABS 1200 (current version).	RE/ECO	Ongoing	Site inspection
♦ To reduce the possibility of soil erosion, the resurfacing of newly cleared vegetated areas must take place immediately after vegetation has been removed.	RE/ECO	Ongoing	Site inspection

♦ Suitable erosion control methods must be implemented in areas sensitive to erosion. These measures could include: – The suitable use of sand bags or Hessian sheets. – The prompt rehabilitation of exposed soil areas within indigenous vegetation to ensure that soil is protected from the elements. – The removal of vegetation, only as it becomes necessary for work to proceed. – Prevent the unnecessary removal of vegetation especially on steep slopes. – All the necessary precautions in terms of design and construction of earthworks, cuts and fills must be	RE	Ongoing	Site inspection
♦ Erosion control structures must be installed to all stormwater outlets from internal stormwater pipes (including runoff from roads and buildings).	RE	Ongoing	Site inspection
♦ Stormwater Management in the wetland area – the discharge of stormwater runoff must be managed by implementing the following: - Multiple discharge points, outside the buffer zone, which are reasonably spread out across the development adjoining the wetland habitat; - Flow through the buffer zone should be via diffuse flow and concentrated flow should be avoided. - Accompanying each discharge point should be suitable baffle structures (e.g. gabion mattresses) that will dissipate the energy of storm flow and encourage infiltration thus reducing the likelihood of erosion; - The runoff entering the buffer zone should not exceed 1.5m/sec as this is considered to reduce the pollutant removal performance of the buffer area; - Outflow points need to incorporate a best management practice approach to trap excess suspended solids and other pollutants originating from the proposed development before entering the freshwater ecosystems.	RE/ECO	Ongoing	Site inspection

WETLAND MANAGEMENT	RESPONSIBILITY	OCCURRENCE	METHOD
♦ To improve the overall functionality and integrity of the wetland, all impoundments including berms and the small dam wall need to be removed.	RE/C/ECO	During construction	Site inspection
♦ The erosion gully within the wetland must be stabilised by utilising appropriate engineering solutions/interventions.	RE/C/ECO	During construction	Site inspection
♦ A minimum buffer of 20m should be clearly demarcated and implemented.	RE/C/ECO	Ongoing	Site inspection
♦ The following must be situated as far away from the wetland/watercourse as possible: - Storage areas; - Portable toilets; - Hazardous storage areas; and - Top soil stockpiles – also not across any drainage lines.	RE/C/ECO	During construction	Site inspection

WEED CONTROL	RESPONSIBILITY	OCCURRENCE	METHOD
♦ The Contractor is to control and eradicate the spread of alien weeds during the project. (refer to Appendix E).	ECO	Ongoing	Site inspection
♦ Alien plants that have been removed must be discarded at an appropriate refuse site. Should alien vegetation have seeds, it should be transferred to the storage area where it can be burned in a controlled manner.	ECO	When required	Site inspection

SOIL EROSION	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Once the site has been cleared of vegetation, the top layer of soil (150mm) should be removed and stockpiled in a designated area.	RE/C/ECO	Ongoing	Site inspection
♦ Soil erosion on site must be prevented at all times i.e. pre-, during-, and post- construction activities.	ECO	Ongoing	Site inspection
♦ Erosion control measures to be implemented in areas sensitive to erosion such as near water supply points, edges of slopes, etc. These measures can include the use of sand bags, hessian sheets, retention or replacement of vegetation	ECO	Ongoing	Site inspection
♦ The entire site must not be cleared of vegetation before construction commences, ensuring that exposed areas are kept to a minimum, wherever possible.	C/ECO	Ongoing	Site inspection

♦ Top-soiling and re-vegetation shall commence immediately after the completion of a construction activity.	C/ECO	On completion of each phase	Site inspection
♦ Stormwater management and wind screening must be undertaken to prevent soil loss from the site.	RE/C/ECO	Ongoing	Site inspection
♦ Battering of all banks shall be such that cut and fill embankments are no steeper than the previous natural slopes unless otherwise permitted by the ECO. Cut and fill embankments steeper than the original ground levels are to be re-vegetated immediately on completion of trimming. Alternatively cut and fill embankments are to be protected against erosion using bioengineering stabilisation measures.	C/ECO	As cut and fill activities are completed	Site inspection
♦ All steep embankments shall be protected by a cut-off drain to control surface flow and prevent erosion.	C	Immediately after the creation of the embankment.	

SOIL HANDLING	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Soil must not be handled when it is wet as this will result in unnecessary compaction.	C	When necessary	Site inspection
♦ Repeated handling of soil must be avoided as this results in compaction and the loss of soil structure.	C/ECO	Ongoing	Site inspection
♦ In order to minimise the risk of spillage and loss through wind erosion, trucks transporting soil must not be overloaded when conveying soil to and from the site.	C	Ongoing	Site inspection
♦ Soil being transported long distances must be covered with a tarpaulin.	C	Ongoing	Site inspection

STOCKPILE MANAGEMENT	RESPONSIBILITY	OCCURRENCE	METHOD
General Guidelines Stripping soil is to be stockpiled so that it can be used in the rehabilitation process.	RE/ECO	Ongoing	Site inspection
♦ Soil that is to be stockpiled for an extended period must be stored: – In a sheltered site where it will not be exposed to the effects of wind erosion; – Outside the working area where it will not be disturbed or contaminated.	ECO	When necessary	Site inspection
♦ Topsoil (top 200 mm) is not to be mixed with subsoil.	ECO	When necessary	Site inspection

♦ Soil is not to be stockpiled against tree trunks as this will encourage ant infestations.	ECO	Locate as directed by the ECO	Site inspection
Stockpile Maintenance ♦ Stockpiles are to be protected from wind and water erosion: ♦ Short-term stockpiling (less than 3 weeks) - erosion control measures will not need to be implemented; however, limitations on the area to be cleared will apply; ♦ Medium-term stockpiling (more than 3 weeks) - stockpiles must be covered with biomatting; ♦ Long-term stockpiling (more than 2 months) - stockpiles must be re-vegetated by hydro- seeding or sowing with an appropriate grass / legume mix.	ECO	Weekly	
♦ The colonisation of stockpiles by invasive plants must be controlled by removing the plants when they germinate. The purpose of this is to reduce the risk of developing a seedbank of invasive species within the stockpiled soil.	ECO	Monthly	Site inspection

DUST / AIR POLLUTION	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Appropriate dust suppression measures must be used when dust generation is unavoidable (dampening).	RE	Ongoing	Site inspection
♦ No fires are allowed on site.	RE	Ongoing	Site inspection
♦ Vehicles and machinery are to be kept in good working order and to meet manufacturers specifications for safety, fuel consumption etc.	ECO	Ongoing	Site inspection
♦ Areas to be utilised by heavy machinery must be clearly demarcated and a responsible person assigned to ensure that the EMP is fully complied with.	RE/ECO	Ongoing	Site inspection
♦ Should excessive emissions be observed, the Contractor is to have the equipment seen to as soon as possible. ♦ All vehicles should comply with speed limits on the access roads. Vehicles should be properly maintained and regularly serviced to ensure that exhaust emissions are controlled.	RE	As directed by the RE	Site inspection
♦ The construction site should be periodically dampened to reduce the impact of dust. Soil stockpiles should be covered or grassed, if they are likely to be present on site for periods longer than 3 months.	RE	Ongoing	Site inspection

HAZARDOUS SUBSTANCES	RESPONSIBILITY	OCCURRENCE	METHOD
♦ The handling and storage of hazardous materials must be in accordance with the MSDS and must be restricted to the storage area as the appropriate pollution control measures will need to be in place. If additional areas / sites are required for the storage or handling of hazardous substances, they must be assessed and approved by the ECO who will then instruct the Contractor to implement the appropriate controls.	RE/ECO	Before construction commences / as additional hazardous are required	Site inspection
♦ No fuels are to be stored on the site.			
Inventory of Substances ♦ The Contractor must compile an inventory of all hazardous substances to be used and stored on the site, and must ensure that they know the effects of these substances on their staff and the environment. A copy of this inventory must be supplied to the RE and ECO.	RE/ECO	Before construction commences and as additional hazardous are required	Review of inventory
Handling and Storage ♦ The Contractor must ensure that the quantities of chemicals stored on site are appropriate for his / her requirements, and must also ensure that they are appropriately stored and handled so as to minimise the risk of spills.	ECO	Ongoing	Site inspection
♦ All chemicals must be confined to specific and secured areas that have to be approved by the ECO.	ECO	During site establishment / Ongoing	Site inspection
♦ Chemicals must be stored in a bunded area with an impermeable base, which is capable of containing 110% of the bunded material. An impermeable surface could be created by i) placing a layer of clay beneath plastic sheeting ii) placing soil on top of plastic sheeting. When the impermeable surface is no longer required, the plastic sheet along with the contaminated soil must be disposed of off-site at a registered landfill (New England).	ECO	Ongoing	Site inspection
Spills of Hazardous Substances ♦ The accidental or negligent spillage of any fuels or potentially hazardous substances must be cleaned up immediately using the most appropriate methodologies, equipment and materials.	RE	When necessary	Site inspection
♦ The Contractor must ensure that the necessary materials, equipment and chemicals are available on the site to deal with spills of any of the hazardous materials present (e.g. Drizit).	RE/ECO	During site establishment	Site inspection

♦ The Contractor must devise a procedure for dealing with accidental spills, which has to be approved by the ECO. The procedure must distinguish between those spills that can be cleaned up by the Contractor and those that will require specialist input. The name and contact numbers of various clean up companies must be posted and visible at the camp office. This procedure must also include a provision to notify the Resident Engineer and ECO of any spills.	ECO	Prior to moving onto site	Review of procedures and poster
♦ Any contaminated soil or water must be removed and stored in a skip until it can be disposed of at an appropriate disposal site.	ECO	When necessary	Site inspection
Recording of Incidents ♦ The Contractor must provide an Environmental Incident Record Book on site to record the details of any environmental incidents (date, time, cause, action taken). This book will be regularly checked by the ECO who will also cross reference the entries with observations made during site visits.	ECO	Prior to moving onto site / Ongoing	Review of Incident Record Book

EQUIPMENT / MACHINERY	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**
♦ The Contractor must store all equipment that may leak on an impermeable surface, with watertight drip trays to catch any pollutants.	ECO	Ongoing	Site inspection
♦ The drip trays must be cleaned regularly, and must not be allowed to overflow.	RE/ECO	Ongoing	Site inspection
♦ Chemicals collected in the drip trays must be collected and disposed of in an appropriate manner (MSDS).	RE/ECO	Ongoing	Site inspection

PERSONAL SAFETY	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**
Hard Hats ♦ The following personnel are required to wear hard hats: – All persons within 10m of any situation where any form of lifting or hoisting equipment is being undertaken; – Any personnel working in any other situation where possibility of head injury is present.	RE/ECO	Ongoing	Site inspection and review of PPE

Protective Gloves ♦ Protective gloves are to be worn by all persons engaging in the following: – Handling of heavy or sharp edged materials; – Welding or gas cutting activities; – Handling of corrosive chemicals.	RE/ECO	Ongoing	Site inspection and review of PPE
Safety Footwear ♦ All persons entering the active working area must wear approved safety boots.	RE/ECO	Ongoing	Site inspection and review of PPE
Safety Goggles ♦ The following persons must wear safety goggles at all times: – Persons operating equipment under dusty conditions; – Persons engaged in cutting or welding activities; – Persons engaged in grinding activities; – Persons handling hazardous chemicals.	RE/ECO	Ongoing	Site inspection and review of PPE

DISRUPTION OF INFRASTRUCTURE AND SERVICES	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**
♦ Should the construction staff be approached by members of the public or other stakeholders, they are to assist them in locating the RE or Contractor.	RE	Ongoing	-
♦ The Contractor is to inform surrounding residents and businesses of disruptive activities at least 24 hours in advance. This can either take place by way of leaflets placed in post boxes giving the RE and Contractors contact details or any other method approved by the RE.	RE/ECO	At least 24 hours before the activity is to take place	Liaison with Contractor, RE and neighbours

VISUAL IMPACTS	RESPONSIBILITY	OCCURRENCE	METHOD
♦ The site is to be kept clean at all times to minimise the visual impacts of thesite.	ECO	Weekly	Site inspection
♦ Lighting of the site should be pointed downwards and away from oncoming traffic and surrounding properties to minimise the visualintrusion.	ECO	During site establishment	Site inspection

HERITAGE AND PALAEONTOLOGICAL IMPACTS	RESPONSIBILITY	OCCURRENCE	METHOD
♦ For any chance finds, such as grave sites, all work will cease in the area affected and the Contractor will immediately inform the Project Manager. A registered heritage specialist must be called to site for inspection. The relevant heritage resource agency (Amafa) must also be informed about the finding. ♦ Written permission must be obtained from Amafa if heritage resources, including graves, are to be removed, destroyed or altered. ♦ If heritage resources found in close proximity to the construction area to be protected by a 3m buffer in which no construction can take place. The buffer material (danger tape, fencing, etc.) must be highly visible to construction crews. ♦ Under no circumstances may any heritage material be destroyed or removed from site unless under direction of a heritage specialist. ♦ Amafa requires that the developer engages the services of a palaeontologist to assess areas where foundations will go to depths of 1.5m or more and for areas where bedrock is exposed. The developer, construction team and ECO should therefore ensure that Amafa is notified should subsurface material be encountered during earth-moving as there is a possibility of unearthing faunal remains, archaeological and historical material such as railway heritage related objects. ♦ If there are chance finds of fossils during construction, work in the area of the find must be stopped and a palaeontologist must be called to the site in order to assess the fossils and rescue them if necessary (with an Amafa permit). The fossils must then be housed in a suitable, recognized institute.	C/ECO	Ongoing	Site inspection

SOCIAL IMPACTS	RESPONSIBILITY	OCCURRENCE	METHOD
Noise Impacts ♦ Construction vehicles, building contractors and labourers must be limited to working hours between 7.30 am and 5 pm. Construction on weekends and public holidays should not be permitted in order to minimise the impact on surrounding residents.	ECO	Prior to moving onto site	Site inspection
♦ Machinery and equipment must be maintained and regularly serviced to ensure that unnecessary noise is prevented. Workers on site must not create unnecessary noise such as hooting or shouting. All construction labourers must remain within the boundaries of the construction site at all times. In order to ensure this, it is recommended that the entire property be fenced at the start of the construction phase, to prevent labourers trespassing onto neighbouring properties.	ECO	Prior to moving onto site	Site inspection
♦ Equipment fitted with noise reduction facilities will be used as per operating instructions and maintained properly during operations.	ECO	Ongoing	Site inspection
Visual Impacts ♦ Special attention should be given to the screening of highly reflective materials on site.	ECO	During site establishment	Site inspection

STAFF CONDUCT	RESPONSIBILITY	OCCURRENCE	METHOD
♦ The Contractor must monitor the performance of construction workers to ensure that the points relayed during their induction have been properly understood and are being followed. If necessary, the ECO and / or a translator is to be called onto site to further explain aspects of environmental or social behavior that are unclear.	RE/ECO	Ongoing	Site inspection and liaison with Contractor

DAMAGE TO PROPERTY AND STRUCTURES	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Damage to structures and fences on private property must be avoided as far as possible.	RE	Ongoing	Site inspection
♦ Should damage to the aforementioned occur, the Contractor will be responsible for repairing the damage caused or compensating the property owner accordingly.	RE	Ongoing	-
♦ Any fencing removed to enable construction to proceed must be replaced on completion of work in that area.	RE	Ongoing	Site inspection

COMMUNICATION WITH INTERESTED & AFFECTED PARTIES (I&AP's)	RESPONSIBILITY	OCCURRENCE	METHOD
♦ The RE and Contractor are responsible for ongoing communication with all I&AP's.	RE/ECO	Ongoing	Liaison with Contractor and RE
♦ A complaints register is to be located at the site office. The Contractor must account for any missing pages. This register is to be tabled during regular site meetings.	ECO	Monthly	Site inspection and review of Complaints Register
♦ Queries and complaints are to be handled by: – Documenting details of such communications; – Submitting these for inclusion into the complaints register; – Brining issues to the immediate attention of the RE; and – Taking remedial action as per the RE and / or ECO's instructions.	ECO	Ongoing	
♦ Selected staff are to be made available for formal consultation with I&AP's in order to: – Explain the construction process; and – To answer any questions.	ECO	Ongoing	Liaison with Contraction and RE

FIRE PROTECTION	RESPONSIBILITY	OCCURRENCE	METHOD
♦ A sufficient number of fire hydrants for the number of units on site must be installed. The water pressure within the hydrants must be of suitable pressure to be used for firefighting purposes.	RE/ECO	Ongoing	Site inspection
♦ All buildings must be equipped with adequate emergency fire extinguishers (fire safety regulations and insurance requirements must be consulted in determining this).	RE/ECO	Ongoing	Site inspection
♦ As required by law (National Veld and Forest Fire Act, No 101 of 1998), firebreaks must be maintained on the property boundaries.	RE/ECO	Ongoing	Site inspection
♦ A dedicated on-site water storage facility for emergency firefighting must be established.	RE/ECO	Ongoing	Site inspection

SOILS & BUILDING RECOMMENDATIONS	RESPONSIBILITY	OCCURRENCE	METHOD
♦ All vegetation should be cleared from the areas over which fills are to be built or where cuts are to be made.	RE	During construction	Site inspection
♦ The upper 200mm of topsoil should be removed and stockpiled, to be used to rehabilitate the site after the construction phase of the work is complete.	RE	During construction	Site inspection
♦ Cuts and fills should be limited to a maximum height of 2.0 metres to promote their stability.	RE	During construction	Site inspection
♦ Embankments, foundations & fill construction: - The fills should be placed in layers not exceeding 200 mm loose thickness, and compacted to a minimum of 93% Modified AASHTO maximum dry density. - Any boulders or material larger than two-thirds of the layer thickness must not be included in the fill material. - Material should be worked within - 2% to +2% of the optimum moisture content reduce the danger of heave during compaction	RE	During construction	Site inspection
♦ Should material (soils) of less than G10 quality be encountered this will need to be undercut and replaced with material of G8 quality if available and re-compacted to 93 percent Modified AASHTO density. The geotechnical report recommends additional laboratory testing is carried out to confirm the initial findings.	RE	During construction	Further laboratory testing
♦ Due to possible condition variance in the Geotechnical test pits, it is recommended that Geozone carry out periodic inspections of the sites during construction to ensure that any variation from the anticipated ground conditions can be taken into account to avoid unnecessary delays and expense – this should be treated as an augmentation of the Geotechnical investigation.	RE/Geozone	During construction	Site inspection

7. DECOMMISSIONING

In the tables that follow, Resident Engineer, Environmental Control Officer, and Senior and Supervisory Staff have been abbreviated to RE, ECO and SSS respectively.

POLLUTION CONTROL STRUCTURES	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Break up all brick and concrete structures and remove waste to an appropriate disposal site (unless the material is proposed to be used as fill material for a new development). If this is the case, this material must be stored appropriately (stockpiles must not be over 3 metres).	RE	During decommissioning	Site inspection

WASTE	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Remove leftover materials from the site and either sell, auction, donate to the local community or transfer to the Contractor's base for appropriate disposal.	RE	During decommissioning	Site inspection
♦ Any construction debris, litter and domestic waste from the construction site during decommissioning must be transfer to an appropriate disposal site.	RE	During decommissioning	Site inspection
♦ Do not burn any waste on site – all waste is to be transferred to a permitted disposal site (Curry's Post).	RE/ECO	During decommissioning	-

ALIEN VEGETATION	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Existing alien vegetation must be removed from the entire property. During this process, it is imperative that indigenous vegetation is not removed or disturbed.	RE/ECO	Ongoing	Site inspection

EROSION	RESPONSIBILITY	OCCURRENCE	METHOD
♦ After decommissioning, bare soil must not be left exposed. If further development is not taking place within a week, exposed areas must either be dampened and covered with plastic, or planted with quick growing vegetation.	RE	After decommissioning	Site inspection

8. POST-CONSTRUCTION AND REHABILITATION

Site rehabilitation is an essential component of this EMP and must be carried out in conjunction with the ECO. The guideline is to be used as the basic structure for the site rehabilitation; the specific details must be decided by the RE and / or Developer in conjunction with the ECO. This applies most specifically to the soil replacement and re-vegetation components.

The requirements for the control of soil, water, dust and noise pollution stipulated in this EMP still applies during the site rehabilitation phase of the project. Similarly, the requirements for soil management, erosion control, alien vegetation removal and vegetation and fauna protection also apply.

POLLUTION CONTROL STRUCTURES	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Excavate all areas of contaminated substrate, transfer the contaminated substrate to an appropriate disposal site and treat the affected areas with appropriate ameliorants.	RE	On completion of the project	Site inspection
♦ Remove all plastic linings used for pollution control and transfer to an appropriate disposal site.	RE	On completion of the project	Site inspection
♦ Break up all concrete structures that have been created (e.g. working and parking surfaces) and remove concrete waste to an appropriate disposal site.	RE	On completion of the project	Site inspection

WASTE	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Remove all leftover construction materials from the storage area and construction site and either sell, auction, donate to the local community or transfer to the Contractor's base.	RE	On completion of the project	Site inspection
♦ Remove all construction debris, litter and domestic waste from the construction site and transfer to an appropriate disposal site. Remove all waste receptacles and either donate to the local community, auction, or transfer to Contractor's base.	RE	On completion of the project	Site inspection
♦ Do not burn or bury any waste at the construction site – all waste is to be transferred to a permitted disposal site.	RE/ECO	On completion of the project	-

ALIEN VEGETATION	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Existing and newly established alien vegetation, such as American Bramble and Eucalyptus found onsite, must be removed from the entire property and replaced, where necessary, with suitable indigenous / endemic plant species. During this process, it is imperative that indigenous vegetation is not removed or disturbed.	RE/ECO	Ongoing	Site inspection
♦ Only indigenous species should be used for landscaping. No exotic plants are to be introduced.	RE/ECO	Ongoing	Site inspection

REVEGETATION	RESPONSIBILITY	OCCURRENCE	METHOD
♦ The site must be graded to ensure free flow of runoff.	C	On completion of construction	Site inspection
♦ All areas of bare soil must be re-vegetated and rehabilitated.	C/ECO	On completion of construction	Site inspection
♦ It is important that the re-vegetation activities be planned in advance to ensure that seed and plant stockists are able to supply the required volume when required.	RE	On completion of construction	Site inspection
♦ Only indigenous and preferably endemic plant species will be permitted on site.	ECO	During rehabilitation phase.	Site inspection
♦ All re-vegetated areas will need to be watered to ensure plant growth and development.	C/ECO	Ongoing.	Site inspection

STORMWATER MANAGEMENT	RESPONSIBILITY	OCCURRENCE	METHOD
♦ The Site must be contoured to ensure free-flow of runoff and to prevent ponding of water.	C/ECO	On completion of construction	Site inspection

INFRASTRUCTURE	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Disassemble all infrastructure units and remove components from the working and storage areas. This will include temporary office and storage structures and containers, water supply pipelines, water storage containers, waste storage containers, power supply, etc.	RE/C/ECO	On completion of construction	Site inspection
♦ Drain all portable chemical toilets, with no spillage of the contents. Transfer the contents to an appropriate disposal site.	C	On completion of construction	Site inspection
♦ Drain all wastewater and sewage associated with the temporary ablution facilities and transfer the waste to an appropriate sewage treatment works.	C	On completion of construction	Site inspection
♦ Disassemble all fencing around the camp and either sell, auction or donate the components to the local community or transfer the waste components to a disposal site or the contractor's base.	C	On completion of construction	Site inspection

9. OPERATIONAL PHASE

The Operational Phase is briefly addressed and refers to the Management and Maintenance of Madrassa An-Noor for the Blind.

Traffic and Access	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Access for vehicles will be limited to residents and approved visitors.	Developer/ Designated Representative	Ongoing	Management and Maintenance
♦ All residents and approved visitors shall be made aware of the directions and speed limits through road signage.			
♦ Access roads to the site that are within protected areas shall have reasonable maximum speed limits to reduce the risk of accidents involving animals.			
♦ The developer Investments should ensure that access roads are maintained in good condition by attending to potholes, corrugations and stormwater damage as soon as these develop.			
♦ The Developer shall ensure that all the necessary precautions against damage to the environment and injury to persons from traffic on site are taken in the event of an accident.			

Erosion Management	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Madrassa rules shall include measures to ensure residents do not unnecessarily clear land of vegetation or dispose of large volumes of water, which could cause erosion at any time.	Developer/ Designated Representative	Ongoing	Management and Maintenance
♦ The developer will be required to re-vegetate any disturbed surfaces around their properties.			
♦ Madrassa rules must state that no residents or visitors are to traverse the banks of the wetland on steep sections susceptible to erosion.			
♦ Residents must not be allowed to create new paths, roads or potential erosion hazards without written permission of the Madrassa/ Developer.			
♦ Stormwater control (i.e. gabions, sandbags, etc.) should be undertaken timeously to prevent soil loss from the where erosion is identified.			

Groundwater Management	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Use and or storage of materials, fuels and chemicals which could potentially leak into the ground must be controlled.	Developer/ Designated Representative	Ongoing	Management and Maintenance
♦ Any hazardous substances must be stored at least 100m from the wetland on site.			
♦ The developer/ management should be responsible for ensuring that potentially harmful materials are properly stored in a dry, secure, ventilated environment, with concrete or sealed flooring and a means of preventing unauthorised entry.			
♦ Residents, visitors and staff shall not be permitted to use any other open water body or natural water source adjacent to or within the designated site for the purposes of bathing, washing of clothing or for any related activities.			
♦ 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.			
♦ 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.			

Hydrology and Stormwater Management	RESPONSIBILITY	OCCURRENCE	METHOD
♦ The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids, silt or chemical pollutants.	Developer/ Designated Representative	Ongoing	Management and Maintenance
♦ Earth, stone and rubble is to be properly disposed of so as not to obstruct natural water path ways over the site. These materials must not be placed in stormwater channels, drainage lines or rivers unless part of an approved anti erosion program.			
♦ There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.			

Noise and Disturbance	RESPONSIBILITY	OCCURRENCE	METHOD
♦ All noise generating plant such as air conditioning, refrigeration, fans, etc. are to comply with noise standards. ♦ Residents must aim to adhere to the relevant noise regulations and limit noise on site to reduce disturbance of neighbors.	Developer/ Designated Representative	Ongoing	Management and Maintenance

Air Quality	RESPONSIBILITY	OCCURRENCE	METHOD
♦ Retention of vegetation where possible will reduce dust travel. ♦ A speed limit of 20km/h must not be exceeded on dirt roads around the site. ♦ The Madrassa shall attend to any complaints or claims emanating from the lack of dust control immediately. ♦ The effect on air quality is expected to be very localised and minor.	Developer/ Designated Representative	Ongoing	Management and Maintenance

Visual impacts	RESPONSIBILITY	OCCURRENCE	METHOD
♦ All flood lighting to comply with relevant standards. ♦ Visual impacts are considered to be low.	Developer/ Designated Representative	Ongoing	Management and Maintenance

Waste Management	RESPONSIBILITY	OCCURRENCE	METHOD
♦ All wastewater from general activities in the Madrassa shall be collected and removed from the site for appropriate disposal at a licensed commercial facility. This is the responsibility of the developer. ♦ A waste collection point must be - established away from the 1:100 year flood line - built on a hardstand surface (e.g. concrete) - Enclosed to prevent access by scavengers/vermin which may result dispersal of waste.	Developer/ Designated Representative	Ongoing	Management and Maintenance

10. PROPOSED MONITORING AND AUDITING

10.1. 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).

10.2. 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.

10.3. Responsibility

- Ultimately, the client (eThekwini Water and Sanitation) 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.