

PROPOSED DEVELOPMENT OF A REGIONAL STORMWATER POND AT FISANTEKRAAL, CAPE TOWN

ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

December 2021

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Name of the Company

December 2021

Date

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Terminology

The following abbreviations are used in this report:

Abbreviations	Description
BA	Basic Assessment
BAR	Basic Assessment Report
CA	Competent authority
DEA&DP	Department of Environmental Affairs and Development Planning
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EMC	Environmental Management Consulting
EMPr	Environmental Management Programme
FIA	Freshwater Impact Assessment
FMP	Fire Management Plan
GNR	Government Notice Regulation
HWC	Heritage Western Cape
I&APs	Interested and Affected Parties
NEMA	National Environmental Management Act, (Act No 107 of 1998)
NHRA	National Heritage Resources Act, Act 25 of 1999
NWA	National Water Act
SAHRA	South African Heritage Resources Agency
SDP	Site Development Plan

1 ACTIVITY INFORMATION

1.1 Introduction

The Environmental Management Programme (EMPr) outlines the procedures that control the way the Applicant¹, Dexter Estates (Pty) Ltd., the Project Manager and the Contractors appointed for the various construction and operational phase activities shall conduct himself/ herself/ themselves whilst undertaking the development of the proposed regional stormwater pond (Pond B4) in Fisantekraal.

The EMPr covers the spectrum of pre-construction, construction, and operation phases, and incorporates the recommendations of the Basic Assessment Report (BAR) and specialist studies in respect of the various actions that need to be taken to avoid / minimise / mitigate potential adverse impacts and enhance potential beneficial impacts of the project.

The EMPr describes impact management outcomes and impact management actions that need to be implemented during the various phases of the proposed project, including the careful implementation and management of the various proposed activities on the property from conception to implementation. The focus is usually placed on the activities to occur on the application properties; however, consideration of the adjacent or receiving environment (socially and ecologically) is equally important.

The impact management actions represented in this EMPr should not be regarded as static measures, but rather as procedures that can be adapted, as and when site conditions require. This EMPr sufficiently serves to provide the most practicable methods to promote sound environmental management during the construction and operational phases of the development. The EMPr subsequently is an on-site working and dynamic document.

This EMPr must be read in conjunction with the BAR and the conditions of authorisation that the Department of Environmental Affairs and Development Planning (DEA&DP) is likely to put forward should authorisation be granted. In the unlikely event of any conflicting responsibilities or procedures, the precautionary principle must be adopted. Hard copies of the aforementioned documents should be kept on site along with the EMPr.

The EMPr is a fundamental element of the management process that is aimed at ensuring the environmental sustainability of the proposed development. The implementation of the EMPr will also aim to ensure that the conditions of approval laid down by the competent authority will be met. It is imperative for the EMPr to be actively implemented and used at all management levels as an integral part of the project. It is equally important to revise the EMPr in accordance with information that becomes available from the monitoring processes during the construction and operational phases and any new management practices that may be developed in the future.

1.2 Property Description

The Applicant, Dexter Estates (Pty) Ltd., proposes to develop a regional stormwater pond, on behalf of the City Cape Town, in Fisantekraal. The development site is located adjacent to the existing Durbanville/ Fisantekraal Industrial area. Refer to the locality map attached as **Figure 1** to this report. The property details are as follows:

-  Unregistered Erf 2001², ±1 520 m² (SG Code: C01600770000200100000), in extent.
-  Erf 1991³, ±319 815 m² (SG Code: C01600770000199100000), in extent
-  Road Reserve of Darwin Road

¹The term 'Applicant' and 'Holder of the Environmental Authorisation' are interchangeable.

² Previously Portion 32 of Farm 168

³ Previously Portion 33 of Farm 168

1.3 Project Description / Components (Scope)

The current scope of the proposed development includes the following components:

-  Construction/ expansion of inlet channels within the road reserve of Darwin Road.
-  Construction of a new 'wet' stormwater pond within the services servitude registered on Portion 32 and 33 of Farm 168, and associated landscaping in accordance with the recommendations of the aquatic specialist.
-  The erection of concrete palisade fencing along the boundary line of the services servitude. Re-routing of a $\pm 50\text{m}$ stretch of gravel farm road within the road reserve of Darwin Road.
-  Demarcation of temporary laydown and stockpile areas during construction.
-  Maintenance of the permanent regional pond during the operational phase, including sediment and litter removal and alien vegetation control.

Refer to the stormwater pond design drawing is attached as **Figure 2** to this document.

2 PURPOSE OF THE EMPr

2.1 Scope of the EMPr

The aim of the EMPr is to ensure that proper controls are in place to address the potential environmental and social impacts of the proposed pre-construction, construction, and operation phases of the development. The key activities to be undertaken in each phase are elaborated on below.

The **pre-construction (or planning/ design)** phase of the proposed development will include, amongst other activities, the following:

- Undertaking the various application processes for the required authorisations (permits) from the relevant competent authorities to implement the proposed development.
- Appointment of a suitably experienced project team, including a Project Manager, Consulting Engineer, Landscaper, Environmental Control Officer (ECO) and an Occupational Health and Safety (H&S) Officer.
- Notification of property owners regarding the construction programme.

The **construction** of the proposed development will include the following primary activities:

- The establishment of a construction yard/ office (including laydown and spoil areas) in non-environmentally sensitive area(s), to be ratified on-site by the ECO.
- Site clearance, including the removal of vegetation and disposal of building rubble/ spoil to landfill.
- Conservation (removal and storage) of topsoil for re-use in landscaping on the site (e.g., for the embankments of the pond).
- Development of the stormwater pond and associated infrastructure in accordance with the approved detailed design, including the provision of a temporary gravel access road and the erection of the fence around the pond.
- The appointed landscaper is to establish and monitor the implementation of the required landscaping (including a maintenance establishment period). The landscaper should also advise on any additional maintenance requirements for the aquatic bench vegetation.
- Training for members of the project team, contractors, and subcontractors in accordance with the provisions of the EMPr and the implementation of all safety measures in accordance with the Occupational Health and Safety Act.
- The appointed ECO is to undertake site inspections at the frequency stipulated in the EMPr.

The **operational** phase of the proposed development will include the following primary activities:

- Handover of the completed regional stormwater pond to the City of Cape Town.
- Ongoing operation and maintenance of the permanent regional pond during the operational phase, including sediment and litter removal from the pond, maintenance of landscaping and alien vegetation control.

2.2 Legal Requirements

The provisions of the EMPr are binding on the Applicant and all Contractors during the life of the project and the lives of all contracts. If any conflict occurs between the terms of the EMPr and the project specifications, or pending Environmental Authorisation, the terms in the EMPr shall be subordinate.

The EMPr is a dynamic document subject to similar influences and changes as are wrought by variations to the provisions of the project specification. Any substantial changes must be submitted to the relevant authorities in writing for approval, in accordance with the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment (EIA) Regulations (2014), as amended.

The construction and operational phase aspects of this development must be undertaken according to best industry practice, as identified in the EMPr and any relevant project documentation. This EMPr, which forms an integral (and compulsory) part of all Contract Documents, informs the Contractors/ Responsible Persons as to his/ her/ their duties in the fulfilment of the project objectives, with reference to the prevention and mitigation of potential negative environmental impacts caused by the activities associated with the project.

All Contractors must note that obligations imposed by the EMPr are legally binding in terms of environmental statutory legislation. If any rights and obligations contained in this document contradict those specified in the standards or project specifications, then the latter will prevail.

2.2.1 Statutory and other applicable legislation

It is expected that the Contractor(s) is conversant with all environmental legislation pertaining to the project. In addition, the Contractor must also take cognisance of Provincial and Local Government Ordinances and by-laws, which may be applicable to the project.

2.3 Impact Management Outcomes and Impact Management Actions

Impact management outcomes, and proposed impact management actions to achieve these outcomes, have been determined for the project based on the impact assessment undertaken and recommendations made by Legacy EMC and specialist practitioners. The impact management actions include measures to avoid, manage and/or mitigate the identified impacts.

2.4 Fundamental Principles of the EMPr

The EMPr is based on fundamental principles⁴ derived from applicable government policy statements contained in various government documents and legislation (e.g., the *National Environmental Management Act, (Act 107 of 1998)*). The following principles contained in these documents and laws will be used in the EMPr to guide the various phases of the proposed development, namely:

- Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural, and social interests equitably.
- Development must be socially, environmentally, and economically sustainable, i.e., meet the “triple bottom line” criteria for development.
- Sustainable development requires the consideration of all relevant factors including the following:
 - that the disturbance of ecosystems and loss of biological diversity are avoided, are minimised and remedied;
 - that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;
 - that the development, use and exploitation of renewable resources and the ecosystems of which they are a part do not exceed the level beyond which their integrity is jeopardised;
 - that a risk-averse and cautious approach is applied (also called the Precautionary Approach), which takes into account the limits of current knowledge about the consequences of decisions and actions;

⁴ **Principles** are shared assumptions and truths that policy and action can be based upon.

- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.
- Community wellbeing and Empowerment (e.g., of the construction personnel) must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.
- Capacity building and education: The EMPr must play a dynamic role in developing the understanding, skills, and capacity of the Employees (e.g., construction personnel) in order to promote sustainable development.
- Consider all alternatives: Considering all alternatives results in making the best decisions. The BAR and EMPr must therefore ensure that all alternatives are considered in all decision-making. Developmental and environmental planning, problem solving, and decision-making are often complex. Possible consequences of conflicting interest as well as the consequences of not acting need careful consideration.
- Co-ordination: Various concerns and issues cut across the key sectors and functions in the area. Sustainability and integrated planning and management (including monitoring) therefore will depend on co-ordination and integration of the relevant role players in the construction and operational phases of the proposed development.
- Due process: Due process must be applied in all integrated management activities. This includes adherence to the provisions in the Constitution and statutes dealing with just administration and public participation in regional and local governance.
- Duty of care: Every person (e.g., the Applicant and the contract workers) associated with the development and its associated infrastructure has a duty to act with due care to avoid damage to the environment, or pollution of the environment or waste a precious resource. Also called the Environmental Responsibility Principle.
- Equity: The EMPr is to ensure equitable access to natural resources, benefits, and services to meet basic needs and ensure human wellbeing. Each generation has a duty to avoid impairing the ability of future generations to ensure its wellbeing.
- Full cost accounting: Decisions must be based on an assessment of the full social and environmental costs.
- Good governance: Good governance depends on mutual trust and reciprocal relations between the various groups and sectors of the area and the controlling officials. This must be based on the fulfilment of constitutional, legislative, and executive obligations, and the maintenance of transparency and accountability.
- Prevention: The EMPr must be flexible enough to be adapted to take into account any potential problems that may arise in the future and thereby prevent any negative impacts on the environment, and on people's rights.
- Polluter Pays: Those responsible for environmental damage must pay the repair costs both to the environment and human health and must carry the costs of preventative measures to reduce or prevent further pollution or degradation.
- Subsidiary: Regulatory responsibilities belong at the most local level at which the tasks can be carried out effectively. Environmental management structures must match the ecological scale of the managed resource.
- Waste management: Waste management must minimise and avoid the creation of waste at source. The EMPr is to encourage waste recycling, separation at source and safe disposal of unavoidable waste.

2.5 Structure of the EMPr

Appendix 4 of the NEMA EIA Regulations, 2014 as amended, specifies the information that is to be included in an EMPr. These information requirements are summarised below in Table 1 and are cross-referenced with the contents of this report, where relevant.

Table 1: Content of EMPr as required by the 2014 EIA Regulations, as amended

Regulation	Description	Reference in the Report
(1)	An EMPr must comply with section 24N of the Act and include:	
(a)	(a) details of; (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae	Section 12 and Appendix A
(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description	Section 1.3 and Section 2.1
(c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers	Figures 1 - 2
(d)	a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including; (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and in the case of a closure activity, closure and (v) where relevant, operation activities	Section 4.1, Section 5.1, and Section 6.1
(f)	a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to; (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; and (iii) comply with any applicable provisions of the Act regarding closure, in the case of a closure activity;	Section 4.2, Section 5.2, and Section 6.2
(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 3.2.7
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 3.2.7
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions	Section 3.2
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented	In most cases ongoing during the particular phase of development, except where otherwise specified in the EMPr.
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 3.2.7 and Section 9
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	Section 3.2.7 and Section 9.1
(m)	an environmental awareness plan describing the manner in which; (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks	Section 11

Regulation	Description	Reference in the Report
	must be dealt with in order to avoid pollution or the degradation of the environment; and	
(n)	any specific information that may be required by the competent authority	Sections 4 – 6 (incorporated, as relevant)
(2)	Where a government notice gazetted by the Minister provides for a generic EMPr, such generic EMPr as indicated in such a notice will apply	N/A

3 GENERAL SITE MANAGEMENT

3.1 Project and Environmental Management Team

The Project Management Team will consist of the Applicant (Developer), Project/ Site Manager (Resident Engineer/ Site Agent), Environmental Control Officer (ECO), Health and Safety Officer, Contractors and associated sub-contractors (including a landscape sub-contractor).

The specific names and contact details of the persons responsible within these positions and the sub-contractors involved are tabulated below.

The daily on-site activities will be controlled by the Project/ Site Manager.

Table 2: Site Management Contact Details

Designation	Name	Contact Details
Applicant / Developer / Holder of EA	Dexter Estates (Pty) Ltd.	TBC
Project / Construction Site Manager / Principal Agent	Ekcon Engineers & Project Managers	
Environmental Control Officer (ECO)	To be appointed	
Occupational Health and Safety Officer	To be appointed	
Landscape	To be appointed	
Contractor(s)	To be appointed	

3.2 Communication, Responsibilities and Complaints Management

3.2.1 General Public

It is the responsibility of the **Applicant** to facilitate interaction with the public. This responsibility includes:

-  Informing the landowners of the intent to commence with the activities and in doing so provide background information as to the duration of the project, the working hours, and necessary contact details;
-  Responding to all public complaints or queries whether such complaints are received by the Project/Site Manager, ECO and/or the appointed Contractors;
-  Develop and maintain a register of all public complaints/ queries, as well as the Applicant's response to these complaints and queries; and
-  Respond to the media and prepare media reports should such requests be received.

3.2.2 Duty of Care

The Applicant, Project Manager and Contractors have a Duty of Care towards the environment in terms of Section 28 of NEMA. Section 28 states that *“Every person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by Law or cannot reasonably be avoided or stopped, to minimise and rectify pollution or degradation of the environment.”*

The EMPr requires all involved with the development to act in the spirit of “Duty of Care” throughout the various phases of the project.

3.2.3 Contractors

It is the responsibility of the Contractor(s) is to:

-  Undertake all work on site in accordance with the requirements of the EMPr and Environmental Authorisation;
-  Prepare the required Method Statements, for approval by the Site Manager and ECO;
-  Undertake all work on site in accordance with the requirements of the applicable legislation, including the Basic Conditions of Employment Act, 1997 (Act No. 75 of 1997), Occupational Health and Safety (OSH) Act, 1993 (Act No. 85 of 1993) (as amended) and Overstrand Occupational Health and Safety Policy (2010).
-  Undertake regular (at least weekly) “tool-box talks” with personnel, the contents of which must include reference to the EMPr (with a focus on any compliance issues raised by the ECO);
-  Liaise directly with the Applicant, Project/ Site Manager regarding any queries concerning the EMPr or complaints received from the public;
-  Liaise directly with the Project/ Site Manager should any environmental problems be identified or actions in breach of the objectives set, take place e.g., littering, oil spill;
-  Carry out instructions issued by the Project/ Site Manager; and

3.2.4 Project Applicant / Holder of the Environmental Authorisation

The Project Applicant’s (Holder of the Environmental Authorisation) responsibilities include the following:

-  Attain all necessary approvals and ensure that they are acted on within their validity period;
-  Appoint a project team capable of implementing the requirements of the EMPr and EA, including an ECO;
-  Submit proof of appointment of an ECO to the City of Cape Town’s Environmental and Heritage Management Branch – Northern District;
-  Fulfil all public relations responsibilities in conjunction with the Municipality;
-  Inform the relevant authorities of any site related problems that may occur during the various phases of the project;
-  Attend site meetings when appropriate;
-  Liaise with the Project/ Site Manager regarding environmental management on site; and
-  Assist the Project/ Site Manager in making decisions and finding solutions to environmental problems that may arise during the operation and closure phases.

NOTE: The Holder of the Environmental Authorisation is ultimately **responsible for ensuring compliance** with the conditions of authorisation by any person acting on its behalf, including but not limited to, an agent, sub-contractor, employee, or any person rendering a service to the holder of the authorisation.

3.2.5 Local Authority

The Local Authority’s responsibilities include the following:

-  Attend site meetings when appropriate;
-  Liaise with the Project/ Site Manager regarding environmental management on site; and

- Assist the Applicant, Project/ Site Manager in making decisions and finding solutions to environmental problems that may arise.

3.2.6 Project (Construction) Site Manager / Principal Agent

The Project/ Site Manager's responsibilities include the following:

- Oversee the day-to-day activities on the site and keep an up-to-date diary of site activities;
- Ensure that the requirements as set out in the EMPr, and the conditions of EA are adhered to throughout the lifecycle of the project;
- Direct the Contractors, whenever necessary, to comply with the conditions of the EMPr and EA and recommend corrective action where there is non-compliance with the EMPr;
- The Project/ Site Manager must attend site meetings where required to be able to report on, and respond to any environmental issues, and be issued with copies of minutes of such meetings;
- The Project/ Site Manager must obtain, examine, and approve Method Statements where applicable;
- Advise the project team on environmental issues within the defined work and surrounding areas;
- Collect and record all waste manifest data sheets;
- Maintain the public complaints register on the site; and
- Review the results of the ECO site visits (Reports) and facilitate any corrective actions that may be necessary.

The Project/ Site Manager has the authority to **stop works** if in his/ her opinion there is a serious threat to, or impact on the natural and/or social environment because of construction activities. This authority is to be limited to emergency situations where consultation with the applicant and/or contractor is not immediately possible. In all such work stoppage situations the Project/ Site Manager is to inform the applicant and contractor of the reasons for the stoppage as soon as possible. The necessary instructions should be issued verbally and followed up with written instruction (e.g., via email).

Upon failure by the contractor to show adequate consideration to the environmental aspects of this contract, the Project/ Site Manager may recommend having the contractor's representative or any employee(s) removed from the site or suspend work until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the responsible contractor.

3.2.7 Environmental Control Officer

The Environmental Control Officer's (ECO) responsibilities (if required by the Environmental Authorisation conditions) include the following:

- The ECO must submit written notification of the commencement of work on site to the competent authority;
- The ECO must monitor and report on the level of compliance by the Applicant, Project Manager and Contractors with the approved EMPr and the conditions stipulated in the Environmental Authorisation for the proposed development at the frequency(ies) as stipulated in Section 3.2.7.2 below;
- The ECO must meet with the Project Manager and Contractor(s) before construction begins to present the environmental education training and to go through the contents of the EMPr and EA;
- The ECO will issue an ECO Report/ Checklist after each site visit (or at a minimum once per month) which provides a summary of project progress in general and the findings of the site visit and the level of compliance with the EMPr and EA. The ECO Report must be circulated to the

DEA&DP and the City of Cape Town's Environmental and Heritage Management Branch – Northern District and Catchment, Stormwater and River Management Branch monthly.

-  The ECO must be contacted to attend to environmental problems, should they arise on site, and shall recommend corrective action where there is partial- or non-compliance with the EMPr and/or EA;
-  The ECO must attend site meetings where required to be able to report on, and respond to, any environmental issues, and be issued with copies of minutes of such meetings;
-  The ECO must obtain, examine, and approve Method Statements where applicable;
-  The ECO must manage and keep an up-to-date diary of site activities and a detailed photo record of all site visits;
-  The ECO must advise the applicant, Project/ Site manager and Contractors on environmental issues within the defined work areas;
-  The ECO shall liaise with the local authority's environmental officer on an as required basis.

The ECO has the authority to **stop works** if in his/ her opinion there is a serious threat to or impact on the environment because of construction activities. This authority is to be limited to emergency situations where consultation with the Project/ Site Manager or Applicant is not immediately available. In all such work stoppage situations the ECO is to inform the Project/ Site Manager and Applicant of the reasons for the stoppage as soon as possible. The necessary instructions should be issued verbally and followed up with written instruction (e.g., via email).

Upon failure by the Contractor or his employee to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the Project/ Site Manager to have the Contractor's representative, or any employee(s) removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the responsible Contractor.

3.2.7.1 Level and Type of Competency of ECO

A suitably experienced environmental practitioner(s), with at least 3 years relevant site supervision experience, will need to act as the ECO.

3.2.7.2 Frequency of ECO Site Visits

The frequency of ECO site visits during the construction phase of civils infrastructure should be as follows:

-  Twice per month during the first month of establishment, site clearance and earthworks.
-  Thereafter once per month for the duration of the civils component, based on the level of compliance with the EMPr and EA.
-  A close-out ECO site visit should be undertaken 6 months after construction is completed.

The monthly site visits should, as far as possible, coincide with the monthly site meetings [with the Project Manager and contractor(s)].

An ECO checklist must be completed once per month and must be forwarded to the Project Manager, Contractor(s) and Applicant (developer) within 5 days of the site visit and meeting. *Any environmental problems noted during a site inspection should, however, be brought to the attention of the Project Manager and Contractor as soon as reasonably possible.*

The ECO should undertake *ad hoc* site inspections should environmental problems arise during the construction phases, or when certain milestones have been reached.

The ECO will carry out a final site inspection at the end of the civils construction phase, to undertake an environmental 'close-out' inspection/ audit, to assess compliance with the EA, EMPr and the construction guidelines, and to ensure that satisfactory rehabilitation of any disturbed areas and access roads around the construction sites have been carried out.

Should any environmental problems arise during the construction phase, the RE and/or contractor must immediately inform the ECO to undertake a site visit to assess and attend to the potential environmental problem(s). All works where problems exist are to be stopped until the ECO has been to site and assessed the situation and rectified the problem(s).

3.2.7.3 Reporting on Compliance

The ECO is required to report on compliance in writing to the Project Manager, Applicant, and relevant authorities monthly during the civils construction phase. The construction of the stormwater pond and associated infrastructure civils infrastructure is anticipated to take place over a period of three (3) months. The landscaping will take approximately one (1) month.

Refer to **Section 3.3** with respect to external auditing requirements.

3.2.8 Communication and Record Keeping Procedures on Site

All records related to the implementation of this EMPr (e.g., site instruction book, Site Manager Diary, method statements, environmental authorisation) must be kept together on site where it is safe and can be retrieved easily. These records should be kept for submission to the relevant authorities, if so requested.

3.2.8.1 Site Instruction Entries

An instruction book/ file should be kept on site by the appointed Contractor for the purposes of recording specific important site instructions that need immediate attention. The site instruction book will also be used for issuing "stop work" orders for the purposes of immediately stopping any activities on site due to the environmental risk or impact that may result.

Site inspections will be conducted by an ECO appointed by Applicant/ Developer. The ECO Checklists will serve as a general record of compliances and non-compliances in accordance with the content of the EMPr and EA that need to be addressed during the construction or operational phases of the development. The Project Manager must give immediate attention to any environmental issues that need to be dealt with.

3.2.8.2 Environmental Incidents and External Complaints Register

A register should be maintained by the Project Manager of all environmental incidents occurring on site. The register should record the following information for each incident: date, time, type of incident, person responsible for the incident, corrective action required, immediate corrective action implemented, and whether the incident was reported to the ECO and/or other parties.

A register should also be maintained of any complaints and/or comments received from external parties (such as from neighbours and members of the surrounding community or staff of the proposed development site). The register should record the following information for each complaint and/or comment received: date, time, details of the person who lodged the complaint/ comment, details of the complaint/ comment, action required, immediate action implemented, whether the complaint/ comment was reported to the ECO and/or other parties.

3.2.8.3 Minutes of the Site Meetings

The Minutes of each monthly site meeting must be forwarded to the ECO, Contractor, and the Applicant within one week of the meeting taking place. The minutes of the meeting must record any environmental issues that have been raised by the ECO, and that need to be addressed or rectified.

3.2.8.4 Photographs

It is recommended that photographs are taken of the site regularly by the Project Manager and during site visits by the ECO as a visual reference. These photographs should be filed with other records related to this EMPr.

3.2.8.5 Method Statements

Method Statements

Written submissions by the Contractor(s) must be prepared prior to any activity occurring on site if requested by the Applicant, Project/ Site Manager or ECO, or for activities not addressed in this EMPr. The submission will include the plant or equipment to be used as well as materials, labour, and methods to be used to undertake the activity.

The method statement must be completed in such detail that the Project/ Site Manager is enabled to assess whether the Contractor's proposal is in accordance with the environmental objectives set. The format for such a method statement should follow the following format and include the following information:

-  **What?** A brief description of the project;
-  **How?** A detailed description of the process of work, methods, and materials; and where material will be stored;
-  **Where?** A description/sketch map of the locality of work (if applicable); and compliance/noncompliance with the specifications;
-  **When?** The sequencing of actions with due commencement and completion date estimates (duration of the activity);
-  **Who?** The names of the person/s or companies who are going to undertake the work; and
-  **Why?** An explanation of the reason why the work needs to be carried out.

Copies of all approved Method Statement must be kept on site as required in **Section 3.2.8** above.

3.3 External Auditing Requirements

Auditing of compliance with the EA and EMPr needs to be undertaken in accordance with Section 34 of the EIA Regulations 2014 (as amended from time to time). Audit Reports need to meet the objectives and content requirements as laid out in Appendix 7 to the EIA Regulations 2014 (GNR326) (as amended from time to time). DEA&DP may include conditions relating to auditing in the EA.

It is recommended that one (1) external audit be undertaken during the construction phase; and one (1) external audit per annum during the operational phase, for the first three years of operation.

3.4 Environmental Awareness

All Contractor teams involved in work on the development are to be briefed on their obligations towards environmental controls and methodologies in terms of this EMPr and conditions of the EA prior to work commencing.

3.5 Financing of Environmental Control

Financing of all control measures is the direct responsibility of the Applicant, or each contractor appointed by the Applicant. It is therefore accepted that the costs incurred for implementing the required environmental controls to ensure compliance with local authority By-laws, Provincial and National legislation, the EA and the objectives or requirements specified in this EMPr would be provided for in the specific tender documents.

All responsibilities not defined in the EMPr, or which fall outside of the tender specifications will be the responsibility of the Applicant.

4 ENVIRONMENTAL MANAGEMENT: PRE-CONSTRUCTION PHASE

4.1 Description of the Impact Management Outcomes for the Pre-Construction Phase

The impact management outcomes for the pre-construction phase include the following:

- 🌍 To ensure that the recommended plans and strategies are prepared and implemented timeously to maximise the benefits of the proposed development and manage the anticipated negative impacts prior to the construction phase commencing.

4.2 Environmental Specifications: Pre-Construction

4.2.1 Prepare Recommended Plans and Strategies

Responsible Entity: The Applicant must take responsibility for ensuring that the required plans and method statements as recommended by the freshwater specialist are timeously prepared and implemented.

The appointed **ECO** is to monitor compliance with the required actions below.

NOTE: The required actions below must be prepared prior to commencement of construction.

Required Actions:

- 🌍 Appointment of a Landscaper to prepare a Landscape Plan, prepare tender documentation and procure quotes. *The landscape plan is to be submitted for approval to the City of Cape Town's Environmental Management Department – Northern District and Catchment, Stormwater and River Management Branch.*
- 🌍 A Method Statement should be drawn up before construction begins, setting out the exact methods for construction that are proposed to be used. The minimum area required to undertake the works should be shown in the method statement. This Method Statement should be subject to the approval of the ECO and should be implemented under the guidance of the ECO.

5 ENVIRONMENTAL MANAGEMENT: CONSTRUCTION PHASE

5.1 Description of the Impact Management Outcomes for the Construction Phase

The impact management outcomes for the construction phase include the following:

- To control all aspects of the construction phase by implementing the necessary impact management actions and recommendations to manage any temporary or permanent negative environmental impacts.
- To ensure the conservation of the natural resource base on the site, and institute measures to prevent the degradation of the natural resource base from taking place, including:
 - To ensure the conservation of the topsoil on the site, and institute measures to prevent soil erosion and pollution (contamination) from taking place.
 - To protect and conserve animal life, including birds and snakes which may occur within the development area.
 - To prevent fires from arising from the construction site.
- To ensure the conservation and sustainable use of scarce water resources by instituting measures to minimise water use during the construction phase of the project.
- To ensure waste minimisation and recycling of all waste at source and ensure that recyclables enter the waste stream by engendering an ethic of waste management amongst construction staff.
- To ensure that no stormwater is discharged to the working areas and further to ensure that the stormwater leaving the footprint of the proposed development area is not contaminated by any substance.
- To prevent any impacts on air quality, such as dust and smoke pollution, that could result during the construction phase of the project.
- To minimise the visual (aesthetic) impact of the development, during the construction phase, on the surrounding environment.
- To ensure the conservation of the archaeological and heritage resources on the site, by checking for such resources in any excavations undertaken.
- To optimise the social benefits of the development, local builders/ contractors/ labourers should enjoy preferential appointments to install infrastructure, where practical.
- To maintain and/or enhance security levels around the development site, during the construction phase of the development.

5.2 Environmental Specifications: Construction

5.2.1 General

5.2.1.1 Establish appropriate partnerships.

Responsible Entity: The **Project Manager** must take responsibility for establishing appropriate partnerships and good relationships with local authorities, the local community (including landowners) and contractors.

The appointed **ECO** is to monitor environmental contractual obligations of contractors on an ongoing basis and must undertake the required environmental inductions and training of contractors.

Required Actions:

- Ensure appropriate communication with all local authorities, local communities, and contractors.
- Contractors to be fully informed by the ECO as to their environmental contractual obligations.
- The ECO to give a presentation to contractor and site staff to familiarise them with the environmental aspects of the contract. The Project Team, Contractor(s) and staff must attend this meeting.

5.2.1.2 Set-up of construction site and site offices

Responsible Entity: The **Project Manager** must take responsibility for the setting up of the construction site and site offices and must ensure that construction activities are undertaken in such a manner as to not adversely affect the environment.

The appointed **ECO** is to ratify the areas designated for the below uses and must monitor compliance with the required actions below.

Required Actions:

- Communicate with contractor(s) to ensure that all the environmental specifications are understood and carried out.
- The contractor must point out and demarcate the following areas: construction site and site offices, laydown, spoil and storage areas and concrete batching plant site (if required).
- Control all construction in terms of the Construction Guidelines (refer to **Appendix 1**).
- Construction material (concrete and raw materials) must be stored in designated areas in a neat and orderly manner.
- The storage area for all spoil (e.g., excavated material) from the site must be indicated by the contractor⁵. Trucks removing spoil must remain on designated access roads.
- If there is visual or olfactory evidence of contamination during earth works, the excavated material should be tested for possible contamination before it is re-used. All solid domestic waste to be kept in appropriate containers with scavenger and weather-proof lids and removed from the site by the contractor on a weekly basis to a licensed waste disposal facility. The burning of solid waste and paper on site will not be allowed. Recyclable waste (e.g., paper, glass, tin, plastic) should be separated at source and recycled if possible.
- Concrete mixing must be restricted to a designated area(s) on site and any cement residues are to be removed from site at the end of the contract period. If required, wastewater catch pits must be constructed in series for the capture of cement residues from cleaning of the cement mixer. Residues are to be removed from site from time to time (or at a frequency to be determined by the ECO).
- All parked mechanical vehicles must have a drip tray present to prevent spillage of oils and fuels. Used oil (from servicing of vehicles) should be recycled or disposed of at a registered hazardous waste disposal facility. Hazardous and flammable substances must be stored and used in compliance with applicable regulations and safety instructions. **Health and Safety Officer to monitor compliance.**
- All excavations deeper than 1.5m must be protected from collapsing by shoring up with boards and demarcated if left open overnight. **Health and Safety Officer to monitor compliance.**
- Disturbed areas where dust can arise should be kept moist by spraying with water from a water bowser or other suitable means as advised by the ECO.

⁵ The excavated material is expected to be suitable as filling material on erven or under buildings or roads. The material can therefore be used as general fill and none of the material is expected to be disposed of at a Solid Waste Disposal Facility.

5.2.1.3 Construction Personnel Training

Responsible Entity: The **Project Manager** and responsible **Contractor(s)** must take responsibility for regular staff training and education regarding the environmental implications of construction activities to prevent / minimise the impacts of construction activities on the environment.

The appointed **ECO** is to monitor compliance with the required actions below for the duration of the contract(s). *ECO must inform construction personnel of environmental rules which apply during construction period. This includes informing personnel of the environmental sensitivities of the receiving environment as well as how they should conduct themselves on site.*

Required Actions:

-  Contractors will be responsible for the conduct of their personnel on site, as it pertains to trespassing, littering, and unacceptable social behaviour.
-  Maintain strict supervision over all construction activities.
-  All construction workers must stay within the demarcated development area and no personnel will be allowed beyond such demarcated areas or to trespass onto neighbouring properties.
-  Perimeter fencing (temporary) should be constructed early on during the project, as a demarcation of the site.
-  The contractor must provide temporary chemical toilet facilities at the stores/ site office area, and work sites, where possible. A minimum of one toilet and one handwash basin shall be provided per 15 persons at each working area or as stipulated by the local authority. In addition, at least one urinal should be provided for every 40 males on site or as stipulated by the local authority. The toilets and urinal(s) must be kept in a clean and sanitary condition and must be regularly serviced (on at least a weekly basis). Toilets must be placed at least 50m from freshwater features.
-  Construction personnel may not be housed on the site. Construction personnel will need to be transported to and from work daily.
-  Contractors must be informed of the efficient energy (electricity) use during construction. When not in use lights, angle grinders, motors etc. must be switched off.
-  Contractors must ensure that no open fires are made on site.

5.2.1.4 Performance Criteria

Responsible Entity: The **Project Manager** must ensure that the construction phase meets the required performance criteria and inform the Client of any time delays or non-performance during the contract period.

The appointed **ECO** is to monitor compliance with the required actions below for the duration of the contract(s).

Required Actions

-  Inform all contractors and their staff of the performance criteria.
-  Monitor construction work and maintain a monitoring programme of construction performance.
-  Ensure that contractors adhere to the guidelines in respect of littering, sanitation, spills of hazardous substances, and general behaviour.
-  Ensure that contractors adhere to the relevant working hours as per the National Building Regulations and/or Municipal By-laws.

5.2.2 Freshwater (Aquatic Features) Management

Responsible Entity: The **Project Manager** and **Contractor(s)** must ensure that the mitigation measures as per the aquatic ecosystem assessment Report (Blue Science, August 2021) are implemented in order to

minimise impacts on freshwater ecosystems. All incidents must be recorded and reported to the ECO on an ongoing basis.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

-  Construction activities should preferably take place during the drier, low rainfall months to reduce the potential for contaminated runoff from the construction activities on the site. Should this not be possible measures should be put in place (such as the construction of a temporary berm) to prevent runoff from the construction activities from discharging directly into the adjacent aquatic features.
-  Monitoring and management of the on-site construction activities should be according to an approved Environmental Management Plan and overseen by the appointed ECO for the project.
-  After the construction phase, the disturbed area surrounding the pond should be rehabilitated by reshaping the surface to resemble the adjacent landscape and planting of suitable indigenous vegetation. Refer to Section 5.2.6.2 with respect to landscaping.
-  A Method Statement should be drawn up before construction begins, setting out the exact measures that are proposed to be used. The minimum area required to undertake the works should be shown in the method statement. This Method Statement should be subject to the approval of the ECO and should be implemented under the guidance of the ECO. Demarcation of the approved working area must be undertaken before construction commences

5.2.3 Fauna Management

Responsible Entity: The **Project Manager** and **Contractor(s)** must ensure that harm to fauna and avifauna is prevented, and disturbance is minimised. All incidents must be recorded and reported to the ECO on an ongoing basis.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

-  Contractors must not harm or disturb any wildlife, especially tortoises, snakes, lizards, birds, and small game.
-  Snakes and tortoises must be physically removed from the construction site without harming them. Snakes may be allowed to escape from the construction site and may not be killed or harmed.
-  Care must be taken when driving on site to not accidentally drive over tortoises or other animals.
-  Consideration should be given to the design of the perimeter security fencing so that it allows the movement of smaller animal species through the area, by allowing for a gap (50mm) between the foundation/ ground level and the fence.
-  Contractors must not use chemicals/ pesticides for the maintenance of land/ vegetation and should rather use mowing, grazing, or trimming to control vegetation growth.

5.2.4 Use of Pesticides and Insecticides

Responsible Entity: The **Project Manager** and **Contractor(s)** must ensure that all chemicals used are ratified by the **ECO**. The use of such chemicals is to be conducted by experienced contractors.

The ECO (in collaboration with the **Resident Engineer**) is to monitor all aspects of herbicide, insecticide, and fertiliser use.

Required Actions

-  Care must be taken when using any pesticides, herbicides, and insecticides to prevent pollution of the environment. No pollution of surface or ground water may occur due to any activity on the

property. The relevant requirements of the National Water Act (Act 36 of 1998) must always be complied with.

- 🌿 The relevant requirements of the Hazardous Substances Act (Act 15 of 1973) must always be complied with. Control over the use, storage, application, and disposal of these substances (and empty containers) is needed.
- 🌿 The relevant requirements of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947) must always be complied with.
- 🌿 Pesticides/herbicides/insecticides should have low environmental toxicity (the active ingredients should have short half-lives). Use pesticides that possess chemical properties that are less conducive to runoff (such as low water solubility and high absorption coefficients).
- 🌿 Organic slow-release fertilisers should be used wherever possible. Alternatively, slow-release, less soluble and mobile chemical fertilisers should be used.
- 🌿 Maintain and clean fertiliser and pesticide application equipment in a designated area, which eliminates the potential for on- or off-site environmental pollution.
- 🌿 Mix and load pesticides and herbicides in a designated area where spills may be effectively contained and which eliminates the potential for on- or off-site environmental pollution,
- 🌿 Read and follow label instructions when applying chemical products.
- 🌿 Dispose of empty containers and waste materials at a registered waste disposal facility.
- 🌿 Current Material Safety Data Sheets must be available for all chemicals used. Such chemicals must be stored in appropriate lockable stores.

5.2.5 Fire Management Plan

Responsible Entity: The **Project Manager** and **Contractor(s)** must take the necessary measures to reduce the risk of fire on the property.

The **Project Manager** must ensure that the required insurance(s) is in place.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- 🌿 Utmost caution must be taken not to make any fires on the site (e.g., burning of removed brushwood or for heating of food), especially during summer.
- 🌿 The contractor(s) must have the appropriate insurance for fires caused by their personnel.
- 🌿 Fire safety equipment (fire beaters and extinguishers) should be kept on site and fire training should be provided to personnel.

5.2.6 Soil Management

5.2.6.1 Prevent Soil Erosion

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to prevent soil erosion by wind and water (and prevent the generation of dust).

The **Contractor(s)** must implement the necessary erosion prevention (soil conservation) measures, in accordance with approved Method Statement(s)⁶.

⁶ Method Statements are to be prepared by the Contractor(s) for approval by the Project Manager and ECO.

The appointed **ECO** is to monitor compliance with the required actions below. The ECO is also to monitor site clearance and check for any erosion that may take place.

Required Actions

- The contractor must take appropriate and active measures to prevent soil erosion resulting from construction works (including access roads), operations and activities to the satisfaction of the ECO. Soil conservation measures, such as the construction of diagonal berms over disturbed areas to disperse stormwater, should be implemented where necessary.
- The contractor will protect areas susceptible to erosion by installing the necessary temporary and permanent drainage works as soon as possible and measures to prevent windblown sand and dust (such as stabilisation by chipped vegetation). Additional measures deemed necessary by the ECO or Project Manager must be taken to prevent wind erosion or surface water runoff from resulting in erosion (such as planting of suitable indigenous grass or plant species or using earth berms).
- Institute rehabilitation measures at areas where soil has been denuded or where erosion has taken place. Eroded areas will need to be backfilled and compacted. Straw may need to be worked into the upper soil horizon to bind the soil and prevent dust and windblown sand.

5.2.6.2 Topsoil Management and Landscaping

Responsible Entity: The **Project Manager** and **Contractor(s)** must ensure that topsoil (where available) is stripped and stored on site for later use in landscaping.

The appointed **ECO** is to monitor compliance with the required actions below.

The appointed **Landscape Architect** is to monitor and report on the implementation of the approved Landscape Plan.

Required Actions

- The application site (construction area) and topsoil storage area(s) must be clearly demarcated.
- Brushwood and topsoil removed from the development area should be stored in suitable designated areas for later use in the landscaping.
- The appointed **Landscape Contractor** is to undertake the spreading of any topsoil removed from site within disturbed areas and landscaping areas, under the supervision of the ECO and/or Project Manager as soon as such areas become available for landscaping.
- The planting list for the aquatic bench, permanent pool and embankments is tabulated below. *No kikuyu grass should be planted.*

Aquatic Bench	Permanent Pool	Embankments
<i>Juncus kraussii</i> <i>Bolboschoenus maritimus</i> <i>Cyperus textilis</i> <i>Cyprus thunbergii</i> <i>Isolepis prolifer</i> <i>Juncus capensis</i> <i>Scirpoides nodusus</i> <i>Wachendorphia thyrsiflora</i> <i>Zantedeschia aethiopica</i>	<i>Aponogeton distachyos</i> <i>Juncus lomatophyllus</i> <i>Potamogeton sp.</i>	<i>Cynodon dactylon</i> <i>Ehrharta calycina</i> <i>Eragrostis capensis</i> <i>Eragrostis curvula</i> <i>Leonotis leonurus</i> <i>Themeda triandra</i> <i>Tribolium uniola</i>

- The appointed Landscape Contractor/ Sub-contractor is to monitor the success of the landscaping for a 12-month maintenance establishment period. Quarterly feedback to be provided to the Site Agent/ Management Entity and ECO/ External Auditor.

5.2.6.3 Prevent Soil Pollution/ Contamination

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to prevent soil pollution/ contamination and remedy incidents. All incidents must be reports to the ECO.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

-  Prevent cement spills or clear such accidental spills as soon as possible as cement powder has a high alkalinity pH rating that can contaminate and affect both soil and water pH dramatically. This will have negative impacts on surrounding vegetation.
-  All refuelling and servicing of vehicles must have a drip tray to prevent accidental spillage of oils and fuels. Refuelling must take place in a dedicated area. Similarly, any concrete mixers, dumpers, compressors, or generators must have drip trays under them.
-  All vehicles, equipment, and fuel tanks (e.g., diesel bowser) must be maintained in a good condition to prevent leakages and potential contamination of soil. Plant maintenance to be undertaken off site as far as possible.
-  All oils, paints, fuels, hydrocarbons, and other potentially hazardous materials must be stored in an impermeable concrete bunded area, designed to be able to accommodate 110% of the volume of the materials stored therein. Alternatively, such potentially hazardous materials may be temporarily stored on drip-trays.
-  A hydrocarbon spill kit must be provided on site and personnel must be trained in its use.
-  The requirements of the Hazardous Substances Act, 1973 (Act No 15 of 1973) must be adhered to where relevant.
-  If there is any accidental release of a hazardous substance during the construction phase, it must be reported to the relevant authorities, including the Directorate: Pollution and Chemicals Management, in terms of Section 30 of the NEMA.

5.2.7 Water Management

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute the necessary measures to minimise the use of water during the construction phase of the project.

The appointed **ECO** is to monitor compliance with the required actions below throughout the construction period.

Required Actions

-  No pollution of surface or ground water may occur due to any activity on the site. The relevant requirements of the National Water Act, 1998 (Act No. 36 of 1998) must always be complied with.
-  Contractors must use water sparingly during the construction phase (e.g., for mixing of concrete and washing of equipment). Should dust become a nuisance, efficient use of non-potable water to wet dusty surfaces should be employed.
-  The necessary ablution facilities must be provided (one chemical toilet per 15 workers).

5.2.8 Stormwater Management Plan

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures for stormwater management to prevent erosion, damage to property and the pollution of surface and/or groundwater.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

-  Access to and from the work site must be controlled to prevent migration of sediments off the work site.
-  Material storage areas should be enclosed or covered to prevent contact with stormwater run-off.

- Temporary sediment control fences should be installed prior to commencement with construction to provide a physical barrier to sediment movement and reducing run off velocities. Filtration bags (e.g., sandbags) may be used as an alternative.
- Storm drain inlets are to be temporarily protected by means of filtration berms or a sandbag barrier, if required.
- Temporary interceptor dikes and swales must be used during rainstorms. Alternatively, stormwater barriers in the form of sandbag check dams could be used.
- Appropriate signage to be erected on site by the developer.
- No pollution of surface or ground water may occur due to any activity on the site. The relevant requirements of the National Water Act, 1998 (Act No. 36 of 1998) must always be complied with.

5.2.9 Waste and Effluent Management

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to minimise the generation of waste and to implement the sorting (at source) or recyclables materials out of the waste stream.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- An integrated waste management approach must be used that is based on waste minimisation and must include reduction, recycling, re-use, and disposal where appropriate. Recycled waste (cement packets, paper, and cardboard) should be separately stored for inclusion into the waste stream.
- Waste bins must be used on site. The bins must have lids and an external closing mechanism to prevent scavenging and/or the contents blowing out. Access to the temporary storage area should be controlled.
- All waste must be deposited in the waste bins for removal. The bins must not be used for any other purpose than waste collection and must be emptied on a regular basis by the contractor at a suitably licensed waste disposal facility. Proof of disposal slips must be kept on site.
- No domestic waste should be stored on site for longer than two (2) weeks.
- No solid waste is to be burnt on site.
- Portable toilets to be placed further than 50m from the closest freshwater feature.
- Vegetation to be removed can be chipped and used for soil stabilisation and/or landscaping (or can be sold as firewood).

5.2.10 Traffic Management Plan

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to minimise the risk of construction related activities on motorists using the roads in the vicinity of the site.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- Road construction signs to be erected along appropriate roads, warning motorists of construction related activities and heavy vehicles.
- Structural damage to roads in the vicinity of the construction site must immediately be repaired by the contractor responsible (in accordance with Provincial/ Municipal Road standards).
- Roads must be kept clear of sediment due to construction activities.
- The re-routing of the gravel road must be undertaken timeously to minimise any traffic disruptions for the affected landowners.

5.2.11 Dust and Air Quality Management Plan

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to minimise dust pollution during the construction phase of the project.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- Bare surfaces should be kept moist by spraying water during windy periods to prevent dust formation, until such time that such surfaces are paved or landscaped. Exposed surfaces must be re-vegetated or stabilised as soon as is practically possible.
- Any stored building material from which dust could be generated, such as stockpiled building sand, should be covered or kept moist during windy periods to prevent dust from being generated.
- The excavation, handling and transport of erodible materials must be avoided under high wind conditions.
- Dust generated from the construction activities must comply with the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) National Dust Control Regulation (GN No. R. 827) of 1 November 2013. These regulations prohibit a person from conducting any activity in such a way as to give rise to dust in such quantities and concentrations that the dust, or dust fall, has a detrimental effect on the environment and nearby receptors.
- Staff may only be allowed to smoke within demarcated areas. Cigarette butts must be disposed of in the lidded waste bins provided.
- No fires will be allowed on site. The burning of solid waste and paper on site will therefore also not be allowed.
- All vehicles and motorised equipment used on site must be maintained in a good condition to prevent and/or minimise excessive diesel fumes from such vehicles and equipment.

5.2.12 Noise Management Plan

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to minimise noise pollution during the construction phase of the project.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- All plant equipment, including vehicles, must be properly maintained to minimise noise generation.
- Any complaints regarding noise must be investigated, sources identified, and mitigation measures implemented. Feedback on resolution of the issue must be provided to the complainant.
- Noise generated from construction activity(ies) must comply with the Western Cape Noise Control Regulations P.N. 200/2013.

5.2.13 Aesthetics (Visual)

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to minimise the visual impacts of the development.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- For security and operational lighting to result in minimal visual impact to the immediate context, the Contractor should use lighting only where necessary, and lighting should be positioned at a lower level i.e., bollard height.

- For the reduction of potential negative impacts during the construction phase, the following management procedures should be implemented:
 - Reduce the construction period through proper planning and management, in addition to productive implementation of resources;
 - Restrict the activities and movement of construction workers and vehicles to the immediate construction site as much as possible;
 - Ensure that rubble, litter, and disused construction materials are managed and removed regularly;
 - Ensure that all infrastructure and the site are maintained in a neat manner;
 - Reduce and control construction dust using approved dust suppression techniques;
 - Rehabilitate all disturbed and construction areas to acceptable visual standards.

5.2.14 Archaeological and Heritage Resources

Responsible Entity: The **Project Manager** and **Contractor(s)** must ensure that all archaeological settings and artefacts are reported and conserved.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- No archaeological mitigation is required prior to construction activities commencing.
- If any unmarked human remains are uncovered or exposed during construction activities, these must immediately be reported to the archaeologist (J Kaplan 082 321 0172), or Heritage Western Cape.

5.2.15 Procurement (Job Opportunities)

Responsible Entity: The **Project Manager** and **Contractor(s)** must adhere to the below-mentioned plans.

The **Applicant** or **Project Manager** is to report on compliance with the below-mentioned plans.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- Contractors are encouraged to make use of local labour whenever possible and/or where the nature of the works allows.

5.2.16 Security

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to minimise security risk during the construction phase.

Contractor(s) are responsible for the behaviour of their personnel on site and is to assume responsibility for stock and game theft.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- The contractor(s) will be responsible for the security around the construction site and the conduct of their personnel for the duration of the construction contract.
- Construct a perimeter fence at the earliest staged of the development.

6 ENVIRONMENTAL MANAGEMENT: OPERATIONAL PHASE

6.1 Description of the Impact Management Outcomes for the Operational Phase

The impact management outcomes for the operational phase include the following:

-  To control all aspects of the operational phase of the development by implementing the necessary impact management actions and recommendations to prevent any temporary or permanent negative environmental impacts from occurring in the future.
-  To maintain the stormwater infrastructure, inclusive of landscaping, on the development site.

The City of Cape Town will be responsible for maintaining the stormwater pond during the operational phase, in accordance with the requirements of the EMPr. The stormwater pond and associated infrastructure will be handed over to the City of Cape Town on completion.

6.2 Environmental Specifications: Operation

6.2.1 Freshwater (Aquatic Features) Management

Responsible Entity: The **Management Entity** must ensure that the mitigation measures as per the aquatic ecosystem assessment Report (Blue Science, August 2021) are implemented to minimise impacts on freshwater ecosystems. All incidents must be recorded and reported to the ECO on an ongoing basis.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

-  Ongoing monitoring and control of invasive alien vegetation must be undertaken within the disturbed areas. Alien vegetation control should be undertaken in accordance with best practice and should be undertaken quarterly.
-  Maintenance works such as the removal of sediment, debris and alien vegetation within and adjacent to the stormwater pond should be undertaken under the guidance of an approved Maintenance Management Plan of the river should one exist for the Local Authority for this river, or according to the EMPr for the project. **Refer to Section 6.2.4 for maintenance requirements.** *Note: The design engineer has confirmed that no maintenance works beyond the footprint of the stormwater pond (i.e., registered servitude) will be required.*

6.2.2 Use of Pesticides and Insecticides

Responsible Entity: The **Management Entity** and must ensure that the landscape contractor/ sub-contractor is aware of the chemicals that may be used.

The **landscape contractor(s)** may only use the ratified list of pesticides and insecticides.

The appointed **ECO** is to monitor compliance with the required actions below on an annual basis.

Required Actions

-  As per Section 5.2.4 above.

6.2.3 Stormwater Management

Responsible Entity: The **Management Entity** must maintain the stormwater infrastructure in accordance with the recommendations of the approved Stormwater Management Plan and/or this EMPr and/or any standard maintenance plans adopted by the City of Cape Town.

Required Actions:

- The stormwater pond and associated infrastructure must be maintained on a regular basis in accordance with the best practice requirements for 'wet' ponds, to ensure optimal functioning. The following maintenance activities are required:
 - Monthly inspections of all components of the stormwater pond and associated infrastructure are required.
 - Any damages and wear and tear identified during the monthly maintenance inspection must be repaired within the timeframe stipulated by the inspector.
 - Sediment must be removed 3-monthly from the Forebay and Stilling Basin.
 - Litter must be removed 1-monthly from the Forebay.
 - The non-return flap gate should be inspected monthly to ensure that it opens without obstruction. Debris removal must be undertaken as/if required.
 - The site should be inspected after every major storm, and any debris removed to landfill.
- Records of inspections and repairs are to be kept on file and the frequency of activities adjusted based on the experience at the facility.
- Ongoing monitoring and removal of invasive vegetation from the permanent pool, aquatic shelf and embankments is required. Periodic removal and replacement of vegetation should be undertaken, as required. *The landscaper should advise on any additional maintenance requirements for the aquatic bench vegetation.*
- All debris, sediment, litter and green waste must be disposed of to landfill; and may not be dumped on vacant land in the vicinity of the pond.
- The whole control structure shall be kept structurally sound, free from erosion and functioning as designed. The potential failure of the embankment (e.g., if cracks are observed) should be addressed without delay.
- The integrity of the fencing around the pond should be repaired without delay, for safety reasons. The required signage (e.g., no entry, no swimming) must be maintained on site.
- Continue with the stormwater measures as per Section 5.2.8 above, as applicable.
- The local authority's stormwater standards/ By-law should always be complied with.

It is imperative that the forebay and stilling basin are cleaned regularly, as indicated above, to reduce, or where possible, prevent any potential pollution entering the stormwater pond or being discharged into the Mosselbank River. Cognisance should be taken of Section 28 of NEMA, which emphasises a general "Duty of Care" principle, including a duty to prevent pollution and environmental degradation.

6.2.4 Aesthetics (Visual)

Responsible Entity: The **Applicant** is to monitor the recovery of vegetation in areas which were cleared for construction (and covered with topsoil) on an ongoing basis.

Required Actions:

-  The Applicant is to maintain the infrastructure in good condition in perpetuity and in such a manner that the infrastructure does not become an eye sore.

6.2.5 Security

Responsible Entity: The **Applicant** must monitor and ensure appropriate security measures are applied.

Contractor(s) appointed must be made aware of their obligations (if any).

The appointed **ECO** is to monitor compliance with the required actions below on an annual basis.

Required Actions:

-  Perimeter fencing must be maintained in good condition, and gates locked to prevent access to the stormwater pond.
-  Appropriate no-entry signage must be maintained at the channels and ponds in English, Afrikaans, and Xhosa.

7 ARCHAEOLOGY AND CULTURAL FINDS

Should archaeological objects of any nature (including fossils, graves, or remains of structures) be found, the Contractor will stop all works on site, and notify the appointed ECO and Legacy EMC (Pty) Ltd. immediately. Heritage Western Cape (HWC) and/or South African Heritage Resources Agency (SAHRA) must be consulted for further investigation and clarification.

In addition, the following mitigation measures will be implemented:

-  When archaeological and heritage resources are discovered during excavation and earthmoving activities, HWC must be contacted immediately, and the related activities must be stopped.
-  All finds of human remains must be reported to the nearest police station. Furthermore, the SAHRA or HWC must be contacted if any human remains are found during the construction phase of the project.
-  Human remains or any burial ground or part thereof that are deemed to be of cultural significance may not be destroyed, damaged, altered, exhumed, or removed from their original positions without a permit from HWC;
-  Work in areas where artefacts are found must cease immediately;
-  Under no circumstances must the Contractor, his/ her employees, his/ her subcontractors, or his/ her sub-contractors' employees remove, destroy or interfere with archaeological artefacts. Any person who causes intentional damage to archaeological or historical sites and/or artefacts could be penalised or legally prosecuted in terms of the National Heritage Resources Act, 25 of 1999;
-  A temporary fence/ demarcation at least 2m outside the extremities of the site, must be erected to protect archaeological sites;
-  All known and identified archaeological and historical sites must be left untouched;
-  Work in the area can only be resumed once the site has been completely investigated. The Project Manager will inform the Contractor when work may resume.

8 FOSSIL FINDS PROCEDURE

Should fossil bones and teeth be encountered in the deposits, work must cease at the site and the Site Manager and the ECO for the project must be informed immediately. Scattered, unearthed parts/fragments and enclosing chunks of the find must be retrieved and returned to the main find site which must be protected from further disturbance.

Heritage Western Cape (HWC) and/or an appropriate specialist palaeontologist must be informed and supplied with contextual information as below:

-  A description of the nature of the find.
-  Detailed images of the finds (with scale included).
-  Position of the find (GPS) and depth.
-  Digital images of the context. i.e., the excavation (with scales).

Refer to the HWC Procedure for Chance Finds of Palaeontological Material (June 2016), attached as **Appendix C**.

HWC and an appropriate specialist palaeontologist will assess the information and liaise with the ECO, the environmental consultants and the developer and a suitable response will be established.

In the event of a significant fossil find, a professional palaeontologist must be appointed to undertake the excavation of the fossils and to record their contexts. Said palaeontologist must also undertake the recording of the stratigraphy and sedimentary geometry of the exposures and must undertake the compilation of the detailed report.

A permit from HWC is required to excavate fossils. The applicant for the permit should be the qualified specialist responsible for assessment, collection, and reporting (palaeontologist). Should fossils be found that require rapid collecting, application for a palaeontological permit will immediately need to be made to HWC. The application requires details of the registered owner of the site, their permission, and a site-plan map. All fossil finds must be recorded, and the fossils and their contextual information (a report) must be deposited at an HWC-approved institution.

9 MONITORING AND MANAGEMENT MEASURES

In keeping with current environmental and associated legislation, all environmental management procedures and actions should be reviewed and refined on an on-going basis. This is in accordance with the dynamic nature of environmental management and allows for the timeous identification and mitigation of issues as they come to light. The process of review and refinement, built into the requirements of the EMPr, is known as Monitoring and Auditing.

9.1 Monitoring Procedures

Environmental Monitoring is the continuous evaluation of the status and condition of environmental elements. Its purpose is to detect change that takes place in the environment over time and involves the measuring and recording of physical, social, and economic variables associated with development impacts.

To these ends, the ECO will monitor the site for compliance (i.e., Compliance Monitoring) with the EMPr and EA. Many techniques for Environmental Monitoring have been proposed, each detailing a specific protocol. Regardless of which technique is used, the aim is that each environmental management specification (and associated impact management actions) be checked by means of a system in which a score may be allocated for:

-  Full compliance,
-  Satisfactory performance,
-  Unsatisfactory performance and
-  No action.

Monitoring will take place regularly (to coincide with safety inspections, where relevant). Completed ECO Monitoring Reports will be submitted to the Project Manager and Contractor(s), who will attend to issues/rectify non-compliances and report back to the ECO. These ECO reports must be kept on record and be made available upon request by the Applicant and the Competent Authority.

The EMPr and EA conditions of authorisation apply as follows:

-  All persons employed by the Applicant, Contractor(s) and/or Management Entity must abide by the requirements of these EMPr and EA as they apply to the site.
-  Any employees of the Applicant, Contractor(s) and/or Management Entity found to be in breach of any of the Environmental Specifications may be ordered to leave the site forthwith. The order may be given orally or in writing by the Project Manager or ECO. Confirmation of an oral order will be given as soon as practicable but lack of confirmation in writing shall not be a cause for the offender to remain on site.
-  Supervisory staff of the Applicant, Contractor(s) and/or Management Entity may not direct any person to undertake any activities which would place such person in contravention of the environmental management specifications.

The Applicant, Contractor(s), Project Manager, and/or Management Entity are deemed not to have complied with the Performance Specifications if:

-  There is evidence of wilful or accidental contravention of any specification included in the EMPr and EA.
-  There is evidence of the Applicant, Contractor(s), Project Manager and/or Management Entity carrying out activities not permitted in terms of the Specification.
-  There is evidence of environmental negligence and/or mismanagement resulting in negative impacts on the environment.

The Applicant, Project Manager, Contractor(s) and/or Management Entity will be informed via ECO Reports as well as by means of direct instruction as to what corrective actions are required in terms of Environmental Compliance:

-  Disregard for instruction, and failure to respond adequately to complaints from the public will be construed as non-compliance.
-  Non-compliance may lead to the Contractor(s) and/or Management Entity Employee(s) being blacklisted, or, in more serious cases, the Contractor(s) and/or Management Entity Employee(s) may be evicted from site. Only the Project Manager may issue such instruction, claiming any costs required to remedy situations perpetuated by environmental negligence, mismanagement and / or non-compliance.

9.2 Document Control

The EMPr is a basic planning framework, guiding the various phases of the project. It is important for the EMPr to be revised (improved), if need be, by documenting all actions and management results in a structured format, and especially in accordance with the results of any external audits. It will be important for the EMPr and its supporting documents to be accessible to all the implementing and management members responsible for implementing its actions.

The content and results of the ECO checklist to be submitted after each site meeting can be used for compiling audits and making the necessary changes to the EMPr.

9.3 Management Review

The EMPr should be a **dynamic document**, which depends on continual revision to maintain its relevance. It is therefore imperative for the EMPr to be updated and revised in accordance with information and data that emerges from the monitoring processes (such as ECO checklists), and any new management techniques and technology that may become available in the future.

To maintain continual revision, appropriateness, and effectiveness of the EMPr, and thereby enhance its performance, the ECO/ Auditor (as appropriate) should review and evaluate the EMPr at defined intervals. The reviews should include the following:

-  review the results of the monitoring undertaken during ECO site inspections and audits;
-  review the extent to which the impact management outcomes originally set in the EMPr have been met;
-  review the applicability of the EMPr in relation to changing conditions, circumstances, and information; and
-  obtain and review any concerns amongst relevant I&APs, property owners and relevant authorities that may arise during the construction phase and operational phase in the future.

10 TOLERANCE

10.1 Fines

Fines will be issued for the transgressions listed below. Fines may be issued per incident at the discretion of the Project Manager. Such fines will be issued in addition to any remedial costs incurred because of non-compliance with this document (where applicable). The Project Manager will inform the responsible Contractor of the contravention and the amount of the fine and will deduct the amount from monies due under the Contract.

Fines for the activities detailed below, will be imposed by the Project Manager on the responsible Contractor and/or his Subcontractors.

A	Any person, vehicles, plant, or thing related to the Contractors operations within the designated boundaries of a “no-go” area	R 4 000
B	Any vehicle driving more than designated speed limits	R 1 000
C	Any vehicle being driven, and items of plant or material being parked or stored outside the demarcated boundaries of the site	R 2 000
D	Any person walking outside the demarcated boundaries of the site	R 500
E	Persistent and un-repaired oil leaks from machinery and/or the use of inappropriate methods of refueling.	R 1 000
F	Litter of site	R 500
G	Deliberate lighting of illegal fires on site	R 5 000
H	The eating of meals on site outside the defined eating areas. Individuals not making use of the site ablution facilities.	R 500
I	Dust or excess noise on or emanating from the site.	R 1 000
J	Any person, vehicle, item of plant, or anything related to the Contractors operation causing a public nuisance.	R 2 000

For each subsequent similar offence, the fine may, at the discretion of the Project Manager, be doubled in value to a maximum value of R50 000.00. All fine values are excluding VAT.

All fines and penalties must be made out to an environmental organisation to be determined in consultation with the developer, ECO, and the City of Cape Town’s Environmental Management Department.

10.2 Penalties

The following penalties are suggested for transgressions:

A	Erosion	A penalty equivalent in value to the cost of rehabilitation plus 20%
B	Oil spills	A penalty equivalent in value to the cost of cleanup operations plus 20%
C	Damage to indigenous vegetation, including the landscaped areas	A penalty equivalent in value to the cost of restoration plus 20%
D	Damage to sensitive environments e.g., freshwater ecosystems	A penalty equivalent in value to the cost of restoration plus 20%
E	Damage to cultural sites	A penalty to a maximum of R100 000 shall be paid for any damage to any cultural/historical sites

11 ENVIRONMENTAL AWARENESS AND TRAINING

Site training must be provided for all Contractors and Workers/ Personnel/ Employees in accordance with the provisions of this document.

Ensure that the relevant Environmental Awareness training is presented before the commencement of activities. Ensure that a Health and Safety Officer (compulsory) is appointed before the commencement of activities.

The Contractor must arrange that all his/her employees receive a degree of environmental training during orientation. Such training should be compulsory for all employees, structured in accordance with their relevant rank, level and responsibility, in order that these employees:

- acquire a basic understanding of the environment and the environmental features pertaining to the site and its environs;
- are familiar with the requirements of the EMPr and EA as they apply to the site.

11.1 Environmental Awareness Plan

The following training programmes will be presented:

- Occupational Health and Safety (OHS) – Done internally by Health Officer;
- Personal Protection Equipment (PPE) – Done internally by Safety Officer; and
- Environmental training - Done internally by ECO.

The training is done either annually or bi-annually depending on the need identified by management of the development, as well as training for any new personnel. The environmental training and awareness will be implemented as close as possible to the commencement of the works on site and the training materials will be provided to the Contractor/ Project Manager for environmental induction of new staff.

The Environmental Awareness Plan will serve as the basis for the induction of all new employees (as well as contractors pending the nature of their work on site) on matters as described herein. The Plan will also be used to hone awareness for all employees on a continuous basis.

Specific environmental awareness performance criteria will also form part of the job descriptions of employees, to ensure diligence and full responsibility at all levels of the organisational work force.

11.1.1 Fostering Environmental Awareness

General environmental awareness will be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. This will ensure that environmental accidents are minimised, and environmental compliance maximised.

Environmental awareness will be fostered in the following manner:

- Induction course for all workers on site, before commencing work on site;
- Refresher courses as and when required;
- Taking part in national and international environmental campaigns like National Arbour Day, and National Wetlands Day;
- Displaying of information posters and other environmental awareness material in the general assembly points.

11.1.2 Training and environmental awareness

The Applicant/ Management Entity accepts that environmental awareness training is critical for the workforce to understand how they can play a role in achieving the objectives specified in the EMPr and ensure that the actions specified in the EMPr are implemented effectively and efficiently. Training needs will be identified based on the available and existing capacity of site and project personnel to undertake the required EMPr management actions and monitoring activities. Environmental awareness training, conducted by the ECO prior to construction, will be in addition to any specific detailed training required to implementing the EMPr. It is vital that all personnel are adequately trained to perform their designated tasks to an acceptable standard.

11.1.3 The environmental awareness training course

All employees should attend the course, regardless of position, status, or level of responsibility. With a background of basic environmental awareness and an understanding of basic environmental issues and sensitivities, personnel may be motivated and empowered to do their share in helping to maintain the integrity of the environment on the site through environmental impact management. The goal of this course is therefore to enable a shared understanding and common vision of the environment, the impact of the development on the environment (and why this is important) and the role of personnel in terms of environmental management and compliance. The induction course will comprise of the following steps:

- The first step will include background discussion of the environment concept: of what it comprises and how we interact with it;
- The second step will be a description of the components and phases of the operation;
- The third step will be a general account of how the operation and its associated activities can affect the environment, giving rise to what we call Environmental Impacts;
- The fourth and most important step will be a discussion of what staff can do to help prevent the negative environmental impacts from degrading our environment. This is known as Environmental Impact Management.
- Lastly the consequences of non-compliance will be explained.

11.1.4 Course content

The following can be seen as draft course content as it will be building on as specific needs as it arises and will be supplemented with the handout of reading material and extracts of the EMPr on which the course will be based.

11.1.4.1 The Environment

The environment consists essentially of the living environment, the non-living environment, and the man-made environment.

The living environment consists of our plant and animal resources. The non-living environment includes the soil, water, and geological resources.

The man-made environment comprises our infrastructure, social, cultural, and archaeological resources.

These aspects of the living and man-made environment depend on one another, and man depends on them all for his survival. Damage to one will be felt by others so an effort must be made to try and protect the environment as well as their interactions with one another as they occur in nature. When undertaking an operation or any other form of development this concept must be kept in mind. Development must be implemented in such a way that we benefit today without compromising the ability of future generations to

benefit as well. Employees should understand this concept of sustainability and sustainable development. The specific environment should also be explained as part of the induction course.

11.1.4.2 Description of the components and phases of the operation

The project description as set out in the BAR should be explained as part of induction together with the main components or activities that can affect the environment, giving rise to what we call Environmental Impacts. The operation consists of several different components including the following:

- Firebreaks;
- Water Abstraction and Supply;
- Stormwater Management;
- Waste Management;
- Landscaping;
- Wastewater treatment;
- Security.

11.1.4.3 Description of Environmental impacts

A general account of how the operation and its associated activities can affect the environment must be explained. This is basically a description of the concept of environmental impacts.

a) What is an Environmental impact?

An environmental impact is the result, either good or bad of man's actions on the natural environment. This results in one or many changes in the environment and may also affect the availability of resources and the environment's capacity to function.

Impacts can occur either because of:

- The use of a resource;
- Or the pollution of a resource.

In addition, impacts can be categorised as the following:

- Foreseen: such as the necessary clearing of the vegetation before works on site begin; or
- Unforeseen: such as the flooding of an area following heavy rains;
- Avoidable: such as the unnecessary spillage of diesel during refuelling;
- Unavoidable: such as the disturbance created during works;
- Simple: such as litter untidying the site; or
- Cumulative: such as the pollution of water upstream, which then makes downstream users sick.

b) Types of Environmental Impacts

Typical environmental impacts anticipated include the following:

- The loss of indigenous plants;
- The loss of animals;
- Dust liberation;

- Soil compaction and erosion;
- Litter and waste;
- Fire;
- Water pollution.

c) Causes of environmental impacts

These environmental impacts are caused primarily by inadequate planning and not adhering to the EMPr Specifications, e.g.:

- The injudicious removal / disturbance of vegetation and habitat;
- The unnecessary loss of soil;
- Uncontrolled vehicular movement and circulation;
- The haphazard storage of vehicles, equipment, and material;
- The uncontrolled servicing, repair and refuelling of vehicles;
- Unclear policy on solid waste management;
- Unclear policy on waste water;
- The uninformed use, storage, and disposal of hazardous material;
- The erosive power of storm water and runoff;
- Unintentional and/or uncontrolled fires.

The specific significant impacts of the operation as described in the BAR must be explained.

11.1.4.4 Description of Environmental Mitigation

The fourth and most important step of an induction course will be a discussion of what staff can do to help prevent the negative environmental impacts from degrading their environment. This is known as Environmental Impact Management and is described in the EMPr. The course discussion should also include general environmental code of conduct practices that is not listed as a significant impact or as a mitigation measure such as:

Impact management: Health & Safety (general)

- Always use the toilet and hand washing facilities provided;
- Only use the water provided on site - do not collect water from or dispose water into a natural water course;
- Make use of the specified protective gear for noisy and dusty conditions;
- Always wear proper protective head and foot gear while on site;
- Know where to find a list of emergency numbers in the event of one;
- Report accidents, injuries and unsafe site conditions to the Project Manager or Safety Officer;
- Adhere to the posted speed limits of construction vehicles whilst driving on the access roads.

Impact management: Storage of vehicles, equipment, and materials (general)

- Store machinery, vehicles, and materials only in demarcated areas, and within drip trays;
- Do not leave machinery and equipment standing around if not in use;
- Only park vehicles in designated areas;

- Do not park heavy vehicles or store equipment under or near trees;
- Do not store machinery, vehicles, or materials in undisturbed or rehabilitating areas.

Impact management: Servicing, repair and refuelling of vehicles (general)

- No machinery and vehicles will be serviced on site;
- Regularly check your vehicle for fuel and oil leaks;
- Inform the foreman/ environmental manager of leaking vehicles and machinery so that it can be scheduled for repairs;
- Immediately clean any accidental fuel and oil spills using a hydrocarbon spill kit – do not hose spills into the natural environment;
- Dispose of contaminated soil as hazardous waste in the correct location on site;
- Explain the negative consequences of oil and diesel pollution.

Impact management: Solid waste management (general)

- Do not litter – make use of refuse bins provided;
- Do not hose spills into the natural environment – inform the foreman / project manager of spills you are unable to clean yourself;
- Do not bury, hide, or burn any waste of any nature;
- Inform the foreman / project manager of any illegal litter or dumping site that you encounter.

Impact management: Waste water management (general)

- Do not use any natural watercourse to wash machinery, vehicles, or equipment;
- Only wash machinery, vehicles, or equipment in designated areas;
- Conserve water and report any leaks and overflow to the foreman / project manager.

Impact management: Management of hazardous material (general)

- Make sure that you know how to handle all hazardous substances;
- Do not access stores for hazardous substances without permission;
- Immediately clean any minor accidental spills and leaks using an appropriate hydrocarbon spill kit;
- Do not hose any leaks or spills into the natural environment;
- Dispose of all hazardous waste in specified storage areas - if in doubt, ask;
- Immediately report any major leaks and spills to the foreman / project manager.

Impact management: Fire management (general)

- Do not make open fires except in permitted areas and at permitted times;
- Do not leave any fires unattended. Extinguish fires before you leave the area;
- All cooking is to be done on gas / electric stoves and only in the areas provided;
- No burning of waste;
- Smoking only allowed in designated areas and cigarette butts must be disposed of in a bin;
- Ensure that you know where firefighting equipment is located.

Impact management: Wildlife Management (general)

- Any wildlife encountered during earthworks and construction must not be harmed;
- Snakes especially must be treated with care and should be left alone to escape from the construction area. If they do not escape by themselves, a competent person should remove them to a safe area;
- Snares may not be set to catch hares and small buck;
- Tortoises, lizards, and other wildlife may not be harmed or collected and must be removed from the construction area or be allowed to escape from the construction area.

Impact management: Soil Erosion(general)

- Prevent erosion from diversion, restriction or increase in stormwater;
- Rainwater should be appropriately channelled to prevent erosion or flooding;
- If erosion or any damage caused by construction vehicles occurs (e.g., on access roads and tracks), appropriate measures will need to be undertaken to prevent erosion, and to rehabilitate any damage caused.

Impact management: Dust Abatement (general)

- Reasonable measures to minimise the generation of dust should be undertaken (e.g., removal of the bare minimum of vegetation);
- Areas where earth is moved should be kept wet with water to reduce dust.

Impact management: Pollution (general)

- Engender an ethic of waste pollution management and how plastic bags and paper waste cause, not only visual pollution, but can lead to animal deaths if ingested by them;
- All solid waste must be stored in wind – proof bins to prevent waste being blown around the site;
- Explain also that burning of waste, especially PVC can cause toxic air pollution that is harmful to man, and unsupervised fires can lead to run-away fires;
- The importance of the use of chemical or other toilets will also be emphasised.

11.1.4.5 Consequences of non-compliance

- Explain the consequences of not complying with the conditions of approval and the content of the EMPr which can include the issuing of fines and/or a stop works order and/or result in dismissal.

12 DETAILS OF THE PERSON / COMPANY WHO PREPARED THE EMPr

Legacy Environmental Management Consulting (Pty) Ltd. was appointed as the Independent Environmental Assessment Practitioner (EAP) and has adequate experience within the required Environmental Impact Assessment (EIA) field to facilitate the required Assessment Process. See **Appendix A** for a full CV. The persons involved in the project include:

Kim Pontac		Project Reviewer
		As the Managing Director of Legacy EMC and Principle Environmental Consultant, Kim has many years' experience in applying the principles of Integrated Environmental Management (IEM) and the Environmental Impact Assessment Regulations to several development projects and initiatives in southern Africa and abroad. She has worked in various sectors which include transport, utilities, social infrastructure and minerals, metals and chemicals, hydrocarbons, and nuclear industries. Kim has co-ordinated and managed numerous environmental processes within the public and private sectors for national and international companies. As Principal Consultant, she has successfully conducted a variety of environmental investigations and evaluations for green and brown field projects. Her core experience includes IEM and guiding projects through tendering, design, and construction, operational and decommissioning phases. Kim also has experience in environmental and social due diligence (in accordance with IFC Standards and Equator Principles), environmental compliance audits and environmental legal reviews, permitting and/ or licencing, facilitation and training, and environmental construction monitoring.
Relevant Years of Experience		12+ years
Qualifications		LLM (Environmental Law), University of Cape Town, 2017; BTech (Environmental Management), Cape Peninsula University of Technology, 2008; National Diploma (Oceanography), Cape Peninsula University of Technology, 2004
Professional Registration / Memberships		SACNASP Professional Natural Scientist (Environmental Science) (No: 117908); Institute of Waste Management of Southern Africa (IWMSA) Member No.: 30118035; International Association for Impact Assessment South Africa (2762) (04/10/2010) Member: Environmental Law Association
Role in Project		Internal Review

Karin Bedingfield		Project Manager & Author of Report
		Karin Bedingfield is an Environmental Practitioner with experience in applying the Environmental Assessment Regulations to various development projects across the Western Cape. She has experience in various sectors which include agriculture, residential, commercial, and industrial developments, linear infrastructure projects and renewable energy. Her core experience includes Project Management of environmental projects, Environmental Impact Assessments, Basic Assessment, Environmental Management Plans, Due Diligence Reporting and Compliance Monitoring and Auditing. Karin also has experience in public consultation and authority liaison as part of EIA and BA processes. Karin started working at Legacy EMC as a Principal Consultant when Withers Environmental Consultants was acquired in March 2019. As of March 2021, Karin is a Director of Legacy EMC.

Karin Bedingfield		Project Manager & Author of Report
Relevant Years of Experience	12+ years	
Qualifications	LLM (Environmental Law) 2017, MPhil (Environmental Management) 2008, BSc (Conservation Ecology) 2005.	
Professional Registration / Memberships	Member: International Association for Impact Assessment South Africa (2690)	
Role in Project	Project Manager, Stakeholder Engagement and Report Compiler.	

Appendix A: EAP CV



Karin Bedingfield

Director and Principle Environmental Practitioner

Overview

Name of Firm	Legacy Environmental Management Consulting (Pty) Ltd.
Contact details	karin@legacyemc.co.za
Name	Karin Bedingfield
Date of Birth	14 January 1984
Tertiary Qualification	Master of Laws (LLM) Environmental Law: University of Cape Town 2014 – 2017 Master of Philosophy (MPhil) Environmental Management, awarded with distinction: University of Cape Town, 2007 - 2008 Bachelor of Science (BSc) Conservation Ecology: University of Stellenbosch, 2002 – 2005 Matric Certificate, awarded with distinction: Rhenish Girls' High School, 1997 – 2001
Professional Membership	Member of the International Association for Impact Assessment South Africa (2690)

Areas of Expertise

Karin Bedingfield is an Environmental Practitioner with a demonstrated history of working in the environmental services industry in South Africa. She has experience in various sectors including residential, commercial and industrial developments, renewable energy, transport and infrastructure.

Her core experience includes Project Management of environmental projects, including the tendering, design, permitting and implementation phases. Karin has extensive experience in undertaking Environmental Impact Assessments, Due Diligence Assessments and Compliance Audits. She is also experienced in licensing processes in respect of the Specific Environmental Management Acts (SEMAs) and associated Public Participation Processes.

Areas of expertise includes (but are not limited to):

- Project Management
- Environmental Impact Assessments
- Stakeholder engagement or Public Participation
- Environmental legislation and regulatory provisions
- Environmental Control Officer
- Environmental Compliance Audits and Assessments
- Environmental Due Diligence Assessments
- Environmental Management Programmes
- Environmental Authorisation Amendments
- NEMA S24G Applications

Summary of Employment

March 2019 to Present	Environmental Practitioner, Legacy Environmental Management Consulting, Stellenbosch
Nov 2012 to Feb 2019	Environmental Practitioner, Withers Environmental Consultants, Stellenbosch
Feb 2012 to Oct 2012	Environmental Scientist, Kantey & Templer, Cape Town
Dec 2009 to Jan 2012	Environmental Practitioner, Environmental Consultant, Resource Management Services, Durbanville
Aug 2008 to Nov 2009	Environmental Scientist, Arcus GIBB, Johannesburg

Courses, Conference and Seminars

Conferences Attended

- IAIAAsa 2017 National Conference
- IWMSA Landfill 2011 Conference: *Waste Management Facilities: The New Order*
- IAIAAsa 2010 National Conference
- IAIAAsa 2007 National Conference
- GEF 2007 Fourth Biennial International Waters Conference - *Reporter*

Seminars, Workshops and Training Courses Attended

- DEA EIA Stakeholder Seminar (31 January 2019)
- IAIA Western Cape: Renewable Energy Event (4 October 2019)
- SANBI Biodiversity Offsets Training (18 – 20 September 2018)
- WCPDF Water Crises: Impact on the Property Development and Construction Industries Event (13 December 2017)
- DEADP Seminar on the Amendments to the 2014 EIA Regulations (28 June 2017)
- Smith Ndlovu Summers: Seminar on the Amendments to the 2014 EIA Regulations and Listing Notices (23 May 2017)
- IAIAAsa Western Cape: Section 21(c) and (i) Water Use Training Event (10 May 2017)
- IAIAAsa Western Cape: Development setback and coastal management lines (13 October 2016)
- IAIAAsa Western Cape: Biodiversity Offsets and the launch of a Biodiversity Information Tool (26 May 2016)
- IAIAAsa Western Cape: Social Sustainability Event (7 April 2016)
- IAIAAsa Western Cape: Public Participation Workshop (28 January 2016)
- DEADP Law Reform Process Seminar (26 June 2015)
- IAIAAsa Western Cape: Raising the Quality of the EIA Process (26 May 2015)
- IAIAAsa Western Cape: Environmental regulatory considerations relating to excavations and construction affecting rivers in rural areas in the Western Cape (18 March 2015)
- IAIAAsa Western Cape: Integrating Climate Change in EIA (10 February 2015)
- DEA Seminar on the EIA Regulations 2014 (17 November 2014)
- IAIAAsa Western Cape: Health Impacts of Fracking (31 July 2014)
- IAIAAsa Western Cape: An Introduction to Air Quality Management (26 June 2014)
- IAIAAsa Western Cape: Best Practice for Impact Assessment (15 May 2014)
- IAIAAsa Western Cape: Shale Gas and Hydraulic Fracturing Event (11 April 2013)
- WESSA Understanding Environmental Law: 1 day course (September 2011)
- Managers Mistakes Seminar: presented by Dr Brian Jude (August 2012)
- Technologies for Solid Waste Management for South Africa (April 2011)



CURRICULUM VITAE



LEGACY

ENVIRONMENTAL
MANAGEMENT
CONSULTING

KARIN BEDINGFIELD

Language Proficiency

	Speak	Read	Write
English	Excellent	Excellent	Excellent
Afrikaans	Good	Good	Good



Kim Pontac

Managing Director & Principle Environmental Consultant

Overview

Name of Firm	Legacy Environmental Management Consulting (Pty) Ltd.
Contact details	kim@legacyemc.co.za
Name	Kim Candice Pontac
Date of Birth	01-10-1982
Tertiary Qualification	LLM (Environmental Law), University of Cape Town, 2017 BTech (Environmental Management), Cape Peninsular University of Technology, 2008 ND (Oceanography), Cape Technikon, 2004
Professional Membership	Member: International Association for Impact Assessment South Africa (2762). Member: Environmental Law Association (2016/092/WC). Member: Institute of Waste Management of Southern Africa (30118035). Pr. Sc. Nat. (Prof. Reg. No. 117908) SACNASP.

Areas of Expertise

Kim Pontac is a Principle Environmental Consultant with experience in applying the principles of Integrated Environmental Management (IEM), and in applying the Environmental Impact Assessment Regulations to various development projects and initiatives in Southern Africa and across the African Region. She has worked in various sectors which include social infrastructure, transport, utilities, hydrocarbons, marine and nuclear industries.

Her core experience includes Environmental and Social Impact Assessments and guiding projects through tendering, design, and construction, operational and decommissioning phases. Kim also has experience in Environmental Compliance Auditing, environmental and social Due Diligence Assessments (in accordance with IFC Standards and Equator Principles), Permitting and/or Licencing in respect with Specific Environmental Management Acts (SEMA), Waste Management, to mention a few. In addition, Kim has valuable knowledge and experience in the field of Marine and Environmental Law.

- Integrated Environmental Management Studies
- Environmental and Social Impact Assessments
- Project Management
- Stakeholder engagement or Public Participation
- Marine and Environmental legislation and regulatory provisions
- Environmental Control Officer
- Environmental/Legal Compliance Audits and Assessments
- Environmental and Social Due Diligence Assessments
- Environmental Management Programmes
- Strategic Assessments
- Cleaner Production and Resource Efficiency Assessments



Summary of Employment

- 15 June 2017 – Current** Director and Principle Environmental Consultant, Legacy Environmental Management Consulting (Pty) Ltd.
- 2015 – 14 June 2017** Senior Environmental Scientist, WorleyParsons RSA (Pty) Ltd (Advisian)
- 2012 – 2015** Environmental Scientist, WorleyParsons RSA (Pty) Ltd.
- 2009 – 2012** Environmental Consultant, Resource Management Service.
- 2007 – 2009** Marine Research Scientist (Sea Point Research Aquarium), Department of Environmental Affairs and Tourism (Marine and Coastal Management).
- 2006 – 2007** Aquarist, SeaWorld Ushaka.
- 2005 – 2006** Auxiliary Service Officer (Line-fish Section, Department of Environmental Affairs and Tourism (Marine and Coastal Management).
- 2004 – 2005** Personnel Practitioner, Western Cape Education Department.

Courses, Conference and Seminars

- 2019** WasteCon.
- 2018** IAIA International Conference: Environmental Justice in Societies in Transition.
- 2017** IAIA SA Annual Conference: Inspiring Integrated Environmental Management.
- 2016** Cleaner Production and Resource Efficiency, NCPC and CSIR.
- 2016** Energy Management System, NCPC and CSIR.
- 2012** WasteCon.
- 2011** Seminar on Technologies for Solid Waste Management for South Africa: Knowledge Base (Pty) Ltd.
- 2010** IAIA SA Annual Conference: Knowledge Base (Pty) Ltd.
- 2010** DEADP Workshops on Amended NEMA EIA Rees 2010: Knowledge Base (Pty) Ltd.

Language Proficiency

	Speak	Read	Write
Afrikaans	Good	Good	Good
Speak	Excellent	Excellent	Excellent

Appendix B: Construction Guidelines

APPENDIX B

GENERIC CONSTRUCTION GUIDELINES

1. INTRODUCTION

Construction is potentially one of the most destructive phases of the development process that can harm the environment permanently if it is not appropriately planned and the necessary mitigation correctly applied and managed.

Construction implies certain inevitable levels of change to the affected environment or 'place'. A certain degree of change to the environment, within acceptable environmental norms, nevertheless has to be accepted. It is, however, important for such inevitable change to be limited within confined boundaries, so as to protect ecological, social, and cultural characteristics (i.e. the 'sense of place') of the affected environment, by pursuing the best practicable environmental option(s) or practices.

A primary environmental objective is, therefore, to limit the unavoidable disturbance or fragmentation of the environment to the *'limits of acceptable change'*.

The Environmental Management Programme (EMPr), together with these Construction Guidelines, is to form part of the construction contractual documentation, i.e. the appointed contractors must be fully aware of the impact management outcomes that need to be achieved and the impact management actions that need to be carried out as part of the construction programme.

The construction programme is to be implemented by the appointed contractors, on behalf of the relevant Developer, in accordance with the EMPr and these Construction Guidelines.

Compliance with the Construction Guidelines will be monitored by the ECO (Environmental Control Officer), to be appointed, who will also monitor compliance with the conditions of approval as contained in the Environmental Authorisation (EA) for the project.

This Construction Guideline document forms part of the Contractor's contractual documentation entered into between the Developer and the Contractor and must be signed by the appointed Contractor as acknowledgement of its content.

2. PRE-CONSTRUCTION PHASE

This phase is to be based on the following principles and guidelines:

- A construction contract must be established between the Developer and the appointed Contractor(s). The contract should include a penalty clause for both environmental and construction transgressions.
- The construction site office, stores, temporary storage of diesel and cement is to be located on an appropriate, non-environmentally sensitive site and must be accessible to large trucks and be large enough for the secure storage of equipment, pipes and fittings, and mechanical machinery and the delivery of raw materials.
- The Contractor should provide the necessary training of staff to fill certain construction jobs on site. The Contractor will also be obliged to employ an Oudtshoorn Municipality first policy when employing staff.

- The ECO must inform all contractors and their personnel in respect of the environmental code of conduct prior to the commencement of any construction work.
- The Contractor must demarcate the boundaries of the construction sites with danger tape or fencing. Construction workers must remain in close proximity to the construction site.
- If required only one refuelling area should be provided at the stores/site office. A bunded area must be provided beneath the storage tank. The bund must be watertight and must be able to contain 110% of the volume of all fuels and chemicals to be housed in it for the duration of the construction period. A concrete apron must be cast on the refuelling area to contain diesel spills and drips. The concrete floor of the bunded area can be lined with a layer of soil approximately 150mm thick to absorb any spills and drips. This soil layer is to be replenished from time to time according to the degree of contamination and the contaminated soil removed to an applicable waste disposal facility that accepts such toxic waste. If a mobile fuel bowser is to be used it must be checked for leaks and efficient operation and must have a drip tray under it when parked. All oils diesel and release oils used in the construction process must be kept within the bunded area. Access to the bunded area must be controlled at all times and must be locked at all times.
- The parking and emergency service area for construction vehicles should be well-compacted earth to prevent oil and diesel spills contaminating the soils of the site. Should oil or diesel spills occur, they should be treated with a suitable hydrocarbon absorption or remediation product. Absorbent spill mop-up products need to be on hand - Products to be investigated should include Sunisorb absorbents (www.sunisorb.com) and the hydrocarbon encapsulator "Oilcap" (www.pineland.co.za). All contaminated soils must be removed from the site and disposed of at an appropriate waste disposal facility.
- A suitable leak proof container for the storage of oiled equipment (filters, drip tray contents and oil changes etc.) must be provided if servicing of vehicles takes place on site. Fuels and oils must be safely located out of harms way from the elements (preferably within the bunded area) and safety and fire prevention must be strictly adhered to. The necessary fire hydrants should be on site.
- Any removed topsoil is to be temporarily stockpiled in suitable designated areas for later use in the rehabilitation of the sites, if needed. It may be necessary for the Contractor to stabilise the exposed sandy areas to prevent erosion and dust by spreading straw or brushwood (removed from the site) over the surface. The access roads may also require wetting to suppress dust.
- The Contractor must provide temporary chemical toilet facilities at the stores/site office area. A minimum of **one toilet shall be provided per 15 persons at each working area** or as stipulated by the local authority. The toilets must be kept in a clean and sanitary condition, and must be regularly serviced. Toilet paper is to be provided by the Contractor.

3. CONSTRUCTION PHASE

This phase is to be undertaken in accordance with the following principles and guidelines:

- The construction area must be clearly demarcated and no construction activity will be allowed outside of this area. All linear alignments of pipelines, cables, powerlines etc. must be appropriately demarcated.
- Construction and delivery vehicles must not be allowed to leave the demarcated areas and must only use the existing access road/s in and out of the construction area.
- Any cultural-historic artefacts unearthed during excavations must be reported to the ECO as soon as possible and all earthworks should be curtailed in those areas until such time as the ECO and/or a consulting archaeologist has surveyed the site(s) and made his/her recommendations. Heritage Western Cape must immediately be informed if the consulting archaeologist deems the finds to be significant.
- All vehicles, equipment, fuel and petroleum services and tanks must be maintained in a good condition that prevents leakage and possible contamination of soil or ground water supplies.
- All emergency servicing of vehicles must be conducted over a drip tray present to prevent accidental spillage of oils and fuels. Used oil should be recycled or disposed of at a hazardous waste disposal facility.
- All fuel/ oil spills must be reported to the ECO.
- Construction material must be stored in areas designated by the Site Agent and in a neat and orderly manner.
- The Contractor must store any building rubble (construction waste) in a suitable area designated by the ECO and should ideally be removed from site on a weekly basis (if not to be used as fill). Should dust become a problem, spraying of a water mist may be required. Stormwater controls may be required for diverting stormwater away from sensitive areas where erosion can take place.
- All other solid waste (e.g. domestic waste) must be kept in appropriate (scavenger and weather-proof) containers and must be removed from the site by the Contractor on a weekly basis to a licensed waste disposal facility. The **burning of solid waste and paper will not be allowed on site**. Recyclable waste should be recycled if at all possible (metal, paper, cardboard, bottles, tins and plastic).
- Concrete mixing and the subsequent cement residues must be restricted to designated areas on the site. Such residues are to be removed from the site within one week of completing each phase of the construction period.
- **Used cement bags are to be stored in a wind and rainproof container for disposal.** Used bags may not lie around on site nor may they be burnt on site.
- Excess or spilled concrete should be confined within the works area and then removed to a waste site.

- Cement powder has a high alkalinity pH rating that can contaminate and affect both soil and water pH dramatically. Cement spills must therefore be prevented or cleared as soon after the spill as possible.
- All excavations (especially within deep unconsolidated sand) deeper than 1.5m must be shored up to prevent collapse of the sides and possible injury to workers or even loss of life.
- All open excavations must be protected with danger tape.
- Scarifying of exposed soil surfaces should be conducted in order to speed up the rehabilitation process of disturbed areas.
- Disturbed areas around the building sites, where dust can arise, may require wetting by spraying with water from a water bowser or other suitable means, or alternatively, straw can be worked into the surface to bind the soil and prevent windblown dust.
- The Contractor will be responsible for security on the site of works and will ensure that his staff do not trespass onto other properties.
- The Contractor must provide dedicated eating areas for staff. Waste bins with lids must be provided at such areas. Such eating areas are to be maintained in a neat condition.
- Open fires (if allowed by the Safety Officer) must be contained in a dedicated area and within a suitable container. Any fires must be supervised at all times. Treated timber, and waste from the construction site must not be burnt on site.
- The ECO and Project Manager must monitor the contractors' compliance with the construction and progress in terms of the above environmental guidelines on a regular basis. The ECO will issue an ECO Checklist within 5 days after each site visit to provide a record of instructions given to the Contractor/Site Agent for environmental work that needs to be done or where problems have been noted.

4. POST-CONSTRUCTION PHASE

This phase is to be undertaken in accordance with the following principles and guidelines:

- All temporary structures must be removed from the site within three weeks after completion of a particular phase of the project.
- The Contractor must remove all oil and cement spills as soon as possible. Alternatively, spills may be picked up and stored in appropriate containers/waste skips prior to removal.
- All building rubble and other forms of waste must be removed from the site, within one week after completing a particular phase.
- The Contractor must repair disturbed areas (e.g. ripping of deep tracks left by construction vehicles) within one week after completing each phase of the project.
- The rehabilitation of disturbed areas can commence as soon as disturbed areas become available and once climatic conditions allow for it.

- Topsoil and and/or brushwood and/or straw are to be evenly spread over disturbed areas to facilitate the rehabilitation.
- The ECO must make sure that all the environmental stipulations put forward in the construction contracts and/or ECO Checklists have been complied with, and must advise the Developer/ if the penalty clause needs to be applied for any environmental impacts that may have occurred.

The Contractor must accept the above Construction Guidelines. **It is expected that the Contractor sign this document as part of the main contract with the Developer.** The main Contractor will also be solely responsible for the conduct of all subcontractors that may be used in this contract.

Signed by: _____ on behalf of: _____

Name: _____

Signed by: _____ on behalf of: _____

Name: _____

Witness: _____

Name: _____

Date: _____

Appendix C: HWC Fossil Finds Procedure

HWC PROCEDURE: CHANCE FINDS OF PALAEOLOGICAL MATERIAL

June 2016

Introduction

This document is aimed to inform workmen and foremen working on a construction and/or mining site. It describes the procedure to follow in instances of accidental discovery of palaeontological material (please see attached poster with descriptions of palaeontological material) during construction/mining activities. This protocol does not apply to resources already identified under an assessment undertaken under s. 38 of the National Heritage Resources Act (no 25 of 1999).

Fossils are rare and irreplaceable. Fossils tell us about the environmental conditions that existed in a specific geographical area millions of years ago. As heritage resources that inform us of the history of a place, fossils are public property that the State is required to manage and conserve on behalf of all the citizens of South Africa. Fossils are therefore protected by the National Heritage Resources Act and are the property of the State. Ideally, a qualified person should be responsible for the recovery of fossils noticed during construction/mining to ensure that all relevant contextual information is recorded.

Heritage Authorities often rely on workmen and foremen to report finds, and thereby contribute to our knowledge of South Africa's past and contribute to its conservation for future generations.

Training

Workmen and foremen need to be trained in the procedure to follow in instances of accidental discovery of fossil material, in a similar way to the Health and Safety protocol. A brief introduction to the process to follow in the event of possible accidental discovery of fossils should be conducted by the designated Environmental Control Officer (ECO) for the project, or the foreman or site agent in the absence of the ECO.

It is recommended that copies of the attached poster and procedure are printed out and displayed at the site office so that workmen may familiarise themselves with them and are thereby prepared in the event that accidental discovery of fossil material takes place.

Actions to be taken

One person in the staff must be identified and appointed as responsible for the implementation of the attached protocol in instances of accidental fossil discovery and must report to the ECO or site agent. If the ECO or site agent is not present on site, then the responsible person on site should follow the protocol correctly in order to not jeopardize the conservation and well-being of the fossil material.

Once a workman notices possible fossil material, he/she should report this to the ECO or site agent.

Procedure to follow if it is likely that the material identified is a fossil:

- i. The ECO or site agent must ensure that all **work ceases** immediately in the vicinity of the area where the fossil or fossils have been found;
- ii. The ECO or site agent must **inform HWC of the find immediately**. This information must include photographs of the findings and GPS co-ordinates;
- iii. The ECO or site agent must compile a **Preliminary Report and fill in the Fossil Discoveries: HWC Preliminary Record Form** within 24 hours without removing the fossil from its original position. The **Preliminary Report** records basic information about the find including:
 - The date
 - A description of the discovery
 - A description of the fossil and its context (e.g. position and depth of find)
 - Where and how the find has been stored
 - Photographs to accompany the preliminary report (the more the better):
 - A scale must be used
 - Photos of location from several angles
 - Photos of vertical section should be provided
 - Digital images of hole showing vertical section (side);
 - Digital images of fossil or fossils.

Upon receipt of this **Preliminary Report**, HWC will inform the ECO or site agent whether or not a rescue excavation or rescue collection by a palaeontologist is necessary.

- v. **Exposed finds must be stabilised where they are unstable and the site capped, e.g. with a plastic sheet or sand bags.** This protection should allow for the later excavation of the finds with due scientific care and diligence. HWC can advise on the most appropriate method for stabilisation.
- vi. If the find cannot be stabilised, **the fossil may be collect with extreme care** by the ECO or the site agent and put aside and protected until HWC advises on further action. Finds collected in this way must be safely and securely stored in tissue paper and an appropriate box. Care must be taken to remove the all fossil material and any breakage of fossil material must be avoided at all costs.

No work may continue in the vicinity of the find until HWC has indicated, in writing, that it is appropriate to proceed.

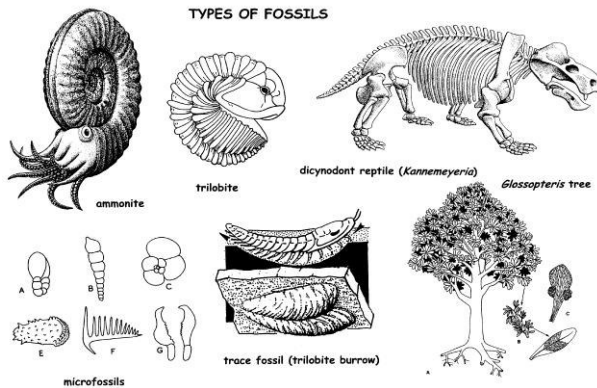
FOSSIL DISCOVERIES: HWC PRELIMINARY RECORDING FORM

Name of project:		
Name of fossil location:		
Date of discovery:		
Description of situation in which the fossil was found:		
Description of context in which the fossil was found:		
Description and condition of fossil identified:		
GPS coordinates:	Lat:	Long:
If no co-ordinates available then please describe the location:		
Time of discovery:		
Depth of find in hole		
Photographs (tick as appropriate and indicate number of the photograph)	Digital image of vertical section (side)	
	Fossil from different angles	
	Wider context of the find	
Temporary storage (where it is located and how it is conserved)		
Person identifying the fossil	Name: Contact:	
Recorder	Name: Contact:	
Photographer	Name: Contact:	

Palaeontology: what is a fossil?

Fossils are the traces of ancient life (animal, plant or microbial) preserved within rocks and come in two forms:

- Body fossils preserve parts, casts or impressions of the original tissues of an organism (e.g. bones, teeth, wood, pollen grains); and
- Trace fossils such as trackways and burrows record ancient animal behaviour.



How to report chance fossil finds: What should I do if I find a fossil during construction/mining?

If you think you have identified a fossil:

Immediately inform the ECO or Site Agent.
He/she will then contact HWC and write a report
and if necessary operations will stop in that
specific area until the fossil is recovered

Heritage Western Cape
ceoheritage@westerncape.gov.za

021 483 5959

www.hwc.org.za

iLifa leMveli iNtshona Kapa
Erfenis Wes-Kaap
Heritage Western Cape

Types of palaeontological finding - What does a fossil look like?

Fossils vary in size, from fossilised tree trunks and dinosaur bones down to very small animals or plants.
Finds can be **individual fossils** (one isolated wood log or bone) or **clusters and beds** (several bones, teeth, animal or plant remains, trace fossils in close proximity or bones resembling part of a skeleton). A bed of fossils is a layer with many fossil remains.

Below there is a list of few examples of fossils which may be identified during excavations in the Western Cape.

Image	Description	Image	Description
	Leaves		Snail shells and other shells
	Fossil wood		Bones of larger animals
	The remains of fish and marine life (e.g. teeth, scales, starfish)		Large burrows made by moles and other animals
	Stromatolites		Traces made by burrowing insects (ants, wasps, dung-beetles etc.).
	Animal footprints		

Images provided by Dr John Almond

Text by HWC's Archaeology, Palaeontology & Meteorites Committee June 2016



Figure 1 Locality Map



Figure 1: Locality Map

The approximate location of the proposed Regional Stormwater Pond and associated channels is shown in green (Source: Google Earth, 28 July 2021]

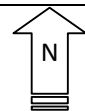


Figure 2 Conceptual Development Plan

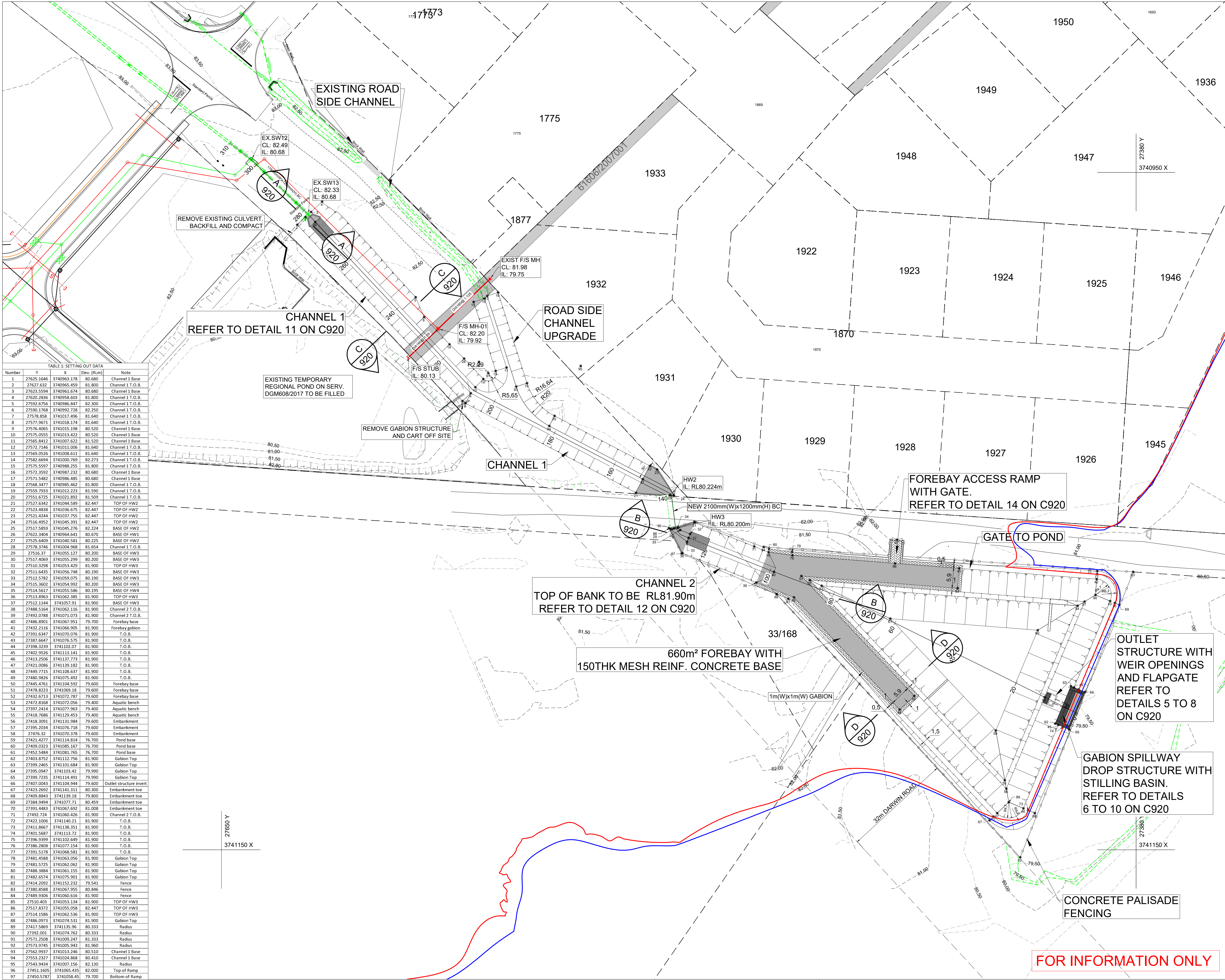


TABLE 1: SETTING OUT DATA				
Number	Y	X	Elev. (RLm)	Note
1	27625.1646	3740963.178	80.680	Channel 1 Base
2	27627.632	3740965.459	81.800	Channel 1 T.O.B.
3	27623.5594	3740961.074	80.680	Channel 1 Base
4	27620.2836	3740958.603	81.800	Channel 1 T.O.B.
5	27592.6756	3740986.847	82.300	Channel 1 T.O.B.
6	27590.1768	3740992.728	82.250	Channel 1 T.O.B.
7	27578.858	3741017.496	81.640	Channel 1 T.O.B.
8	27577.9671	3741018.174	81.640	Channel 1 T.O.B.
9	27576.4065	3741015.198	80.520	Channel 1 Base
10	27575.0555	3741013.422	80.520	Channel 1 Base
11	27565.8412	3741007.622	81.520	Channel 1 Base
12	27572.7146	3741011.006	81.640	Channel 1 T.O.B.
13	27569.0526	3741008.611	81.640	Channel 1 T.O.B.
14	27582.6694	3741000.769	82.273	Channel 1 T.O.B.
15	27575.5597	3740988.255	81.800	Channel 1 T.O.B.
16	27572.3592	3740987.232	80.680	Channel 1 Base
17	27571.5482	3740986.485	80.680	Channel 1 Base
18	27568.3477	3740985.462	81.800	Channel 1 T.O.B.
19	27566.7933	3741012.223	81.590	Channel 1 T.O.B.
20	27551.6725	3741021.892	81.509	Channel 1 T.O.B.
21	27527.6342	3741044.589	82.447	TOP OF HW2
22	27523.4838	3741036.675	82.447	TOP OF HW2
23	27521.4244	3741037.755	82.447	TOP OF HW2
24	27516.4952	3741045.391	82.447	TOP OF HW2
25	27517.5859	3741045.276	82.224	BASE OF HW2
26	27522.3404	3740964.641	80.670	BASE OF HW1
27	27525.6409	3741040.581	80.225	BASE OF HW2
28	27578.3746	3741004.968	81.654	Channel 1 T.O.B.
29	27516.37	3741055.127	80.200	BASE OF HW3
30	27517.4869	3741055.299	80.200	BASE OF HW3
31	27510.3298	3741053.429	81.900	TOP OF HW3
32	27511.6435	3741056.748	80.190	BASE OF HW3
33	27512.5782	3741059.075	80.190	BASE OF HW3
34	27515.3602	3741054.992	80.200	BASE OF HW3
35	27514.5617	3741055.586	80.195	BASE OF HW4
36	27513.8963	3741062.385	81.900	TOP OF HW3
37	27512.1144	3741057.91	81.900	BASE OF HW3
38	27488.5164	3741062.116	81.900	Channel 2 T.O.B.
39	27492.0788	3741071.073	81.900	Channel 2 T.O.B.
40	27486.8901	3741067.951	79.700	Forebay base
41	27432.2116	3741066.905	81.900	Forebay gabion
42	27391.6247	3741070.076	81.900	T.O.B.
43	27387.6647	3741076.575	81.900	T.O.B.
44	27398.3239	3741102.07	81.900	T.O.B.
45	27402.9526	3741113.141	81.900	T.O.B.
46	27413.2066	3741137.773	81.900	T.O.B.
47	27421.0286	3741139.182	81.900	T.O.B.
48	27449.7715	3741108.637	81.900	T.O.B.
49	27480.9826	3741075.492	81.900	T.O.B.
50	27445.4761	3741104.592	79.600	Forebay base
51	27478.8223	3741069.18	79.600	Forebay base
52	27432.0713	3741072.787	79.600	Forebay base
53	27472.8168	3741072.056	79.400	Aquatic bench
54	27397.2414	3741077.963	79.400	Aquatic bench
55	27418.7686	3741129.453	79.400	Aquatic bench
56	27418.3091	3741131.984	79.600	Embankment
57	27395.0334	3741076.718	79.600	Embankment
58	27478.32	3741070.378	79.600	Embankment
59	27421.4277	3741114.814	76.700	Pond base
60	27409.0323	3741085.167	76.700	Pond base
61	27452.5484	3741081.765	76.700	Pond base
62	27403.3752	3741112.756	81.900	Gabion Top
63	27399.2465	3741101.684	81.900	Gabion Top
64	27395.0947	3741103.42	79.990	Gabion Top
65	27399.7235	3741114.491	79.990	Gabion Top
66	27407.0043	3741104.944	79.600	Outlet structure invert
67	27423.2692	3741141.311	80.300	Embankment toe
68	27409.8843	3741139.18	79.800	Embankment toe
69	27384.9494	3741077.71	80.459	Embankment toe
70	27391.4483	3741067.692	81.008	Embankment toe
71	27492.724	3741060.426	81.900	Channel 2 T.O.B.
72	27422.1006	3741140.21	81.900	T.O.B.
73	27411.8667	3741138.351	81.900	T.O.B.
74	27401.5887	3741113.72	81.900	T.O.B.
75	27396.9399	3741102.649	81.900	T.O.B.
76	27386.2808	3741077.154	81.900	T.O.B.
77	27391.5178	3741068.581	81.900	T.O.B.
78	27481.4588	3741063.056	81.900	Gabion Top
79	27481.5725	3741062.062	81.900	Gabion Top
80	27488.3884	3741061.155	81.900	Gabion Top
81	27482.6574	3741075.901	81.900	Gabion Top
82	27414.2092	3741152.232	79.541	Fence
83	27380.8588	3741067.955	80.846	Fence
84	27489.9306	3741060.616	81.900	Fence
85	27510.403	3741053.134	81.900	TOP OF HW3
86	27517.8372	3741055.058	82.447	TOP OF HW3
87	27514.1586	3741062.536	81.900	TOP OF HW3
88	27486.0973	3741074.531	81.900	Gabion Top
89	27417.5869	3741135.96	80.333	Radius
90	27392.001	3741074.762	80.333	Radius
91	27571.2508	3741009.247	81.333	Radius
92	27573.9745	3741005.943	81.960	Radius
93	27562.9937	3741013.246	80.510	Channel 1 Base
94	27553.2327	3741024.868	80.410	Channel 1 Base
95	27543.9434	3741007.156	82.130	Radius
96	27451.1609	3741065.435	82.000	Top of Ramp
97	27450.5787	3741058.45	79.700	Bottom of Ramp

REVISION:

No.	DATE	DESCRIPTION
A	2021-07-15	FOR INFORMATION

LEGEND:

90

CADASTRAL CONTOUR

STORMWATER NETWORK

50YR FLOODLINE

100YR FLOODLINE

PROJECT:

FISANTEKRAAL REGIONAL ATTENUATION POND

DRAWING TITLE

FISANTEKRAAL REGIONAL DAM AND UPSTREAM CHANNELS

CLIENT

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DRAWN BY

DESIGNED BY

A.VENTER

GA McGill Pr Eng
No. 780269

DATE

2021-07-15

SCALE

1:500

DRAWING NO

MC357-C900

REVISION

A

FOR INFORMATION ONLY

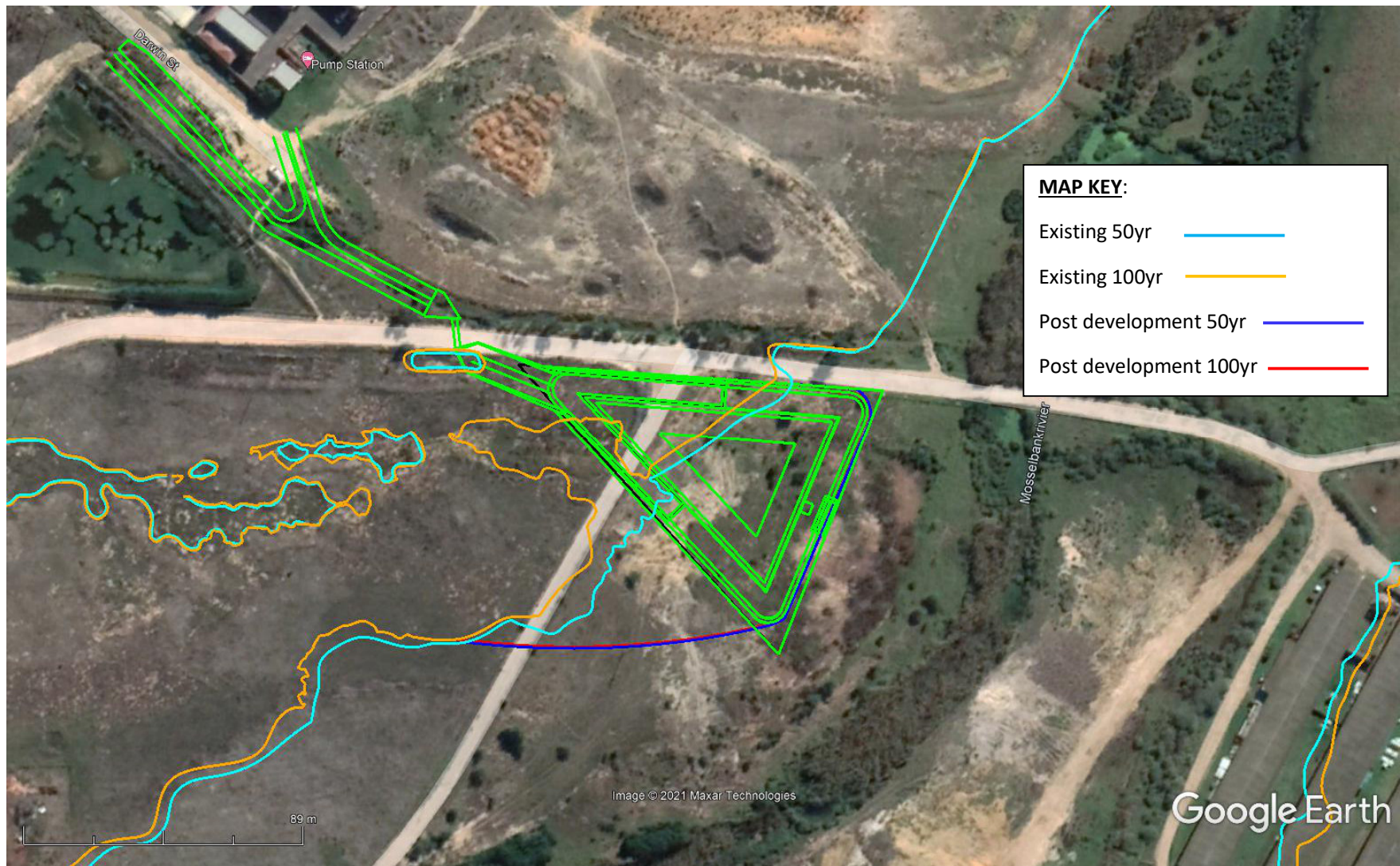


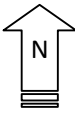
	Figure 2: Floodline Delineation The approximate location of the proposed Regional Stormwater Pond and associated channels is shown in green, and the pre- and post- development 50yr and 100-yr flood lines as per the map key (Source: Google Earth, Accessed: 20 August 2021)	
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Figure 2: Wetland Area Delineation

The approximate location of the proposed Regional Stormwater Pond and associated channels is shown in green. The wetland delineated edge is indicated by the yellow line (Source: Google Earth, Accessed: 20 August 2021 and Blue Science]

