

DRAFT PRE-CONSTRUCTION & CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

for the

THE PROPOSED HUDDLE TOWNSHIP DEVELOPMENT

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TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMS	iv
GLOSSARY OF TERMS	iv
REFERENCES	ix
SECTION 1: CONTEXTUAL INFORMATION	1
1.1 Introduction	1
1.2 Approach	2
1.3 Scope	3
1.3.1 Legal Requirement of the EMPr	3
1.3.2 Site specific information	4
1.3.2.1 Proposed activity and local context	4
1.3.2.2 Summary of anticipated impacts associated with the proposed activity	4
1.3.2.3 Proponent's environmental management policy and commitments	5
1.3.3 Interpretations	6
1.3.4 Project phase	6
1.4 Principles of this EMPr	6
1.5 Purpose of the EMPr	7
1.6 Revision of the EMPr	7
SECTION 2: IMPLEMENTATION OF THE EMPr	8
2.1 Role players and responsibility matrix	8
2.2 Awareness Training	15
2.3 Contractor Environmental Method Statements	16
2.4 Environmental Incidents and Complaints Register	16
2.5 Emergency Procedures	17
2.6 Site Documentation	18
2.7 Pro Forma Documentation	18
2.7.1 Prior to the commencement of construction activities	18
2.7.2 During construction activities	18
SECTION 3: ENVIRONMENTAL MANAGEMENT AND MITIGATION ACTIONS	19
3.1 Preamble	19
3.2 Structure and Contents of Tables	20
3.3 Specialist Recommendations	20
SECTION 4: ENFORCEMENT, AUDITING & MONITORING	62
4.1 Auditing and Monitoring	62
4.1.1 Non-Compliance	62
4.1.2 Tolerances	63
SECTION 5: NATIONAL AND PROVINCIAL LEGISLATION, POLICIES AND GUIDELINES	64
5.1 Applicable Legislation	64
5.2 Applicable Policies and Guidelines	67
5.3 General guidelines	68
SECTION 6: DETAIL OF THE PERSON/S RESPONSIBLE FOR DEVELOPING AND REVIEWING THE EMPr	70

FIGURES

FIGURE 1: LOCALITY MAP (SEF, 2013)	1
FIGURE 2: RECOMMENDED LINES OF COMMUNICATION, REPORTING AND MONITORING	15

TABLES

TABLE 1: ANTICIPATED IMPACTS ASSOCIATED WITH THE PROPOSED ACTIVITY	4
TABLE 2: FUNCTIONS AND RESPONSIBILITIES OF THE PROJECT TEAM	8
TABLE 3: MANAGEMENT TABLE FOR GENERAL PLANNING DURING PRE-CONSTRUCTION PHASE	23
TABLE 4: MANAGEMENT TABLE FOR SPECIFIC PLANNING DURING PRE-CONSTRUCTION PHASE	26
TABLE 5: MANAGEMENT TABLE FOR MATERIALS DURING CONSTRUCTION PHASE	31
TABLE 6: MANAGEMENT TABLE FOR PLANT DURING CONSTRUCTION PHASE	36
TABLE 7: MANAGEMENT TABLE FOR CONSTRUCTION DURING CONSTRUCTION PHASE	43
TABLE 8: MANAGEMENT TABLE FOR OPERATIONS DURING OPERATIONAL PHASE	57
TABLE 9: MANAGEMENT TABLE FOR ENVIRONMENTAL AUTHORISATION CONDITIONS DURING ALL PROJECT PHASES	61
TABLE 10: FINES TABLE	ERROR! BOOKMARK NOT DEFINED.

ANNEXURES

- **ANNEXURE 1: DECLARATION OF UNDERSTANDING OF THE EMPr BY THE PROPONENT/DEVELOPER**
- **ANNEXURE 2: DECLARATION OF UNDERSTANDING OF THE EMPr BY THE PROJECT MANAGER/ENGINEER**
- **ANNEXURE 3: DECLARATION OF UNDERSTANDING OF THE EMPr BY THE CONTRACTOR**
- **ANNEXURE 4: DECLARATION OF UNDERSTANDING OF THE EMPr BY THE ENVIRONMENTAL SITE OFFICER**
- **ANNEXURE 5A: METHOD STATEMENT EXAMPLE**
- **ANNEXURE 5B: METHOD STATEMENT TEMPLATE**
- **ANNEXURE 6: ENVIRONMENTAL INCIDENT REGISTER**
- **ANNEXURE 7: COMPLAINTS REGISTER**
- **ANNEXURE 8: SPECIALIST REPORTS**

LIST OF ABBREVIATIONS AND ACRONYMS

A	Lead Authority
C	Contractor
CE	Consulting Engineer
CLO	Community Liaison Officer
D	Developer
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
ELO	Environmental Liaison
EMPr	Environmental Management Programme
GDARD	Gauteng Department of Agriculture and Rural Development
HSO	Health and Safety Officer
I&AP	Interested and Affected Party
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998), as amended
OA	Other Authority
PM	Project Manager
RE	Resident Engineer
SAHRA	South African Heritage Resource Agency
SANS	South African National Standards
SEF	Strategic Environmental Focus
SHE	Safety, Health & Environment
SIA	Social Impact Assessment
VIA	Visual Impact Assessment

GLOSSERY OF TERMS

- **Alien Invasive Species** - Plants and animals which do not occur naturally in an area - they are brought in by humans. Alien plants often force indigenous species out of the area and are invasive due to a lack of natural enemies and favourable conditions.
- **Alternative** - A possible course of action, in place of another, that would meet the same purpose and need defined by the development proposal. Alternatives considered in the EIA process can include location and/or routing alternatives, layout alternatives, process and/or design alternatives, scheduling alternatives or input alternatives. Plans or proposals for alternatives need to be approved by the ECO if part of the Record of Decision conditions (which may include the EMPr).
- **Aspect** - Element of an organisation's activities, products or services that can interact with the environment.
- **Auditing** - A systematic, documented, periodic and objective evaluation of how well the environmental management plan is being implemented and is performing with the aim of helping to safeguard the environment by: facilitating management control which would include meeting

regulatory requirements. Results of the audit help the organisation to improve its environmental policies and management systems and mitigate environmental impacts.

- **Batching area** - Site for the large-scale mixing and production of concrete or plaster, with associated equipment and materials.
- **Biodiversity** - The rich variety of plants and animals that live in their own environment. Fynbos is a good example of rich biodiversity in the Cape.
- **Built environment** - Physical surroundings created by human activity, e.g. buildings, houses, roads, bridges and harbours.
- **Bund** - Enclosure under / around a storage facility to contain any spillage.
- **Conservation** - Protecting, using and saving resources wisely, especially the biodiversity found in an area.
- **Construction activity** - Any action undertaken during the construction process by the Contractor, his Sub-contractors, suppliers or personnel or any entity acting on his behalf.
- **Construction camp/Crew camp** - The area designated for all temporary site offices, lay-down areas, storage sheds and areas, parking areas, maintenance workshops, staff welfare facilities, accommodation, etc.
- **Contamination** - The addition of foreign matter to a natural system, polluting or making something impure.
- **Contractor** - Refers to the main organization or individual which have been appointed by the Developer, through the Project Manager, to undertake construction activities on the site.
- **Corrective (or remedial) action** - Response required in order to address an environmental problem that is in conflict with the requirements of the EMPr. The need for corrective action may be determined through monitoring, audits or management review.
- **Deconstruction** - Deconstruction involves taking a structure or building apart while carefully preserving valuable elements for re-use. Also see definition for demolition.
- **Degradation** - The lowering of the condition of the environment through human activities, e.g. reducing the condition / integrity of a wetland environment due to siltation caused by upstream soil disturbance.
- **Demolition** - Refers to the activity of the tearing-down buildings and other structures, thus the opposite of construction. Demolition contrasts with deconstruction.
- **Developer** - The person or organisation responsible for building on land or for altering the use of land for a new purpose.
- **Ecology** - The scientific study of the relationship between living things (animals, plants and humans) and their environment.
- **Ecosystem** - The relationship and interaction between plants, animals and the non-living environment.
- **Engineer** - A person representing the Developer and who is responsible for the technical and contractual implementation of the works to be undertaken. This is usually the engineer, but may be any other person, such as an Architect or Project Manager, authorized by the Developer to fulfill this role.
- **Environment** - means the surroundings within which humans exist and that are made up of-
 - (i) The land, water and atmosphere of the earth;
 - (ii) Micro-organisms, plant and animal life;
 - (iii) Any part or combination of i) and ii) and the interrelationships among and between them; and
 - (iv) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

- **Environmental Aspect** - An environmental aspect is any component of a contractor's construction activity that is likely to interact with the environment.
- **Environmental Authorisation** – (Formally known as a *Record of Decision* [RoD]). A written statement from the relevant environmental authority, with or without conditions, that records its approval of a planned undertaking to build the accommodation facilities and other associated structures and infrastructure and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract.
- **Environmental Control Officer (ECO)** - Relates to an independent appointment of a consultant by the Developer or Project Manager to objectively monitor implementation of relevant environmental legislation, conditions of Environmental Authorisations (EA's), and the EMPr for the project.
- **Environmental Impact** - An impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of a construction activity. An impact may be the direct or indirect consequence of a construction activity (Also see the definition for Impact).
- **Environmental Impact Assessment (EIA)** - An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of a proposed development. The EIA includes an evaluation of alternatives; recommendations for appropriate management actions for minimising or avoiding negative impacts and for enhancing positive impacts; as well as proposed monitoring measures.
- **Environmental Management Programme (EMPr)** - The EMPr provides a description of the methods and procedures for mitigating and monitoring impacts associated with the project in order to ensure that activities are conducted and managed in an environmentally sound and responsible manner. The EMPr can also contain environmental objectives and targets which the project proponent or developer needs to achieve in order to reduce or eliminate negative impacts.
- **Environmental policy** - Statement of intent and principles in relation to overall environmental performance, providing a framework for the setting of objectives and targets.
- **Environmental Site Officer** - An employee of the Contractor to act as his/her environmental representative to monitor, review and verify compliance with the EMPr by the contractor. This is not an independent appointment as the ESO must be a respected member of the contractor's management team.
- **Environmental specifications** - Specifications, instructions and guidelines designed to help prevent, reduce and/or control the potential environmental implications as a result of the development and any associated activities.
- **Habitat** - The physical environment that is home to plants and animals in an area, and where they live, feed and reproduce.
- **Hazardous waste** - Waste, even in small amounts, that can pollute, contaminate or cause damage to plants, animals, their habitat and the well-being of human beings, e.g. waste from factories, detergents, pesticides, hydrocarbons, paint containers, shutter oil, glaze, bitumen, glue containers, electronic waste etc.
- **Impact** - A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.
- **Indigenous species** - Plants and animals that are usually located in a specific region as a result of only natural processes, with no human intervention.
- **Infrastructure** - The network of facilities and services that are needed for economic activities, e.g. roads, electricity, water, sewerage.

- **Integrated** - Mixing or combining all useful information and factors into a joint or unified whole. See Integrated Environmental Management.
 - **Integrated Environmental Management (IEM)** - A way of managing the environment by including environmental factors in all stages of development. This includes thinking about physical, social, cultural and economic factors and consulting with all the people affected by the proposed developments. Also called "IEM".
 - **Interested and Affected Party** - Refers to an interested and affected party contemplated in section 24(4)(d) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and which in terms of that section includes –
 - Any person, groups of persons, organization interested in or affected by an activity, and;
 - Any organ of state that may have jurisdiction over any aspect of the activity.
 - **Land use** - The use of land for human activities, e.g. residential, commercial, industrial use.
 - **Lead Authority** - The Lead Authority is the relevant environmental department (National or Provincial) who is responsible for issuing an Environmental Authorisation. This authority is responsible for ensuring that monitoring of the EMPr and other authorisation documentation is carried out (in this case; the Gauteng Department of Agriculture and Rural Development).
 - **Material Safety Data Sheet (MSDS)** - Material Safety Data Sheet (MSDS) is a form with data regarding the properties of a particular substance. This document contains information on the potential health and environmental effects of the applicable substances as well as safe working procedures users should adhere to when handling the substance. Furthermore, the document details treatment measures to mitigate impacts on the environment in the event of spillages.
 - **Method Statements** - Method Statements are written submissions to the Engineer / Project Manager by the Contractor in collaboration with his/her ESO. The Method Statements must address the following for each applicable activity to be undertaken during the project:
 - Materials and equipment to be used;
 - Getting the equipment to and from site;
 - How the equipment/material will be moved while on site;
 - How and where material will be stored;
 - The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or solid material that may occur;
 - Timing and location of activities;
 - Compliance/ non-compliance with the Specifications; and
 - Any other information deemed necessary by the PM.
- The Method Statements must contain the appropriate detail in order for the EO and Engineer / Project Manager to assess whether the Contractor's proposal is in accordance with the requirements of the EMPr. The contractor must sign each Method Statement along with the EO (or ECO on projects where no EO is present) and Engineer / Project Manager to formalise the approved Method Statement.
- **Mitigation** - Measures designed to avoid, reduce or remedy adverse impacts on the environment due to construction activities.
 - **Natural environment** - Our physical surroundings, including plants and animals, when they are unspoiled by human activities.
 - **No-Go Area** - Areas where construction activities and construction personnel are prohibited.
 - **Over-utilisation** - Over-using resources - this affects their future use and the environment.
 - **Policy** - A set of aims, guidelines and procedures to help you make decisions and manage an organisation or structure. Policies are based on people's values and goals. See Integrated Metropolitan Environmental Policy.

- **Pollution** - According to the National Environmental Management Act, No. 107 of 1998, pollution can be defined as, *“Any change in the environment caused by (i) substances; (ii) radioactive or other waves; or (iii) noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.”*
- **Process** - Development usually happens through a process - a number of planned steps or stages.
- **Proponent** – Also known as the Developer. Entity which applies for environmental approval and is ultimately accountable for compliance to conditions stipulated in the Environmental authorisation (EA) and requirements of the EMPr.
- **Rehabilitation** - Rehabilitation is the process of returning a disturbed area, feature or structure to a natural state meaning to the state that it was before disruption (where possible), or to an improved state.
- **Recycling** - The practice of sorting and collecting waste materials for new use.
- **Resources** - Parts of our natural environment that we use and protect, e.g. land, forests, water, wildlife, and minerals.
- **Solid waste** - Any solid undesirable or superfluous by-product or remainder of any process or activity. This includes construction debris, chemical waste, cement/concrete remains, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. foodstuffs, clothing, packaging materials such as glass, paper and cardboard, plastics, and, in certain cases, ash).
- **Stakeholders** - A subgroup of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term includes the proponent, authorities and all interested and affected parties.
- **Storm water management** - Strategies implemented to control the surface flow of storm water such that erosion, sedimentation and pollution of surface and ground water resources in the immediate and surrounding environments are mitigated. This is specifically important during the construction and decommissioning phases of a project.
- **Sustainable development** - Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
- **Sustainability** - The capacity to support, maintain or endure.
- **Visual impact** - Changes to the visual character of available views resulting from the development that include: obstruction of existing views; removal of screening elements thereby exposing viewers to unsightly views; the introduction of new elements into the view shed experienced by visual receptors and intrusion of foreign elements into the view shed of landscape features thereby detracting from the visual amenity of the area.
- **Waste Management** - Categorization, classifying, recycling, treatment and disposal of waste generated during construction and decommissioning activities.
- **Working area** - Any area within the boundaries of the Site where active construction takes place including any working space.
- **Zoning** - The control of land use by only allowing specific type development in fixed areas or zones

REFERENCES

DEA (1992) Integrated Environmental Management Guideline Series, Volumes 1-6, Department of Environmental Affairs, Pretoria.

DEA (2004a) Environmental Management Plans, Integrated Environmental Management, Information Series 12, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DWA (1994). Waste Management Series. Minimum Requirements for Waste Disposal by Landfill, Department of Water Affairs and Forestry (1994), Pretoria.

City of Cape Town: Environmental Management Programme (2002) Specification EM – 02/07: Environmental Management, Ver 5 (03/2002)

Lochner, P. 2005. Guideline for Environmental Management Plans. CSIR Report No ENV-S-C 2005-053 H. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.

Republic of South Africa. 1998. National Environmental Management Act 107 of 1998 (NEMA).

SECTION 1: CONTEXTUAL INFORMATION

1.1 INTRODUCTION

Strategic Environmental Focus (Pty) Ltd (SEF), as independent Environmental Assessment Practitioners (EAP)/Environmental Consultants, has been appointed by Huddle Investments (Pty) Ltd to compile and submit an Environmental Management Programme (EMPr) to the decision making authority (The Gauteng Department of Agriculture and Rural Development) for the proposed Huddle Township Development situated on Portion 84 (a portion of the remainder) of the Farm Bedford 68 IR, Linksfield, City of Johannesburg Metropolitan Municipality (CJMM), Gauteng Province. Refer to figure 1 below for a locality map.



Figure 1: Locality Map (SEF, 2013)

This document represents the draft Environmental Management Programme (EMPr) compiled in support of the EA application which is currently underway for the proposed Huddle Township Development. The draft EMPr incorporates the environmental mitigation/management measures associated with the pre-construction, construction and operational phases with the inclusion of those specific mitigation/management measures which arise from the EIA process and specialist studies compiled in support of the EA application.

1.2 APPROACH

This document is compiled in accordance with the Integrated Environmental Management (IEM) philosophy which aims to achieve a desirable balance between conservation and development (DEAT, 1992). IEM is a key instrument of the National Environmental Management Act [NEMA] (Act No. 107 of 1998). NEMA promotes the integrated environmental management of activities that may have a significant effect on the environment, while IEM prescribes a methodology for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental management tools that are appropriate for the various levels of decision-making. One such tool is an EMPr.

The IEM guidelines encourage a pro-active approach to sourcing, collating and presenting information in a manner that can be interpreted at all levels. The basic principles underpinning IEM are that there be:

- informed decision-making;
- accountability for information on which decisions are taken;
- accountability for decisions taken;
- a broad meaning given to the term environment (i.e. one that includes physical, biological, social, economic, cultural, historical and political components);
- an open, participatory approach in the planning of proposals;
- consultation with interested and affected parties;
- due consideration of alternative options;
- an attempt to mitigate negative impacts and enhance positive aspects of proposals;
- an attempt to ensure that the 'social costs' of development proposals (those borne by society, rather than the developers) be outweighed by the 'social benefits' (benefits to society as a results of the actions of the developers);
- democratic regard for individual rights and obligations;
- compliance with these principles during all stages of the planning, implementation and decommissioning of the proposals (i.e. from 'cradle to grave'); and
- the opportunity for public and specialist input in the decision-making process.

These principles are in line with NEMA, which has repealed a number of the provisions of the Environment Conservation Act, 1989 [ECA] (Act No. 73 of 1989), and is focussed primarily on co-operative governance, public participation and sustainable development. The Environmental Impact Assessment Regulations 2006, which was replaced by the Environmental Impact Assessment Regulations 2010 that took effect in August 2010, regulate the procedures and criteria for the submission, processing, consideration and decision on applications for environmental authorisation (EA) of listed activities.

1.3 SCOPE

1.3.1 Legal Requirement of the EMPr

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Regulations, 2010, an Environmental Management Programme (EMPr) must accompany the environmental impact assessment report. The EMPr, which must comply with section 24N of the Act, must include all the information specified in Regulation 33 of the EIA Regulations, Regulations published as Government Notice (GN) No R. 543 in Government Gazette No 33306 of 18 June 2010 in terms of Chapter 5 of the National Environmental Management Act No 107 of 1998 (NEMA), and include -

- a) Details of –
 - (i) the person who prepared the EMPr; and
 - (ii) the expertise of that person to prepare an EMPr;
- b) Information on any management of mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of –
 - (i) Planning and design;
 - (ii) Pre-construction and construction activities;
 - (iii) Operation and undertaking of the activity;
 - (iv) Rehabilitation of the environment; and
 - (v) Closure, where relevant.
- c) A detailed description of the aspects of the activity that are covered by the environmental management plan;
- d) An identification of the persons who will be responsible for the implementation of the measures contemplated in paragraph (b);
- e) Proposed mechanisms for monitoring compliance with the EMPr and reporting thereon;
- f) As far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land-use which conforms to the generally accepted principle of sustainable development, including, where appropriate, concurrent or progressive rehabilitation measures;
- g) A description of the manner in which it intends to -
 - (i) Modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
 - (ii) Remedy the cause of pollution or degradation and migration of pollutants;
 - (iii) Comply with any applicable provisions of the Act regarding closure, where applicable;
 - (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;
- h) Time periods within which the measures contemplated in the environmental management programme must be implemented;
- i) The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity;
- j) 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 must be dealt with in order to avoid pollution or the degradation of the environment; and
- k) Where appropriate, closure plans, including closure objectives.

This EMPr as developed for the proposed Huddle Township Development is based on the requirements of Regulation 33 of the EIA Regulations (GNR 543), as detailed above.

1.3.2 Site specific information

1.3.2.1 Proposed activity and local context

The proposed Huddle Township Development will be located on Portion 84 (a portion of the remainder) of the Farm Bedford 68 IR, Linksfield, City of Johannesburg Metropolitan Municipality (CJMM), Gauteng Province, South Africa.

The proposed development will be approximately 53ha in extent and provides for the development for a residential estate, a small neighbourhood node that will consist of retail facilities, some offices and a component of higher density residential apartments and a public and private road system.

The proposed Huddle Township Development will primarily consist of 314 residential erven ranging in size from 450m² and 1 000m², two small pockets of cluster developments (33 units) and one higher density apartment development (110 units) and a small neighbourhood node (maximum gross leasable area of 10 000m²) consisting of speciality stores and services (such as a grocery store, a Postnet, banking facilities, internet cafes, hairdressers, etc.), appropriately scaled offices targeted at small and medium size businesses, as well as a lifestyle component. The proposed development will also have a private open space system that provides for landscaped recreational areas and pedestrian linkages as well as integrated stormwater management.

The proposed site currently forms part of a portion of what used to be the Huddle Park Golf Course.

1.3.2.2 Summary of anticipated impacts associated with the proposed activity

Table 1: Anticipated impacts associated with the proposed activity

ENVIRONMENTAL ASPECT	RELEVANT AREA	ENVIRONMENTAL OBJECTIVE	POTENTIAL IMPACTS
Erosion	Site	To prevent the loss of nutrient rich topsoil; Effectively manage storm water; To prevent gully erosion or significant erosion.	<ul style="list-style-type: none"> • Soil erosion during construction and operational phases
Terrestrial Ecology	Site & Local Area	To ensure that natural vegetation and habitat is not totally destroyed; To not interfere with fauna and faunal breeding activities.	<ul style="list-style-type: none"> • Loss of species of conservation importance, disruption of natural processes and functionality; and • Establishment of alien invasive plant species and declared weeds.

ENVIRONMENTAL ASPECT	RELEVANT AREA	ENVIRONMENTAL OBJECTIVE	POTENTIAL IMPACTS
Safety & Security	Site & Local Area	To ensure safety within the site, particularly to prevent trespassers from neighbouring areas.	<ul style="list-style-type: none"> • Trespassers; and • Threat to safety of residents of the area.
Heritage and Culture	Site	To ensure that all artefacts and symbols of culture and heritage significance are identified & preserved.	<ul style="list-style-type: none"> • Loss of significant symbols of heritage and culture.
Soils	Local Area	Prevent surface and water contamination.	<ul style="list-style-type: none"> • Altered flow regimes as a result of hardened surfaces; • Potential contamination of groundwater (due to aspects such as hydrocarbons and sewerage); and • Disruption of natural drainage patterns.
Hydrology	Local Area	To maintain a suitable quality of surface- and ground water to be deposited into hydrological systems	<ul style="list-style-type: none"> • Contaminants occurring as a result of construction (e.g. hydrocarbons and litter) might end up in the hydrological system.
Geotechnical instability	Site	To ensure that the foundations are suitable for development and/or the necessary measures are implemented in order to ensure its suitability.	<ul style="list-style-type: none"> • Subsidence, cracking of built structures; and • Unstable foundations.
Air pollution	Site & Local Area	To prevent the further pollution of the air in the area during the construction and operation phases of the development To avoid possible Anthrax infections.	<ul style="list-style-type: none"> • Increased airborne particulate matter and emissions due to construction activities; and improper rehabilitation procedure. • Possible Anthrax contamination due to the uncovering of infected skeletons.
Noise	Site & Local Area	To minimise the effect of noise on surrounding residents both during construction.	<ul style="list-style-type: none"> • Noise limits being exceeded.
Visual impact	Site & Local Area	To minimise light and visual pollution; To ensure that the development blends in with the landscape character; To minimise unsightly views during the construction phase.	<ul style="list-style-type: none"> • Visual Impacts to surrounding land users; and • Alteration of Landscape Character.
Traffic impact	Local Area	To reduce the effects of construction activities on the local traffic patterns.	<ul style="list-style-type: none"> • Traffic congestion due to construction activities.
Socio-economic	Regional	To assure that the development is sustainable through employment, transfer of skills and training of local people.	<ul style="list-style-type: none"> • Employment; and • Social upliftment.

1.3.2.3 Proponent's environmental management policy and commitments

Huddle Investments (Pty) Ltd. would ensure that the environmental management policy; objectives; and vision of South Africa, as managed by the National Department of

Environmental Affairs (DEA), are upheld. This policy emphasises that integrated and sustainable management of the environment, now and in the future, is the essential basis of sustainable development in all areas of human activity. Therefore adherence to the principles and guidelines defined within the Integrated Environmental Management (IEM) procedure is essential.

1.3.3 Interpretations

The implementation of the EMPr is not an additional or “add on” requirement. The EMPr is legally binding through NEMA and once approved by the Competent Authority. The proponent is to ensure that through the project tender process the EMPr forms part of the Project Construction Contract Document, to be incorporated in line with:

- a) General project specifications; and
- b) Relevant Standards, Guidelines and Publications (i.e. SANS Standards, etc.), as applicable.

1.3.4 Project phase

The general principles contained within this EMPr is specifically compiled and applies to all **PRE-CONSTRUCTION, CONSTRUCTION & OPERATIONAL** activities associated with the proposed Huddle Township Development.

1.4 PRINCIPLES OF THIS EMPR

This EMPr is compiled using the following concepts and implementation requirements so that the higher principles of sustainable development are realised:

- Continuous improvement. The project proponent (or implementing organisation) must commit to review and to continually improve environmental management, with the objective of improving overall environmental performance.
- Broad level of commitment. A broad level of commitment is required from all levels of management as well as the workforce in order for the development and implementation of this EMPr to be successful and effective.
- Accountability. A strong sense of accountability should be maintained by the proponent, contractor and sub-contractor to prevent any party from distancing itself from commitments made to the EMPr.
- Flexible and responsive. The implementation of the EMPr must respond to new and changing circumstances, i.e. rapid short-term responses to problems or incidents. The EMPr is a dynamic “living” document and thus regular planned review and revision of the EMPr must be carried out.
- Integration across operations. This EMPr must integrate across existing line functions and operational units such as health, safety and environmental departments in a company/project. This is done to change the redundant mindset of seeing environmental management as a single domain unit.
- Legislation. It is understood that any development project during all its phases is a dynamic process within a dynamic environment. The Developer, Engineer, Contractor and Sub-contractor must therefore be aware that certain activities conducted during construction may require further licensing or environmental approval, e.g. river or stream diversions, bulk fuel storage, waste disposal, etc. The Contractor must consult the RE and ECO on a regular basis in this regard.

1.5 PURPOSE OF THE EMPR

This EMPr has been prepared to provide for the methods and procedures applicable to the mitigation of potential adverse environmental impacts associated with the proposed Huddle Township Development; and contain specific objectives and/or targets which provide the standards for monitoring and assessing the implementation thereof. EMPr's essentially provide for the link between the environmental impacts which were predicted; the associated mitigation measures specified during the assessment phase; and the effective implementation of the said mitigation measures (DEAT, 2004).

Specific objectives central to this EMPr are:

- Provide for and define measures which arise from the EIA process, to ensure the effective management of unavoidable adverse environmental impacts associated with the project proposal;
- Provide and define a framework for the appropriate implementation of the relevant environmental management/mitigation measures specified in/during the EIA process;
- Provide and define the roles and responsibilities of various parties to ensure the effective implementation of the environmental management/mitigation measures specified; and
- Provide and define monitorable standards to ensure the effective assessment of compliance to/with the relevant environmental management/mitigation measures specified.

1.6 REVISION OF THE EMPR

The EMPr must be seen as a “**living**” document. As such, the EMPr and its associated environmental specifications may be amended subject to probable cause. Causes constituting the need for updating or amending of the EMPr may include:

- Instructions from the Lead Authority to do so;
- Significant change in applicable environmental legislation; and
- Significant changes to circumstances on site, subject to approval from the Lead Authority.

Although the EMPr is a living, functioning and dynamic document; no significant changes may be made without approval from the Lead Authority once it has been approved. The amendment process should be undertaken as specified in Regulation 46 of the EIA Regulations, Regulations published as Government Notice (GN) No R. 543 in Government Gazette No 33306 of 18 June 2010 in terms of Chapter 5 of the National Environmental Management Act No 107 of 1998 (NEMA)

SECTION 2: IMPLEMENTATION OF THE EMPR

2.1 ROLE PLAYERS AND RESPONSIBILITY MATRIX

In order for the EMPr to be successfully implemented, all the role players involved in the project need to co-operate. For this to happen, role players must:

- Clearly understand their roles and responsibilities in the project;
- Must be professional;
- Form respectful and transparent relationships; and
- Maintain open lines of communication.

Potential role players or project teams will include the Authorities (A), Other Authority (OA), Developer/Proponent (D), Consulting Engineers (CE), Engineers Representative (ER), Environmental Site Officer (ESO), Environmental Control Officer (ECO), Project Manager (PM), Contractors (C), Environmental Assessment Practitioner (EAP). Further; landowners, interested and affected parties and the relevant environmental and project specialists are also important role players.

Please refer to Table 1 below for a representation of the different roles and responsibilities as well as Figure 2 for recommended communication lines.

Note that although Huddle Investments (Pty) Ltd is the Developer/Proponent, it is anticipated that certain areas such as Estates for individual houses will be handed over to a Managing Body. At the time of handover, all responsibilities of the “Proponent/Developer” will revert from Huddle Investments (Pty) Ltd to the Managing body.

Table 2: Functions and Responsibilities of the Project Team

DESIGNATION	ROLE	RESPONSIBILITIES
Authority (A)	Responsible for issuing of the relevant Environmental Authorisation (if applicable), overall environmental management within the province and ensuring compliance with all applicable environmental legislation and specifications (such as the EMPr and EA conditions). In this case the GDARD.	The authorities are responsible for ensuring that the monitoring of the EMPr is carried out, this will be achieved by: <ul style="list-style-type: none"> • Conducting regular site visits; • Review Audit Reports submitted by the ECO; • Requesting and viewing Environmental Incident Report; • Requesting and viewing of Complaints Registers; and • Issuing directives, notices and/or fines for significant transgressions with the EMPr or environmental legislation.

DESIGNATION	ROLE	RESPONSIBILITIES
<p>Other Authority (OA)</p>	<p>Includes organisations and bodies like Municipalities, Heritage Resource Agencies, National Department of Water, etc. Other authorities are those that may be involved in the approval process of an EMPr or issuing and enforcing of relevant licenses / approvals.</p>	<ul style="list-style-type: none"> • May be required to review EMPr's and provide comment to ensure the accuracy of the information relevant to their specific mandate. • May be involved in the development, review or implementation of an EMPr (e.g. if a specific development requires consent from a relevant authority, then that authority should review and comment on the content of the particular EMPr).
<p>Developer/ Proponent (D/P)</p>	<p>Proponent/Developer who is ultimately accountable for ensuring compliance to the EMPr and good management practice requirements for the duration of the project. <i>[*Note that although Huddle Investments (Pty) Ltd is the Developer/Proponent, it is anticipated that certain areas such as Estates for individual houses will be handed over to a Managing Body. At the time of handover, all responsibilities of the "Proponent/Developer" will revert from Huddle Investments (Pty) Ltd to the Managing body.]</i></p>	<ul style="list-style-type: none"> • Ensuring that the prospective Tenderers/Contractors adequately provide for the provisions of the EMPr in their submissions. • Appointing an independent ECO to objectively monitor implementation of relevant environmental legislation and requirements of the EMPr for the project. • Support and provide mandate to enable the ECO to perform responsibilities. • Ensuring that the ECO is integrated as part of the project team. • Establishing and maintaining proactive communications with the Contractor and ECO. • Undertaking periodic site visits and inspections to ensure that the environmental requirements are implemented. • Reviewing and commenting on environmental compliance assessments and/or reports. • Giving instructions on any procedures and corrective actions. • Ensuring that the EMPr is fully implemented and remains so, and when necessary is revised and updated. • Reviewing the Complaints Register. • Approving the issuance of fines, penalties or suspending work for contravention of the EMPr. • Giving instructions regarding corrective action to the Contractor/PM.

DESIGNATION	ROLE	RESPONSIBILITIES
<p>Project Manager (PM)</p>	<p>The Project Manager has over-all responsibility for managing the project, contractors, and consultants and for ensuring that the environmental management requirements including EMPr implementation, compliance and environmental related activities, issues and impacts are met.</p>	<ul style="list-style-type: none"> • Understanding the EMPr and all its specifications and implications. • Ensuring that all aspects and specifications of the EMPr and approved Method Statements are implemented. • Enforcing the implementation of the EMPr and ensuring that Contractor and Subcontractor employees comply with the EMPr. • Reviewing and commenting on environmental compliance assessments and/or reports. • Monitoring environmental impacts and verifying that they are kept to a minimum at all times. • Approving all decisions regarding environmental procedures. <u>Note</u> that all decisions regarding environmental procedures must be approved by the PM. • Overseeing site works. • Taking action to address all EMPr, Method Statement and/or environmental legislation non compliances as well as keeping record of these actions. • Issuing penalties for contravention of the EMPr to Contractor and Sub-contractor (as deemed necessary). • Stopping any construction activity which is in contravention of the EMPr in accordance with an agreed warning procedure. • Recording and informing the CE and ECO of incidents or problems while implementing the EMPr as well as recommending ways of resolving these incidents or problems. • Reporting and recording all accidents and incidents resulting in injury, death or significant environmental liability immediately to the D/P and ECO. • Recording all public complaints received and immediately inform the D/P and ECO of these. • Ensuring that proper records are kept of all compliance status/feedback reports, incident reports and complaints register and that these documents are available for auditing by the PM, Authorities or ECO upon request. • Communicating the content of the ECO reports and any advice received from the ECO (verbally / in writing) to Contractor and Sub-contractors employees. • Designating the working areas and ensuring that these are managed (including sensitive environments) as per the approved construction site layout plan.

DESIGNATION	ROLE	RESPONSIBILITIES
<p>Consulting Engineer (CE)</p>	<p>Contracted by the developer to design and specify the project engineering aspects. Generally the engineer runs the works contract. The CE may also fulfil the role of Project Manager on the proponent's behalf (See PM).</p>	<ul style="list-style-type: none"> • Understanding the EMPr and all its specifications and implications. • Ensuring that the tendered Contractor fully comply with the EMPr and all its relevant specifications in the supplied Tender; • Making himself / herself, as well as any other identified key members, available for induction training on the EMPr by the ECO. • Notifying the Project Team and ECO of the proposed programme for works to be undertaken during the project and to fully disclose all details of the activities involved even when occurring off-site. • Ensuring that the EMPr specifications (of this document including any revisions, additions or amendments) are effectively implemented. • Assist the ECO in ensuring that the conditions of the EMPr are being adhered to and promptly issue instructions requested by the ECO, to the Contractor. All site instructions relating to environmental matters issued by the Engineer are to be copied to the ECO • Implementing on-site steps to mitigate environmental impacts. • Assist the ECO in making decisions and finding solutions to environmental problems that may arise during the construction phase; • Providing motivation and/or alternative specifications through Method Statement(s) for any deviation from or 'tailor making' of the EMPr for consideration. • Signing off on approved Method Statements. • Ensuring that all approved Method Statements are effectively implemented during undertaking of the relevant activity. • Order the removal of person(s) and/or equipment not complying with the environmental specifications. • Issue of penalties for transgressions of Environmental Specifications (if so delegated by the PM). • Provide input into the ECO's ongoing internal review of the EMPr. • Ensuring that all employees, contractors and sub-contractors employed comply with the requirements and provisions of the EMPr at all times. • Appointing competent, experienced and responsible individuals to administer and implement EMPr with regard to engineering and construction. • Reporting of any serious environmental incidents or impacts to the D/P, PM and ECO
<p>Engineers Representative (ER)</p>	<p>Acting as the consulting engineer's (CE's) representative and is on site on a daily basis.</p>	<ul style="list-style-type: none"> • All responsibilities as stated for the CE applies. • Overseeing site works. • Issuing site instructions / variation orders to the contractor, following request by the EO or ECO • May act as the liaison with the Contractor and ECO.

DESIGNATION	ROLE	RESPONSIBILITIES
<p>Contractor (C)</p>	<p>The <u>principle contractor</u>, known from hereon as the “Contractor” implements and complies with the requirements of the EMPr and relevant environmental legislation.</p> <p>The Contractor must ensure that all sub-contractors have a copy of and are fully aware of the content and requirements of this EMPr.</p> <p><i>{Term “Contractor” is relevant to those entities undertaking activities on the properties as referred to in the Environmental Authorisation. These contractors should be managed by the relevant Developer/Proposal. Please see the role and responsibility for Developer/Proposal for clarification.}</i></p>	<ul style="list-style-type: none"> • Making him / her, as well as any employee deemed necessary, available for induction training on the requirements of the EMPr. • Familiarise himself/herself with all relevant sections and specifications of the EMPr as well as the approved Method Statements in order to gain a full understanding of the requirements. • Implementing all relevant EMPr sections, specifications and approved Method Statements in accordance with the requirements of the Developer/Proponent and the Environmental Authorisation. • Preparing and providing Environmental Method Statements (setting out in detail how the management actions contained in the EMPr will be implemented) as required by the EMPr and per the Developer’s instructions. • Being responsible for the employees of all Sub-contractors and ensure that all of its sub-contractors, employees, suppliers or agents etc. are fully aware of the environmental requirements detailed in the Environmental Specifications of the EMPr and EA. • Notify the Developer/ECO of any and all ‘near misses’, incidents, accidents and transgressions on site with respect to environmental management and non-compliance with the latest EMPr version, EA and approved Method Statements and seek advice for required corrective actions and/or site remediation. • Recording and reporting all incidents and complaints received to the D/P, PM and ECO. • Liaise closely with the PM, ER and the ECO and ensure that the works on site are conducted in an environmentally sensitive manner; • Carry out instructions issued by the PM or Engineer required to fulfil his/her compliance with the EMP.

DESIGNATION	ROLE	RESPONSIBILITIES
<p>Environmental Site Officer (ESO)</p>	<p>The ESO is employed by the Contractor as his/her environmental representative to monitor, review and verify compliance with the EMPr by the contractor.</p>	<ul style="list-style-type: none"> • Making him / her available for induction training on the requirements of the EMPr. • Assisting in preparing of Environmental Method Statements (setting out in detail how the management actions contained in the EMPr will be implemented) as required by the EMPr and per the PM's/ER's instructions. • Familiarise himself/herself with all relevant sections and specifications of the EMPr as well as the approved Method Statements in order to gain a full understanding of the requirements. • Implementing and ensuring compliance with all relevant EMPr sections, specifications and approved Method Statements. • Conducting an induction and an ad-hoc environmental awareness training session with all Contractor and Sub-contractors employees. • The ESO will be responsible for conducting environmental toolbox talks to employees for the duration of construction. • Being involved in all phases of the construction (from site clearance to rehabilitation). • Conducting periodic inspections to monitor compliance with the EMP. • Providing monthly (or more often) feedback to the ECO on potential environmental problems associated with the development. • Assisting the Contractor in finding environmentally responsible solutions to problems. • Keeping accurate and detailed records of all activities, incidents and compliants on site. • Ensuring that the required actions are undertaken to mitigate the impacts resulting from non-compliance. • Reporting all incidences of non-compliance to the ECO and Contractor. • Responsible for the day-to-day environmental management on site.

DESIGNATION	ROLE	RESPONSIBILITIES
<p>Environmental Control Officer (ECO)</p>	<p>An independent appointment as an advisory consultancy, monitoring and reporting role to objectively monitor implementation of relevant environmental legislation, conditions of Environmental Authorisations (EA's), and the EMPr for the project. Updating of the EMPr and making recommendations for addressing EMPr and/or environmental legal non-compliances. Liaising with the relevant Environmental Authorities on environmental issues and confirming their requirements, as well as communicating such requirements to the Developer, Consulting Engineer and/or PM. The ECO must be suitably experienced with the relevant environmental management qualifications and preferably competent in construction related methods and practices.</p>	<ul style="list-style-type: none"> • Being pro-active throughout the project which includes access to specialist expertise (botanists, ecologists, etc.) as and when required. • Advising the CE, PM and D/P on any necessary environmental authorisations and permits that would be needed to be applied for. • Revising and updating the EMPr as and when necessary and submit such updates to the CE, PM and Lead Authority for review. • Submitting copies of revised EMPr to all relevant stakeholders for their information and review. • Performing Environmental Induction on the contents of this EMPr to the site team (PM, CE/ER, CR, DEO and Contractor) and discuss the contents in detail prior to them starting any work on site (once-off). • Keeping record of everyone who attended the EMPr introduction training course. • Reviewing and approving construction method statements with input from the DEO and Engineer, where necessary, in order to ensure that the environmental specifications contained within this EMPr and Environmental Authorisation are adhered to. • Handling and addressing of information received from whistle blowers as confidential and reporting these incidences to the relevant Authority as soon as possible • Maintaining a photographic record of the site prior, during and after construction activities is undertaken. • Conducting audits on compliance to relevant environmental legislation, conditions of EA, and the EMPr for the project at a frequency as determined by the Lead Authority. • Validating Environmental Site Documentation and Records (Toolbox talks, service receipts, complaints, incidents, monitoring, etc.). • Monitoring that environmental impacts are kept to a minimum. • Immediately reporting any serious environmental incidents or impacts to the D/P, PM and/or CE. • Preparing of monitoring/audit reports which reflect the EMPr compliance status, findings, issues and recommendations for addressing non-compliances and submitting these to the project team and Lead Authorities (when requested). • Keeping record of EMPr audits, monitoring and incidents. • Reviewing and commenting on all Environmental Method Statements and making recommendations to the CE or ER on whether or not to accept the Method Statement and/or if any amendments or revisions is required. • Making recommendations on any additional Method Statements that may be required as construction activities progress.
<p>Environmental Assessment Practitioner (EAP)</p>	<p>Appointment by the Developer to handle all applications for Environmental Authorisations and conducting of specialist studies as required by the Lead Authority.</p>	<p>The definition of an environmental assessment practitioner in Section 1 of NEMA is “<i>the individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management plans or any other appropriate environmental instruments introduced through regulations</i>”.</p>

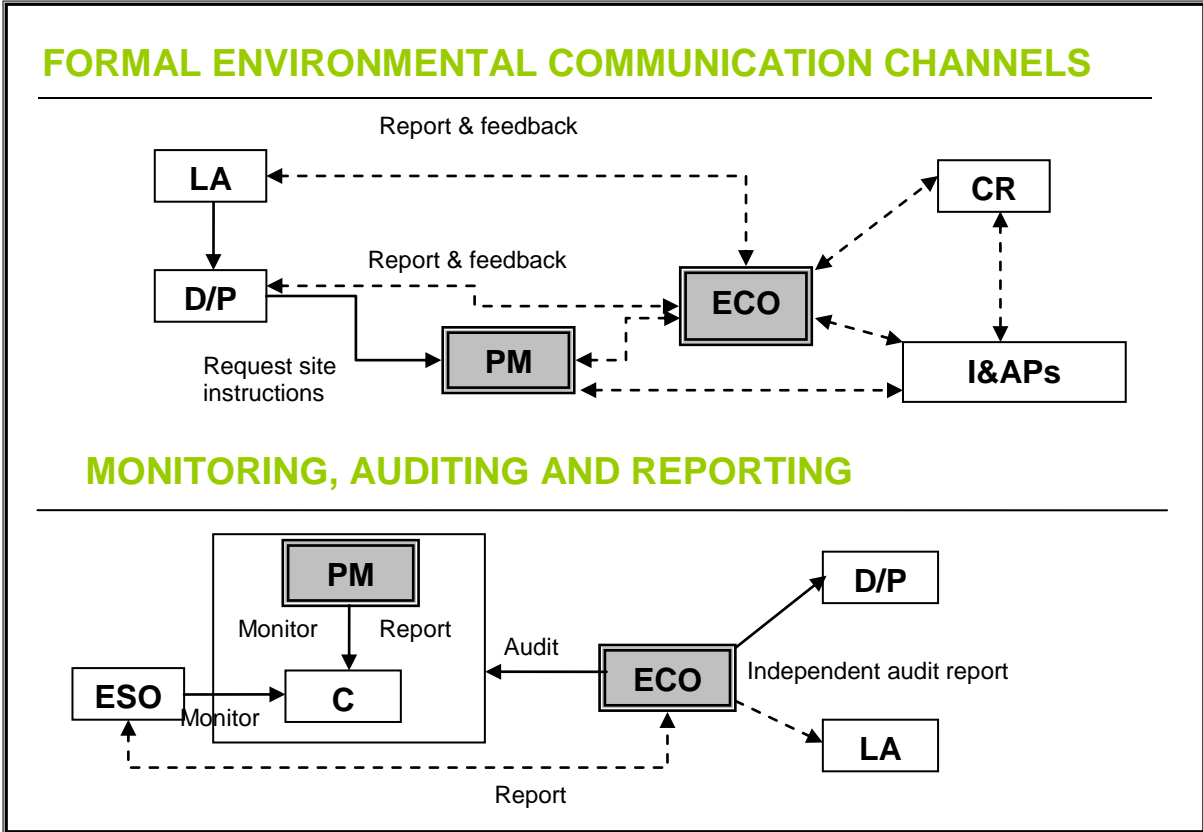


Figure 2: Recommended lines of communication, reporting and monitoring

2.2 AWARENESS TRAINING

This EMPr is drafted in accordance to the principles of the National Environmental Management Act (No. 107 of 1998) [NEMA], as amended; which constitute that development must be sustainable. Sustainable development is planned to meet the needs of present and future generations, e.g. the need for basic environmental, social and economic services. Sustainable development includes using and maintaining resources responsibly.

Under Section 28 of NEMA (Duty of Care) provision is made that anyone who causes or is likely to cause pollution or degradation of the environment; is responsible for preventing impacts occurring, continuing or recurring as well as for the costs of repair to the environment.

One tool to make provision for sustainable development is the awareness making of the workforce on the requirements and commitments of the EMPr. The ESO is responsible for ensuring everyone on site is given an environmental awareness induction session, prior to commencement of construction, which not only clearly defines what the environment is and gives specifics detailing the local environment but outlines the requirements of the EMPr as a management tool to protect the environment.

Refresher courses must be conducted as and when required. The ESO must ensure periodic environmental toolbox talks include alerting the workforce to particular environmental concerns associated with the tasks for that day or the area/habitat in which they are working. Additional media

such as awareness posters and hand outs must be considered to create awareness throughout the site.

2.3 CONTRACTOR ENVIRONMENTAL METHOD STATEMENTS

Method Statements are written submissions to the Engineer/PM by the Contractor in collaboration with his/her ESO, in response to a request by the ECO/PM and or Engineer. The Method Statements set out the plant, materials, labour and method that the contractor proposes using to carry out an activity, identified by the ECO/PM and/or Engineer. The Method Statements contain the appropriate detail such that the ECO/PM and Engineer are able to assess whether the Contractor's proposal is in accordance with the requirements of the EMPr. The contractor must sign each Method Statement along with the ECO/PM and Engineer to formalise an approved Method Statement.

All Method Statements, including those which may be required as *ad hoc* or emergency construction method statements, must be submitted to the Engineer/PM/ECO for approval prior to the commencement of the activity. Any changes to the method of works must be reflected by amendments to the original approved Method Statement. Any changes in this regard must be approved by the ECO/PM/Engineer on the understanding that such changes are environmentally acceptable and in line with the requirements of this EMPr.

The *pro forma* Method Statements for the following activities listed below must be submitted to the ECO/PM and/or Engineer for approval before construction commences (Refer to Annexure 1 and 5 for templates which may be used). These include *inter alia*:

- Solid waste management;
- Hazardous waste management;
- Storage of Hazardous Materials and Chemicals;
- Crew camps and construction lay down areas;
- Workshop and maintenance/cleaning of plant;
- Cement and concrete batching;
- Dust control;
- Traffic control;
- Hydrocarbon and emergency spills procedures;
- Diesel tanks and refuelling procedures;
- Sourcing, excavating, transporting and dumping of fill and spoil material;
- Topsoil management;
- Fire;
- Conservation of Heritage Resources; and
- Rehabilitation of crew camp and other disturbed areas.

2.4 ENVIRONMENTAL INCIDENTS AND COMPLAINTS REGISTER

All environmental incidents occurring on the site must be recorded by the contractor in an Environmental Incident Register (Refer to Annexure 6 for a sample) kept on site. Recording of incidents will assist in identifying trends and determining the root cause of aspects, ensuring that

overall environmental management on site improves. Incidents must be submitted to the PM/Engineer and the ECO must be copied in this. The following information must be documented:

- Time, date, location and nature of the incident;
- Corrective actions taken and by whom;
- Comments on the cause of the incident; and
- Signature.

The PM/ER in conjunction with the ECO will identify and approve remediation actions where necessary.

The Contractor must further also record any complaints (pertaining to environmental aspects) received from the affected parties (community, workforce, adjacent landowners, etc.) in a complaints register kept on-site (Refer to Annexure 7 for a sample). The lodged complaint must be brought to the attention of the PM/Engineer and the ECO must be copied in this. The PM/Engineer in consultation with/through the CR will respond accordingly. The following information will be recorded:

- Time and date of the complaint;
- Name and contact details of the lodger of complaint;
- Location and nature of the complaint;
- Corrective actions taken and by whom; and
- Signature.

An investigation must ensue and a response to the complainant must be provided within **seven working days**.

2.5 EMERGENCY PROCEDURES

The Contractor in consultation with the principle agent and design team must prepare emergency procedures in line with the Contractor's construction methodology and the design specifications that can be implemented immediately in the event of an emergency. Responsible staff must be trained in carry out these procedures and have access to the materials, equipment and appropriate personal protective equipment. The following emergency procedures should be addressed by the contractor as a minimum requirement:

- Use of hazardous substances and materials;
- Hydrocarbon and emergency spills;
- Contamination of water resources from spills;
- Contamination of soils from spills;
- Accidents to employees; and
- Fires.

The procedures need to include:

- Names of key emergency response personnel;
- Personnel responsibilities and contact details (including all-hours numbers);
- Contact details for emergency services;
- The location of on-site information on hazardous materials, including MSDS and spill containment material;

- Procedure to follow to minimise damage and control the emergency; and
- Instructions and contact details for notifying the Site Manager, principle agent, local council, and nearby residents if necessary.

2.6 SITE DOCUMENTATION

The following is list of documentation that must be held on site and must be made available to the ECO and/or Approving Authority on request.

- Access negotiations and physical access plan;
- Way leaves, letters of agreements, etc.;
- Incident reports and/or Environmental Incident Registers;
- Records of all remediation / rehabilitation activities;
- Copies of ECO reports (external management and monitoring);
- Copies of ESO reports (internal management and monitoring);
- A copy of Environmental Management Programme (EMPr);
- Complaints register;
- Awareness training material (toolbox talks, inductions, etc.);
- Service receipts and/or a Waste manifest; and
- Environmental Method statements.

2.7 PRO FORMA DOCUMENTATION

2.7.1 Prior to the commencement of construction activities

The following attached (Refer to Annexure 1 – 5) *pro forma* documentation is to be filled out and is binding to the EMPr and project contract and includes *inter alia*:

- Declaration of understanding by the Developer;
- Declaration of understanding by the Engineer;
- Declaration of understanding by the Contractor;
- Declaration of understanding by the Environmental Site Officer;
- Environmental Method statements; and
- ECO / Engineer approval for method statements.

2.7.2 During construction activities

The following documentation is to be maintained once filled out during the project period. These are binding to the EMPr and project contract. They include *inter alia*:

- Amended Environmental Method Statements;
- ECO / Engineer approval for amended method statements;
- Environmental incidents; and
- Records of all remediation / rehabilitation activities.

SECTION 3: ENVIRONMENTAL MANAGEMENT AND MITIGATION ACTIONS

3.1 PREAMBLE

The point of departure for this EMPr is to ensure a **pro-active rather than re-active** approach to environmental performance; by addressing potential problems before they occur. This will limit corrective measures needed during the construction phase of the project. Therefore, the purpose of an EMPr is to provide management measures that must be implemented by Developers, Engineers and Contractors alike to ensure that the potential impacts of a proposed development are minimised. It must also be ensured that the EMPr is maintained and upheld as a dynamic document in order for the project team to add or improve on issues that might be considered left out or not relevant to the project. In such instances, the ECO may make such changes subject to authorisation by the approving authority (See Section 1.6).

The following tables (see page 22-59) form the core mitigation measures appropriate to the **pre-construction, construction** and **operational phases**. The tables present the objectives to be achieved and the management actions that need to be implemented in order to mitigate the negative impacts and enhance the benefits of the project. Associated responsibilities, criteria/targets and required frequencies are clearly specified.

The '**pre-construction**' section of this EMPr, refers to the period of time leading up to and prior to the commencement of construction activities. This is to ensure pro-active environmental management measures with the goal of identifying avoidable environmental damage at the outset and sustain optimal environmental performance throughout the construction phase. Most impacts will occur during the construction phase and must be mitigated through the contingency plans identified during the pre-construction phase.

The "**construction**" section refers to all construction and its operation-related activities that will occur within the approved areas and access roads, until the project is completed. This "construction" section is divided into three functional areas, namely "materials"; "plant"; and "construction". Each of these functional areas within the EMPr contains specific mitigation requirements and requested contractor environmental method statements where required.

The bulk of environmental impacts will have immediate effect during the '**construction**' phase (e.g. noise, dust, and destruction of vegetation). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts prior to, or as they occur. These impacts will then be mitigated through the measures outlined in this section, together with a commitment to sound environmental management from the project team.

The "**operational**" section refers to the period from when construction is complete and operational activities are undertaken. In this EMPr, only select aspects could be predicted and it is strongly suggested that a dedicated Operational EMPr is generated closer to the operational phase, when a greater understanding of anticipated impacts, management bodies and management is available.

3.2 STRUCTURE AND CONTENTS OF TABLES

The table consists of seven parts as follows:

“Phase of development” - This row will identify either pre-construction (planning) or actual construction phase.

“Impact / issue” - This row will identify the issue being addressed, e.g. Materials, site demarcation, heritage, etc.

“Control/Mitigation Measure” - This column will include all the necessary mitigation measures for each impact/issue’.

“Management objectives” - This column will indicate what the management objectives to be achieved for each mitigation measure are.

“Measurable targets” - This column will indicate what evidence is to be used as an indication to whether or not the ‘Management objectives’ have been implemented and hence achieved.

“Frequency of action” - These columns provide time guidelines for the ‘Responsible party’ by which he/she is to action or manage the required mitigation.

3.3 SPECIALIST RECOMMENDATIONS

Anthrax Risk Assessment

It is pertinent to note that in the early 1900s, many areas in Gauteng were farmlands. Cattle and livestock would most certainly have been kept and some may well have succumbed to the 1923 anthrax outbreak. Construction projects have continued unabated and, to the best of the specialist’s knowledge, there have been no reported human cases of anthrax consequent to the many land development and construction activities that have occurred to date.

Furthermore extensive housing developments have taken place in Sandringham and Linksfield and these have not resulted in human cases of anthrax infection. The risk of exposure to anthrax, although relatively small, cannot be ignored. Infection Control strategies, under the guidance of an expert, could be employed to reduce the risk of human anthrax to negligible levels during the construction process. The recommendations made by the specialist should be taken into consideration.

Ecological Verification Assessment

The study area is situated within the Grassland Biome and within the Egoli Granite Grassland vegetation type which is also listed as an Endangered Ecosystem. Due to the small size of the study area as well as the level of transformation, only two vegetation communities namely transformed (old greens and fairways) and small pockets of Egoli Granite grassland were identified.

Although the species diversity was in general fairly low, more than 100 individuals of *Hypoxis hemerocallidea* (African Potato) which is nationally classified as “Declining” and on GDARD’s Orange List was identified within the study area and a permit should be obtained to relocate this species.

From a faunal perspective, the grassy areas attracted a few typical grassland bird species while the trees provided shelter, roosting and nesting habitat to many faunal species, especially birds. No wetland habitats were observed on site. No areas of high ecological sensitivity were found on the site. The majority of the study area was classified as medium-low sensitivity as the entire site was found to be degraded, all natural habitats altered and large populations of exotic species were present

throughout the area. Areas of low ecological sensitivity included roads, building rubble dumping sites as well as the old fairways.

Heritage Impact Assessment (HIA)

A Heritage Specialist undertook a Heritage Impact Assessment (HIA) for the greater Huddle Park area, of which a portion falls within the current proposed development. Key recommendations and management measures identified in the HIA have been included in the tables below under Specialist Requirements (Section E8).

Noise Impact Assessment (NIA)

The proposed Huddle Township Development is bordered on the South and East by Club Street; and on the North and West by the remainder of the existing Huddle Park Golf Course site. This site has two very different ambient noise regimes; The first regime is that close to the South and East boundary which is dominated by heavy and continuous traffic on Club Street, and the second the rest of the site which is bordered by open green spaces or suburban roads, and which has the characteristics of a quiet suburban environment.

The investigation's purpose was to assess the noise impact on the development of the existing ambient noise climate, and the development's impact on the surroundings. The impact of the development on the existing noise climate is assessed as NONE to VERY LOW both at daytime and night time.

The impact of the existing noise climate on the development is assessed as NONE at distances beyond 100m from Club Street to MODERATE at 40m from Club Street both at daytime and night time.

A continuous boundary wall or linked facade acting as a noise barrier along Club Street and the placement of the noisiest activities and noise insensitive land uses on this eastern boundary is recommended to achieve these conditions.

Social Impact Assessment (SIA)

The purpose of this Social Impact Assessment (SIA) is to provide information regarding the potential impacts that the proposed development may have on the social environment of the affected area. This SIA supports and provides critical input into the environmental application in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The aim of the SIA is to ensure that the social context is considered and potential impacts affecting the social environment are understood and assessed in order to ensure an informed decision is made by the Competent Authority (in this instance, the Gauteng Department of Agriculture and Rural Development (GDARD)) in terms of issuing an Environmental Authorisation for the proposed development.

Traffic Impact Assessment (TIA)

The traffic impact study evaluates the current traffic operating conditions of the key intersections surrounding the proposed development and the impact of the newly generated vehicles on these intersections. It also evaluates the access roads to/from the site and makes recommendations in this regard. Please refer to Section B4 for specific recommendations in terms of Traffic Impact Management.

Wetland Verification Delineation

From the verification exercise the wetland delineation by SEF and Imperata Consulting are accepted as accurate. The wetland has a low PES and EIS rating and the proposed Huddle Township Development should have little impact on the system if due diligence is paid during the different stages of development. Mitigation measures should focus on stormwater control, preventing water pollution, erosion and sedimentation. Please refer to the various management sections below for measures to be implemented.

PHASE OF DEVELOPMENT	PRE-CONSTRUCTION
IMPACT / ISSUE	GENERAL PLANNING
SECTION	A

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY
A1 PROJECT CONTRACT AND PROGRAMME			
i. The EMPr must be included as part of the tender documentation thereby making it part of the enquiry document to make the recommendations and constraints, as set out in this document, enforceable under the general conditions of contract. ii. A copy of this EMPr must be available on site. The Contractor must ensure that all the personnel on site, sub-contractors and their team, suppliers, etc. are familiar with and understand the specifications contained in the EMPr. iii. The “declarations of understanding” on the EMPr (Annexure 1 - 4) must be signed prior to the commencement of construction. Signed declarations of understanding must form part of site documentation.	<ul style="list-style-type: none"> Contingencies for minimising negative impacts anticipated to occur during the construction phase Ensure environmental awareness and formalise environmental responsibilities and implementation 	<ul style="list-style-type: none"> Contract records Signed declaration pro forma's 	<ul style="list-style-type: none"> Prior to construction during planning
A2 APPOINTMENTS AND DUTIES OF PROJECT TEAM			
i. The contact details for the ECO must be completed on the attached pro-forma and a copy kept on site. This document must be made available to the approving authority on request. ii. Before construction activities commence, role players must have a clear indication of to their role in the implementation of this EMPr as indicated in Section 2.1, Table 2. A DEO must be appointed by the principle contractor. iii. Subcontractor(s) contracts with the principle contractor must contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMPr.	<ul style="list-style-type: none"> Contingencies for minimising negative impacts anticipated to occur during the construction phase 	<ul style="list-style-type: none"> Contract records Signed declaration pro forma's 	<ul style="list-style-type: none"> Prior to construction during planning
A3 METHOD STATEMENTS			
i. As required in Section 2.3, certain method statements must be provided by the contractor. All activities which require method statements may only commence once the method statements have been approved by the PM/Engineer/ECO as applicable. ii. Where applicable, the contractor will provide job-specific training on an <i>ad hoc</i> basis when workers are engaged in activities, which require method statements.	<ul style="list-style-type: none"> Contingencies for minimising negative impacts anticipated to occur during the construction phase 	<ul style="list-style-type: none"> Approved method statements and relevant pro forma documents Training records 	<ul style="list-style-type: none"> As and when required

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY
A4 SITE DEMARCATION AND DEVELOPMENT			
<p>i. Should any signs or potential areas of Anthrax contaminated land be discovered, all work should be suspended until the appropriate specialist has evaluated the situation and cleared the area for work to reconvene.</p> <p>ii. The surveys for the overall project area and construction footprint must be complete and clearly demarcated and fenced before the contractors set up their crew camps or begin construction.</p> <p>iii. “No-go” areas such as sensitive areas identified during the specialist process, rocky outcrops, land not to be developed, topsoil stockpiles, etc. must be clearly demarcated (e.g. warning tape) and fenced (where possible) prior to the commencement of construction activities.</p> <p>iv. Construction camps, offices, workshops, staff accommodation and testing facilities should be established on the site in a manner that does not adversely affect the environment. These should be established outside the 1:00 year flood line and any drainage line. Before construction can begin, a site layout plan should be submitted to the engineer for approval. The site layout plan should detail the exact location, extent and construction details of these facilities and the impact mitigation measures the contractor proposes to put in place. In particular, this plan must include:-</p> <ul style="list-style-type: none"> • Site access (including entry and exit points). • Access points and haulage routes. • All material and equipment storage areas (including storage areas for hazardous substance such as fuel and chemicals) and laydown areas - Only designated areas may be used for the storage of materials, machinery, equipment, site offices and accommodation facilities. • Areas where construction vehicles will be serviced and washed. • Security requirements (including temporary and permanent fencing, and lighting) and accommodation areas for security staff. • The locality as well as the layout of the temporary waste storage facilities for litter, kitchen refuse, sewage and workshop-derived effluents. Waste storage facilities for sewage, grey water and workshop-derived effluents, where no formal facilities exist. • Provision of potable water and temporary ablution facilities. <p>v. The Contractor shall restrict all activities to the designated areas on the approved construction layout plan. Any relaxation or modification of the construction layout plan is to be approved by the ECO.</p>	<ul style="list-style-type: none"> • Contingencies for minimising negative impacts anticipated to occur during the construction phase 	<ul style="list-style-type: none"> • Demarcated area's • Filled in section of this document 	<ul style="list-style-type: none"> • As and when required

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY
A5 EMERGENCIES, NON-COMPLIANCE AND COMMUNICATION			
<p>i. The contractor must provide method statements on the protocols to be followed, and contingencies to be put in place (Emergency Response Plans – Section 2.5) for the following potential incidents before construction may begin:</p> <ul style="list-style-type: none"> • Contamination of natural water resources from spills; • Contamination of soils from spills; and • Fire. <p>ii. Communication in emergencies must follow the suggested lines of communication as stipulated Section 2.1, Figure 2.</p> <p>iii. The contractor understands that failure to adhere to the requirements of the EMPr will result in fines as stipulated in Section 4.1.1 'Tolerances', over and above the costs incurred for any remediation required as result of the specific non-compliance.</p>	<ul style="list-style-type: none"> • Contingencies for minimising negative impacts anticipated to occur during the construction phase 	<ul style="list-style-type: none"> • Method statements 	<ul style="list-style-type: none"> • As and when required

PHASE OF DEVELOPMENT	PRE-CONSTRUCTION
IMPACT / ISSUE	SPECIFIC PLANNING
SECTION	B

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
B1 AMBIENT NOISE LEVELS			
<ul style="list-style-type: none"> i. A boundary wall or linked façade acting as a noise barrier along the south and eastern boundaries of the development proposal should be considered for implementation. ii. Noise sensitive land-uses should not, if feasible be located on the South and Eastern boundaries, and should be reserved for less noise sensitive uses where deemed feasible. 	<ul style="list-style-type: none"> • To reduce the significance of the impact of existing ambient noise on the development proposal; and • To provide for the appropriate implementation of the mitigation measures pertaining to noise during the planning stages of the development proposal. 	<ul style="list-style-type: none"> • The noise abatement measures provided for by the acoustical engineer/environmental noise consultant dually considered and implemented during the planning phase. 	<ul style="list-style-type: none"> • When required/once off during the project planning stages
B2 OBSTRUCTIVE LIGHTING			
<ul style="list-style-type: none"> i. An electrical engineer should be consulted for the design and specification of lighting in terms of screening sources and low wattage lights. Provision should be made for the a design which incorporate the use of motion activated lights to limit obstructive lighting periods. ii. Provision should be made for the use of vertical light luminaire fitted with day-night switches when and if vertical structures or surfaces are lit. iii. Lighting design shall refrain from permanent lighting of outdoor spaces, in the event when light is only required intermittently. Provision should be made for systems with automatic switches, etc. 	<ul style="list-style-type: none"> • To reduce the significance of the anticipated adverse impact and associated nuisance experienced with obstructive lighting; and • To provide for the implementation of the mitigation/management measures which pertain to the aspect of obstructive lighting during the planning stages of the development proposal. 	<ul style="list-style-type: none"> • The mitigation and/or management measures specified dually considered and implemented during the planning phase. 	<ul style="list-style-type: none"> • When required/once off during the project planning stages

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
B3 CHANGE IN VISUAL CHARACTER			
<ul style="list-style-type: none"> i. A set of architectural, landscape and aesthetic guidelines shall be developed for the development proposal. ii. As many large indigenous trees shall be identified, retained and incorporated during the planning stage within the private open space areas of the development proposal. iii. Noteworthy exotic trees (large and visually attractive) shall be identified, retained and incorporated during the planning stage within the private open space areas for the development proposal. iv. Provision shall be made for the appropriate landscaping of parking areas. v. Provision shall be made in the Landscape Development Plan for large indigenous trees to retain the woodland character and current "sense of place". vi. Colour schemes for large buildings should be selected to break large surfaces. vii. Architectural and landscaping strategies should be adopted to create a pedestrian-scale environment along public routes. viii. An aesthetic committee should be set up to monitor/control and approve building plans. ix. Unsightly services such as air-conditioning ducts and satellite dishes should not be visible along public routes and streets. x. The backyards of buildings should not be visible from public places or should at least be visibly screened. xi. The perimeter of the development must be landscaped; maintained and existing trees must be retained, replaced or established to contribute to the public realm. xii. Where possible, matt paint must be utilised to reduce reflection. xiii. Roof material should not be silver or glossy (e.g. unpainted corrugated iron). xiv. Where direct views of the development occurs (along Edward Avenue and Margaret Rose Street), screening techniques such as earth berms and/or dense vegetation must be implemented. xv. All buildings, infrastructure and exterior spaces must be maintained. Damage must be repaired timeously and the structures must not be allowed to fall into a state of disrepair. xvi. Monitor all areas for rehabilitation failure and remediation techniques must be implemented immediately. 	<ul style="list-style-type: none"> • To provide for the reduction in significance of the anticipated impact of permanent change in visual character of the site for proposed development; and • To provide for the appropriate implementation of the mitigation and/or management measures which pertain to the anticipated change in visual character during the planning stages of the development proposal. 	<ul style="list-style-type: none"> • The mitigation and/or management measures specified dually considered and implemented during the planning phase. 	<ul style="list-style-type: none"> • When required/once off during the project planning stages

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
B4 IMPACT OF TRAFFIC ON THE ROAD NETWORK			
<p>i. A designated area within the confines of the development site should be created for the trucks and construction vehicles to park, so that they do not obstruct vehicles or pedestrians.</p> <p>ii. It is important that contractors are closely monitored to ensure that they keep to designated routes and that they obey the traffic laws and speed limits.</p> <p>iii. Construction vehicles should be clearly visible and drive with their headlights on at all times to increase visibility.</p> <p>iv. Traffic calming measures should be put in place to deter any unnecessary through-traffic through the surrounding neighbourhoods.</p> <p>v. The improvements to the road network must take place concurrent to construction. These improvements consist of the following:</p> <p>Club Street</p> <p>vi. An upgrade of Club street south of the development to a two lane per direction road from the Club Street/Linksfield Road/Civin intersection to a point 60m south of the Club Street/Huddle Park Golf Course access is proposed.</p> <p>Club Street/Civin Drive and Linksfield Road Intersection</p> <p>vii. North approach: 100m exclusive right turn lane, 2 through lanes and the exiting left turn slip lane, 100m short exit lane.</p> <p>viii. South approach: 3 through lanes, 2 exclusive right turn lanes (60m) and an exclusive left turn slip lane.</p> <p>ix. East approach; 3 through lanes, 2 exclusive right turn lanes and one left turn lane.</p> <p>x. Revised signal phasing.</p> <p>Civin Drive, Chaucer Avenue and St Christopher Drive</p> <p>xi. Signal optimisation is proposed to meet the high demand on the south approach;</p> <p>xii. A short 60m receiving lane is proposed on the north approach.</p> <p>xiii. An extension to 120m of the proposed short 60m accepting lane on the north approach is proposed to accommodate future traffic.</p>	<ul style="list-style-type: none"> • To reduce the significance of the anticipated impact of increased traffic on road network within in the vicinity of the development proposal; and • To provide for the consideration and implementation of the measures as per the traffic engineer input during the planning stages of the development proposal. 	<ul style="list-style-type: none"> • The measures of proposed by the traffic engineer dually considered and implemented. 	<ul style="list-style-type: none"> • When required/once off during the project planning stages

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
B4 IMPACT OF TRAFFIC ON THE ROAD NETWORK (CONTINUED...)			
<p>Club Street and St Andrews intersection xiv. A Traffic Signal is proposed at this intersection.</p> <p>Club Street and Huddle Park Golf Club Access xv. It is proposed to consolidate this intersection at the location of the entrance by providing a protected exit right turn lane with the four lane cross section at this location. Traffic will be able to exit under priority control because of the gaps created by the proposed St. Andrews/Club Street signalisation.</p> <p>Development accesses xvi. The developer will construct the Huddle Crescent public road with access onto Club Street at intersection 4 and 9 of the new proposed signalised intersection to the retail centre (intersection 8). All these intersections will require signalisation. xvii. A roundabout with a mountable internal circle 20m diameter and outer circle diameter of 28m is proposed for the northern residential access on Huddle Crescent. xviii. A stop control T-junction is proposed for the res. 3 and westernmost residential access off Huddle crescent (Intersection 10 and 12). xix. Three entrance lanes and two exit lanes are proposed for each of the security access controlled residential estate access points. The entrance stoplines should be at least 30m set back from the Huddle Crescent intersections and at least one of the lanes should be 4.m wide and 5m high to allow emergency vehicle access.</p>	<ul style="list-style-type: none"> • To reduce the significance of the anticipated impact of increased traffic on road network within in the vicinity of the development proposal; and • To provide for the consideration and implementation of the measures as per the traffic engineer input during the planning stages of the development proposal. 	<ul style="list-style-type: none"> • The measures of proposed by the traffic engineer dually considered and implemented. 	<ul style="list-style-type: none"> • When required/once off during the project planning stages

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
B5 HYDROLOGY			
<p>The following measures shall be considered and implemented during the planning phase to reduce the significance of the anticipated adverse environmental impact (to be associated with the development proposal) on the adjacent delineated watercourse:</p> <ul style="list-style-type: none"> i. The 32 m conservation buffer delineated for the watercourse on the adjacent site shall be implemented during the planning phase and dually considered by all relevant specialists (i.e. Town Planner, Landscape Architect, Architect etc.) (Except for the area where minimal encroachment into the buffer is proposed at the south-eastern corner of the site). The watercourse and associated buffer shall be designated as private/public open space. No development shall be scheduled to take place within the watercourse and the associated buffer zone. ii. Stormwater management control measures recommended by the consulting engineers should be incorporated within the proposed development. The following aspects as per the input of the wetland ecologist shall also be considered during the planning phase for implementation. iii. The retardation and containment of water on site in numerous structures that have permeable swales or walls to allow for slow but constant release of water into the downslope structures. iv. The stormwater management plan should be integrated with measures proposed for landscape design on site. v. The release of water from stormwater structures into down-slope structures that have been planned in conjunction with Huddle Park Golf Course. 	<ul style="list-style-type: none"> • To reduce the significance of the anticipated adverse impact to be associated with the development proposal on the adjacent delineated watercourse; and • To provide for the consideration and implementation of the mitigation/management measures specified for the delineated watercourse during the planning stages of the proposed development. 	<ul style="list-style-type: none"> • The mitigation and/or management measures specified dually considered and implemented during the planning phase. 	<ul style="list-style-type: none"> • When required/once off during the project planning stages

PHASE OF DEVELOPMENT	CONSTRUCTION
IMPACT / ISSUE	MATERIALS
SECTION	C

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
C1 STOCKPILES			
<p>i. The contractor must provide method statements for the “stockpiling” prior to construction taking place.</p> <p>ii. The stockpiles may only be placed within the demarcated areas the location of which must be approved by the ER or PM in consultation with the ECO.</p> <p>iii. No materials shall be stockpiled within the 1:50 and 1:100 year floodline on site, or in close proximity of the watercourse (wetland) adjacent to the site.</p> <p>iv. All stockpiled material must be easily accessible without any environmental damage. Construction activities will be planned in such that materials excavated from cuttings, in so far as possible, can be transported direct to and placed at the point where it is to be used.</p> <p>v. Temporarily stockpiled material must be stockpiled so that the spread of materials are minimised. Storm water run-off from all stockpile sites and other related areas must, where directed into the storm water system, be fitted with the necessary pollution prevention measures such as silt traps and may not run freely into the immediate and surrounding environments.</p> <p>vi. During the life of the stockpiles, the contractor shall that stockpiles are:</p> <ul style="list-style-type: none"> • Positioned and sloped to create the least visual impact; • Constructed and maintained so as to avoid erosion and contamination of surrounding environment. Stockpiles must be wetted down or vegetated to reduce dust fallout (as necessary); and • Kept free from all alien/undesirable vegetation. <p>vii. Soils from different horizons must be stock piled such that topsoil stockpiles or wetland soils do not get contaminated by sub-soil material.</p> <p>viii. Topsoil stockpiles must not be higher than 2 meters to avoid compaction.</p> <p>ix. Topsoil stockpiles must be monitored for invasive exotic vegetation growth. Contractors must remediate as and when required in consultation with the ECO.</p> <p>x. Topsoil stockpiles must be clearly demarcated as no-go areas and no plant, workforce or any construction activities may be allowed onto the topsoil stockpiles.</p>	<ul style="list-style-type: none"> • Minimise scaring of the soil surface and land features • Minimise disturbance and loss of soil • Minimise construction footprint • Minimise sedimentation of nearby drainage lines • Maintain the integrity of topsoil’s for landscaping and rehabilitation • Containment of invasive plant growth • Minimise contamination of storm water run-off 	<ul style="list-style-type: none"> • No visible erosion scars once construction is completed • The footprint has not exceeded the approved development site, etc. • Minimal invasive weed growth • No signs of sedimentation and erosion 	<ul style="list-style-type: none"> • Monitored daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
C2 CEMENT			
<ul style="list-style-type: none"> i. The contractors must provide and maintain a method statement for “cement and concrete batching” prior to construction taking place. The method statement must provide information on: <u>proposed storage, washing & disposal of cement, packaging, tools and plant.</u> ii. Cement containing run-off into soils, streams and natural vegetation must be avoided at all times. The mixing of concrete must be done at <u>specifically selected and designated sites</u> on mortar boards or concrete aprons (or similar structures) where applicable. iii. Proper cleaning trays must be implemented and utilised on site for the cleaning of cement mixing and handling equipment. Designated areas must be identified and suitably equipped towards the rinsing of ready-mix trucks’ chutes. iv. All empty containers must be stored in a dedicated area and later removed from the site for appropriate disposal at a licensed facility. Note that empty cement bags must be “washed” (wetted down) prior to disposal to ensure that all toxic dust reacts. v. Any spillage that may occur must be investigated and immediate remedial action must be taken. vi. The visible remains of concrete, either solid, or from washings, must be physically removed immediately and disposed of as waste to a registered landfill site. All excess aggregate shall also be removed. vii. Centralised cement batching areas must be located in consultation with the ER, PM or ECO to ensure that the proposed location does not fall within sensitive areas such as drainage lines, storm water channels, etc. Measures must be put in place to further ensure that residues are contained and will not enter drainage lines, storm water channels, etc. viii. All wastewater and runoff from batching areas shall be strictly controlled, and cement contaminated water shall be collected, stored and disposed of at a site approved by the ECO. ix. Suitable screening and containment shall be in place to prevent windblown contamination associated with bulk cement silos, loading and batching. x. Bulk cement silos and permanent batching areas should be equipped with bund walls in order to ensure that waste water and cement containing effluent is contained. 	<ul style="list-style-type: none"> • Minimise the possibility of cement residue entering into the surrounding environment • Minimise pollution of soil, surface and ground water resources 	<ul style="list-style-type: none"> • No evidence of contaminated soil on the construction site • No evidence of contaminated water resources • Method statement 	<ul style="list-style-type: none"> • Monitored daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
C3 OIL AND CHEMICALS			
<ul style="list-style-type: none"> i. The contractor must provide method statements for the “handling & storage of oils and chemicals” and “emergency spills procedures” prior to construction taking place. ii. These substances must be confined to specific and secured areas within the contractor’s camp, and in a way that does not pose a danger of pollution even during times of high rainfall. iii. Storage areas must be imperviously bunded with adequate containment (at least 1.5 times the volume of the fuel) for potential spills or leaks iv. Drip trays (minimum of 10cm deep) must be placed under all plant and vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised. v. The surface area of the drip trays will be dependent on the vehicle and must be large enough to catch any hydrocarbons that may leak from the vehicle while standing. vi. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle. vii. Emergency spill kits must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. Spill kits must be made up of material/product that is in line with environmental best practice (SUNSORB is a recommended product that is environmentally friendly). viii. All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site, (this includes contaminated soils, and drenched spill kit material). ix. All spilled material must be recorded in a spills register/incident register along with the date of occurrence and corrective action taken. 	<ul style="list-style-type: none"> • Prevention of pollution of the environment • Minimise chances of transgression of the acts controlling pollution 	<ul style="list-style-type: none"> • No pollution of the environment • No litigation due to transgression of pollution control acts • No complaints from I&APs • Method statements 	<ul style="list-style-type: none"> • Monitored daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
C4 DANGEROUS AND TOXIC MATERIALS (PROVISION OF STORAGE FACILITIES)			
<ul style="list-style-type: none"> i. The contractor must supply a method statement for the “storage of hazardous materials” at tender stage or prior to construction taking place. ii. Materials such as fuel, oil, paint, herbicide and insecticides shall not be stored or handled within the 1:50 and 1:100 year floodline or the watercourse on the adjacent site, or the 32 m conservation buffer delineated in respect of the aforementioned watercourse iii. Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas, on impermeable surfaces, under lock and key, in well-ventilated areas. iv. Storage areas must display the required safety signs depicting “No Smoking”, “No Naked lights” and “Danger”. Containers must be clearly marked to indicate contents as well as safety requirements. v. Material Safety Data Sheets (MSDS) must be available for all hazardous substances on site and sourced by the supplier where relevant. vi. Sufficient care must be taken when handling these materials to prevent pollution and the appropriate PPE should be worn at all times. Training on the handling of dangerous and toxic materials must be conducted for all staff prior to the commencement of construction. vii. In the case of pollution of any surface or groundwater, the ECO must immediately be informed in order to ensure that Regional Representative of the Department of Water Affairs (DWA) is notified accordingly. viii. All spilled material must be recorded in a spills register/incident register along with the date of occurrence and corrective action taken. 	<ul style="list-style-type: none"> • Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments • Minimise chances of transgression of the acts controlling pollution 	<ul style="list-style-type: none"> • No visible signs of pollution • No litigation due to transgression of pollution control acts 	<ul style="list-style-type: none"> • Monitor daily
C5 USE OF OILS AND CHEMICALS & DANGEROUS AND TOXIC MATERIALS			
<ul style="list-style-type: none"> i. The contractor must keep the necessary materials and equipment on site to deal with spills and fire of the materials present, should they occur. ii. When dangerous and toxic materials or oils and chemicals are to be used on site, they should be conveyed in drip trays and never placed/stored on bare soil. iii. The contractor must set up a procedure for dealing with spills/ fire, which will include notifying the ECO and the relevant authorities prior to commencing with construction. iv. All spilled material must be recorded in a spills register/incident register along with the date of occurrence and corrective action taken. 	<ul style="list-style-type: none"> • Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments • Minimise chances of transgression of the acts controlling pollution 	<ul style="list-style-type: none"> • No pollution of the environment • No litigation due to transgression of pollution control acts 	<ul style="list-style-type: none"> • As required

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
C6 BULK STORAGE OF FUELS AND OILS (IF APPLICABLE)			
<ul style="list-style-type: none"> i. The contractors must provide and maintain a method statement for “Diesel tanks and refuelling procedures” as well as “decommissioning of bulk fuel storage facilities” prior to construction taking place. ii. Bulk fuel storage tanks on the site must be on an impervious surface that is bunded and able to contain at least 110% of the total volume of the tanks/storage containers. The bund capacity and total storage volumes should be indicated on the bund facility. iii. The filler tap/ dispensing unit must be located inside the bunded area iv. The bund should be fitted with a drainage tap linked to an “oil-water separator” to facilitate servicing during periods of high precipitation or rupturing of the tank. v. A Certificate of Registration must be obtained for diesel or petrol (a closed-cap flash point of 38°C) volumes greater than 210 litres in accordance with the local municipal by-laws. vi. Bulk fuel storage tanks must be located in a portion of the construction camp where they do not pose a high risk in terms of water pollution (i.e. they must be located away from water courses). vii. Bulk fuel storage tanks must be placed so that they are out of the way of traffic, so that the risk of the tanks being ruptured or damaged by vehicles is minimised. viii. Bulk fuel storage areas should be covered during the rainy season by means of a corrugated iron roof or tarpaulin covers. ix. Tally sheets of all Diesel procured and used on site must be kept to ensure that theft/spills and evaporation is accounted for. 	<ul style="list-style-type: none"> • Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments • Minimise chances of transgression of the acts controlling pollution 	<ul style="list-style-type: none"> • No visible signs of pollution • No litigation due to transgression of pollution control acts • Method statement 	<ul style="list-style-type: none"> • Once off on inception; and • As required
<p>Note that Environmental Authorisation is required for volumes greater than 80 000 litres.</p>			

PHASE OF DEVELOPMENT	CONSTRUCTION
IMPACT / ISSUE	PLANT
SECTION	D

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D1 EATING AREAS AND CAMP FOLLOWERS			
<p>i. The contractors must provide and maintain a method statement for “Crew camps and construction lay down areas” prior to construction taking place.</p> <p>ii. The Contractor must, in conjunction with the ECO, designate restricted eating areas for eating during normal working hours (eating areas to conform to the requirements of the Occupational Health and Safety Act, Act 85 of 1993).</p> <p>iii. Water for human consumption should be available at the site offices and at other convenient locations on site (The use of raw water from the existing watercourse is strictly prohibited).</p> <p>iv. Adequate <u>closed</u> refuse bins must be provided and cleaned on a daily basis.</p> <p>v. The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited.</p> <p>vi. Should vectors (stray animals, flies, etc.) become problematic on site, the appropriate control measures must be implemented (such as environmentally friendly traps, contacting of animal control, etc.).</p> <p>vii. Litter (even if originating outside the camp) and empty concrete bags, etc. must be picked up daily and put into suitably closed bins.</p> <p>viii. No fires are to be lit without written authorisation by the landowner. Should permission be received, fires may not be constructed outside of specially equipped and designed facilities, with appropriate fire fighting measures in order to contain fires. The adequacy and positioning of these structures must be determined in consultation with the ECO.</p>	<ul style="list-style-type: none"> • Control potential influx of vermin and flies • Neat work place and hygienic environment • Minimise negative social impacts to local residents and businesses 	<ul style="list-style-type: none"> • No visual sign of vermin and flies • No complaints from I&APs 	<ul style="list-style-type: none"> • Once off on inception; and • Monitored daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D2 TOILETS AND ABLUTION FACILITIES			
<ul style="list-style-type: none"> i. The contractor is responsible for providing all sanitary arrangements for his and the sub-contractors team. A minimum of one chemical toilet must be provided per 15 persons. ii. The contractor must ensure that the staff is sensitised to the fact that they must use these toilets at all times. iii. Sanitary arrangements must be to the satisfaction of the ECO and the local authority. Toilets must be of the chemical type or flush-toilets connected to the municipal sewer system. The contractor must keep the toilets in a clean, neat and hygienic condition. The contractor must supply toilet paper at all toilets at all times. iv. The appropriate permits for sanitation facilities must be obtained from the local authorities. v. No effluent which emanates from temporary ablution facilities shall be allowed to contaminate surface water run-off on site. Effluent shall be properly contained on site, or disposed of in the local authority's sewer subject to approval being granted. vi. No effluent generated on site shall be allowed to drain within the lower laying watercourse (wetland) on the adjacent site; vii. The contractor (who must use reputable toilet-servicing company) must be responsible for the cleaning, maintenance and servicing of the toilets. The contractor (using reputable toilet-servicing company) must ensure that all toilets are cleaned and emptied before the builders' or other public holidays. viii. Ablutions must be easily accessible (within 100m of any point of work) and there should be a minimum of 1 toilet per 15-30 persons. The toilets must be sited more than 50m away from stormwater drainage lines and water resources. ix. Toilets out on site must be secured to the ground and have a sufficient locking mechanism operational at all times. x. Toilets must not be the cause of visual impact and shade net should be erected around toilets where these are visible to the general public. 	<ul style="list-style-type: none"> • Ensure proper sanitation is achieved which will encourage the workforce to utilise toilets provided and not the surrounding habitat • Minimise potential of diseases on site • Minimise potential to pollute soils, water resources and natural habitats 	<ul style="list-style-type: none"> • Workforce use toilets provided • No complaints received from I&APs as well as members of the workforce • No visible or measurable signs pollution of the environment (soils, ground and surface water) 	<ul style="list-style-type: none"> • As and when required

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D3 WASTE MANAGEMENT			
<p><i>For the purposes of these Environmental Specifications, solid waste includes all debris and waste (e.g. litter, food waste, wire and cable pieces, vegetation and tree stumps, building rubble, etc), including hazardous waste.</i></p> <ol style="list-style-type: none"> i. The contractors must provide and maintain a method statement for “solid waste management” prior to construction taking place. The method statement must provide information on proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes. ii. The principle contractor shall appoint a suitable independent entity to prepare a site specific Waste Management Plan (WMP) for implementation to give effect to the sustainable and integrated management of waste items on site with the main objective to increase efficiency and reduce the probability of potential adverse environmental impacts to be associated with the management of the said waste. iii. Waste management should occur in line with the National Waste Management Strategy and the Waste Hierarchy which is: <ol style="list-style-type: none"> a. Waste avoidance and reduction; b. Recovery, Reuse and Recycling; c. Treatment; d. Disposal; and e. Remediation. iv. Waste items must be classified at source according to a formal classification system (as outlined in the WMP) and separated into recyclable and non-recyclable waste. Waste items shall as a minimum be separated as follows: <ol style="list-style-type: none"> a. Hazardous waste: including (but not limited to) old oil, paint, etc, b. General waste: including (but not limited to) construction rubble, c. Reusable construction material. d. Recyclable waste must preferably be deposited in separate bins. v. All personnel shall be instructed to dispose of all waste in the proper manner (point ii and iii above and as captured in the WMP). This should be conveyed through toolbox talks. vi. Any illegal dumping of waste or littering must not be tolerated, this action will result in a fine and if required further legal action will be taken and proof of legal dumping must be able to be produced on request. vii. Safe Disposal Certificated (SDC) shall be provided in respect of all waste removed from site. 	<ul style="list-style-type: none"> • Sustainable management of waste by recycling • To keep the site neat and tidy • Minimise litigation and complaints by I&APs • Reduce visual impact • Control potential influx of vermin and flies thereby minimising the potential of diseases on site and the surrounding environment • Minimise potential to pollute soils, water resources and natural habitats 	<ul style="list-style-type: none"> • Disposal of rubble and refuse in an appropriate manner with no rubble and refuse lying on site • Site is neat and tidy • No complaints from surrounding residents and businesses • Sufficient containers available on site • No visible or measurable signs of pollution of the environment (soils, ground and surface water) • Method statement 	<ul style="list-style-type: none"> • Daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D3 WASTE MANAGEMENT (CONTINUED...)			
<p>viii. Solid waste shall be stored in a designated area within the site area in covered, tip proof metal drums for collection and disposal (a waste skip with a tarpaulin covered may also be used). As far as possible, general waste (including paper, glass, plastics, aluminium, etc.) shall be sorted for recycling.</p> <p>ix. Bins must be clearly marked for ease of management.</p> <p>x. The contractor must be in apposition to provide proof of any and all recyclable materials and waste collected for recycling or removed and deposited of at a licensed landfill site.</p> <p>xi. A specific designated area shall be established on site for the storage of general and hazardous waste items. The designated area shall not be located within any sensitive areas onsite including watercourses and the 1:50 and 1:100 year floodline on site. Provision shall be made for sufficient bins for the storage of general and hazardous waste items. The bins should where feasible be marked (as per waste classification system) to indicate the allowed waste item to be temporary stored on site.</p> <p>xii. All general waste items shall be temporarily stored in a manner which conforms to the general requirements for the storage of waste/general waste as per Section 21 and 22 of NEMWA. Specific requirements include:</p> <ul style="list-style-type: none"> o Containers in which any waste is stored should be intact and not corroded or in any other way rendered unfit for the safe storage of waste; o Adequate/sufficient measures should be taken to prevent accidental spills or leaks; o Waste should be stored in a manner where by it will not be blown away by strong winds; o Waste should be stored in a manner to ensure that nuisances such as odour, nuisances, visual impact and breeding of vectors do not occur/arise; and o Waste should be stored in a manner to ensure that pollution of the environment and harm to health are prevented. <p>xiii. The contractor is responsible for cleaning the contractor's camp and construction site of all structures, equipment, residual litter and building materials at the end of the construction period.</p> <p>xiv. The contractor should take cognisance and adhere to the general duty of care in respect of waste management as per Section 16 of NEMWA, 2008.</p>	<ul style="list-style-type: none"> • Sustainable management of waste by recycling • To keep the site neat and tidy • Minimise litigation and complaints by I&APs • Reduce visual impact • Control potential influx of vermin and flies thereby minimising the potential of diseases on site and the surrounding environment • Minimise potential to pollute soils, water resources and natural habitats 	<ul style="list-style-type: none"> • Disposal of rubble and refuse in an appropriate manner with no rubble and refuse lying on site • Site is neat and tidy • No complaints from surrounding residents and businesses • Sufficient containers available on site • No visible or measurable signs of pollution of the environment (soils, ground and surface water) • Method statement 	<ul style="list-style-type: none"> • Daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D4 DUST			
<p>i. The contractors must provide and maintain a method statement for “dust control” prior to construction taking place. The method statement must provide information on the proposed source of water to be utilised and the details of the licenses acquired for such usage.</p> <p>ii. The construction camp must be watered during dry and windy conditions to control dust fallout.</p> <p>iii. <u>As far as possible, potable water must not be used as a means of dust suppression</u>, and alternative measures must be sourced. The use of ‘grey’, ‘brown’ or raw water must be investigated as an alternative. The contractor will be responsible to source this water and obtain the required approvals to utilise this water for the purpose of dust suppression.</p> <p>iv. Dust production must be controlled by regular watering of roads and works area, should the need arise. (NB: Concrete dust is toxic and damages soil properties. Therefore watering to prevent dust spread must not be done where concrete dust has fallen or it will infiltrate into the soil. Concrete bags must not be allowed to blow around the site and spread cement dust).</p> <p>v. When it is deemed that the standard dust suppression measures are not sufficient or if complaints are received, main access roads and site camps must be surfaced with a temporary surface such as gravel to assist with dust suppression.</p> <p>vi. All vehicles transporting material that can be blown off (e.g. soil, rubble etc.) must be covered with a tarpaulin, and speed limits of 20 km/h must be adhered to.</p> <p>vii. Excessive dust conditions must be reported to the ECO.</p> <p>viii. Should excessive dust fallout be noted on site, regular monitoring of dust fallout must then be carried out and the records kept on site.</p> <p>ix. All forms of dust pollution must be managed in terms of the National Environmental Management: Air Quality Act (Act no. 39 of 2004) [NEM:AQA].</p> <p>x. All forms of dust pollution must be managed in terms of the National Environmental Management: Air Quality Act No. 39 of 2004). The contractor should take cognisance of an adhere to the maximum dust fall rates provided for various districts as per SANS 1929:2011- National Ambient Air Quality, Limits for common pollutants and the Draft National Dust Control Regulations (Notice 309 of 2011) promulgated in terms of NEMAQA, 2004.</p>	<ul style="list-style-type: none"> • Reduce dust fall out • Reduce visual impact • Minimise loss of valuable soil material 	<ul style="list-style-type: none"> • No visible signs of dust • No complaints from interested and Affected parties • No incidences reported to ECO • No visible evidence of dust contamination on the surrounding environment • Method statement • Targets not exceeded during monitoring of dust counts (when taking place) 	<ul style="list-style-type: none"> • Monitored daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D5 WORKSHOP EQUIPMENT, MAINTENANCE AND STORAGE			
<p><i>Refer to Section C3 – C5 for all management measures related to storage, handling and use of dangerous or toxic materials as well as oils and petrochemicals.</i></p> <p>i. The contractors must provide and maintain a method statement for “workshop maintenance and cleaning of plant” prior to construction taking place.</p> <p>ii. All maintenance and washing of vehicles and equipment must take place in the workshop area that is equipped with a bund wall and grease trap oil separator. During emergency servicing of vehicles or equipment, a suitable drip tray must be used to prevent spills onto the soil, especially where emergency repairs are done outside the workshop area.</p> <p>iii. Equipment must be inspected regularly for serviceability. All leaking equipment must be repaired immediately or be removed from site to facilitate repair. All potentially hazardous and non-degradable waste must be collected and removed to a registered waste site.</p> <p>iv. Workshop areas must be monitored for oil and fuel spills and such spills must be cleaned and remediated to the satisfaction of the PM, ER or ECO. Cleaning and remediation must be done with products that are in line with best environmental practice i.e. SUNSORB.</p> <p>v. The Contractor must be in possession of an <u>emergency spill kit</u> that is complete and <u>available at all times</u> on site. The Contractor must ensure that senior and other relevant members of the workforce are trained in dealing with spills by using emergency spill kits.</p> <p>vi. The following must be applied:</p> <ul style="list-style-type: none"> ○ All contaminated soil / yard stone shall be removed and disposed of as hazardous waste at a registered facility. ○ Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding bin and sent back to the supplier, a recycling centre or to a registered hazardous waste facility. ○ All used filter materials shall be stored in a secure bin for disposal off site. ○ Any contaminated soil shall be removed and replaced. ○ All spills of hazardous substances must be reported to the ECO. ○ The contractor must comply with the regulations of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993). 	<ul style="list-style-type: none"> • Prevent pollution of the environment • Minimise chance of transgression of the acts controlling pollution • Disposal of hazardous substances in an appropriate manner 	<ul style="list-style-type: none"> • No pollution of the environment • No litigation due to transgression of pollution control acts • Method statement 	<ul style="list-style-type: none"> • Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D6 NOISE			
<ul style="list-style-type: none"> i. As per the noise specialist's recommendations, a boundary wall or linked façade acting as a noise barrier should be erected along the south and eastern boundaries. ii. In terms of noise impact for various increases over the ambient, the National Noise Regulations define an increase of 7dB as "disturbing". Noise levels during construction must therefore be kept as low as possible and compliance with the appropriate legislation with respect to noise is mandatory. iii. Refer to the Noise Impact Assessment and implement noise reduction and screening to limit exposure. iv. Work hours during (06:00 – 18:00 during weekdays; 08:00 – 17:00 on Saturdays; and no work on Sundays and Public Holidays) the construction phase must be strictly enforced unless permission is otherwise granted. Permission must be sought from the municipality, local residents and businesses for any work outside of the stipulated working hours. v. Exceptionally noisy activities must be undertaken in normal working hours, outside of school hours. vi. All construction vehicles must be in a good working order to reduce possible noise pollution. vii. All noise-making equipment shall be turned off when not in use. viii. All construction vehicles must abide by speed limits and should not exceed speed limits of 40km/ hour to reduce their potential to contribute to the already high traffic noise. ix. Noise reduction is essential and Contractors must endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc. x. The CLO (CR) or DEO must inform the residents of houses and businesses adjacent to the development in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the adjacent sites. These activities could include, but are not limited to, blasting, piling, use of pneumatic jack-hammers and compressors, etc. xi. Should excessive complaints be received, monitoring of noise levels must be conducted regularly during construction and the records kept on site. Appropriate noise reduction measures in consultation with a specialist to be implemented. 	<ul style="list-style-type: none"> • Maintain noise levels below "disturbing" as defined in the National Noise Regulations • Minimise the nuisance factor of the development 	<ul style="list-style-type: none"> • No complaints from surrounding landowners or I&APs 	<ul style="list-style-type: none"> • As and when required

PHASE OF DEVELOPMENT	CONSTRUCTION
IMPACT / ISSUE	CONSTRUCTION
SECTION	E

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E1 CREW CAMPS			
<ul style="list-style-type: none"> i. The contractors must provide and maintain a method statement for “Crew camps and construction lay down areas” prior to construction taking place. ii. The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the National Building Regulations. iii. Only security personnel will be allowed to sleep over on site. Accommodation for members of the workforce is not permitted on site unless authorisation has been given by the Landowner and Proponent in consultation with the ECO. iv. Dedicated wash areas must be situated away from watercourses and areas of shallow groundwater. v. Dust suppression must be applied at the contractor’s camp as required. This may include the laying of gravel. The use of grey water can be considered as an option if the required permits have been acquired. vi. The contractor’s camp, offices and storage facilities must be located within the site boundaries. No person must be allowed to stay on neighbouring sites, unless it is cleared with the owner. In such an event, all requirements of the EMPr will apply. vii. The contractor must provide labourers plastic bags to clean up the contractor’s camp and construction site on a daily basis. These areas must then be inspected by the contractor or his/her DEO to ensure compliance with this requirement. viii. The contractor is responsible for cleaning the contractor’s camp and construction site of all structures, equipment, residual litter and building materials at the end of the construction period and topsoil restored in areas where landscaping is to take place. 	<ul style="list-style-type: none"> • Minimise water pollution • Minimise dust fallout • Minimise unwarranted environmental damage outside the footprint • Maintain a clean and healthy working environment • Minimise impact to surrounding environment 	<ul style="list-style-type: none"> • No signs of water or soil pollution • No complaints from surrounding landowners or I&APs • No visible signs of litter • Method statements 	<ul style="list-style-type: none"> • Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E2 COMMUNITY RELATIONS			
<p>i. Information boards should be erected and maintained in the position, quantity, design and dimensions specified. Such boards shall include contact details for complaints by members of the public.</p> <p>ii. A Complaints Register shall be kept on site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself. Copies of all entries into the complaints register should be kept in the environmental site file.</p> <p>iii. A forum should be established between the community and the developers to facilitate the discussions to take the project forward in a mutually beneficial way.</p> <p>Employment</p> <p>iv. Without compromising construction and operation activities and schedules, local labour should be employed as far as possible.</p> <p>v. Those successful in obtaining employment should be provided with the appropriate skills development and training.</p> <p>Local Labour Recruitment and Employment Strategy</p> <p>vi. The project should involve all affected communities to ensure full participation in the project.</p> <p>Appointment of Community Liaison Officer (CLO)</p> <p>vii. The CLO will be on the ground and basically do the day-to-day and week-to-week monitoring of labour in conjunction with the Site Agent and the Contractor.</p>	<ul style="list-style-type: none"> • Keep all adjacent landowners and general public informed. • Provide opportunities for the local general public. 	<ul style="list-style-type: none"> • No complaints from adjacent landowners or general public. 	<ul style="list-style-type: none"> • As and when required.
E3 FIRES			
<p>i. The contractors must, prior to construction taking place, provide and maintain a method statement for “fires”, clearly indicating where and for what fires will be utilised plus details on the fuel to be utilised</p> <p>ii. Absolutely no burning of waste is permitted.</p> <p>iii. Fires will only be allowed in facilities especially constructed for this purpose within fenced Contractor’s camps.</p> <p>iv. There should be basic fire fighting equipment available on site at all times. This shall include at least rubber beaters and one fire extinguisher.</p> <p>v. No wood or any other material is to be collected, chopped or felled for fires from private or public property as well as from no-go or sensitive areas within the site and any surrounding natural vegetation. Wood, charcoal or anthracite are the <u>only fuels permitted</u> to be used for fires.</p>	<ul style="list-style-type: none"> • Minimise risk of veldt fires • Minimise destruction of natural fauna and flora • Maintain safety on site 	<ul style="list-style-type: none"> • No veldt fires started by the contractor’s workforce • No claims from landowners for damages due to veldt fires • Method statement 	<ul style="list-style-type: none"> • Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E3 EROSION AND SEDIMENTATION			
<p>i. All slopes that are disturbed during construction may result in slope instability and erosion by rain and surface run-off and must immediately be stabilised to prevent erosion. Where re-vegetation of slopes is undertaken, this must be done in accordance with the landscape architect (or appointed landscaper).</p> <p>ii. To reduce the loss of material by erosion, the contractor must ensure that disturbance on site is kept to a minimum. The contractor is responsible for rehabilitating all eroded areas in such a way that the erosion potential is minimised after construction has been completed.</p> <p>iii. Areas prone to erosion should be monitored and the necessary mitigation measures such as sand bags, earth berms, soil saver blankets and temporary vegetation should be initiated on site if necessary.</p> <p>iv. These areas must be cordoned off so that vehicles or construction personnel cannot gain access to these areas.</p> <p>v. Where erosion and/or sedimentation occurs on or off the site (despite the Contractor complying with the foregoing), rectification shall be carried out in accordance with details specified by the Engineer.</p>	<ul style="list-style-type: none"> • Minimise erosion damage • Minimise impeding the natural flow of water • Minimise scarring of the soil surface and land features • Minimise disturbance and loss of topsoil • Re-growth of disturbed areas 	<ul style="list-style-type: none"> • No erosion scars • No loss of topsoil • No interference with the natural flow of water • No visible erosion scars once construction is completed • The footprint has not exceeded the agreed boundaries • All damaged areas successfully rehabilitated 	<ul style="list-style-type: none"> • As and when required
E4 NO-GO / SENSITIVE AREAS			
<p>i. The construction footprint must be kept to a minimum must be clearly demarcated (e.g. warning tape) and fenced prior to the commencement of construction activities, thus reducing the infringement of the development on surrounding habitats.</p> <p>ii. All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction.</p> <p>iii. No-go areas must be demarcated with fencing/warning tape and these areas and the type of fencing/demarcation must be approved by the ECO.</p> <p>iv. No construction activities may take place in No-go areas.</p>	<ul style="list-style-type: none"> • Minimise the potential for the spread of the of the construction footprint • Reduce loss of fauna and flora habitat • Minimise the potential for loss of protected and or endangered fauna and flora species 	<ul style="list-style-type: none"> • No sign of movement through “no go” areas. • Containment of footprint 	<ul style="list-style-type: none"> • Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E5 FAUNA			
<ul style="list-style-type: none"> i. All activities on site must comply with the regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962). ii. The development footprint area should be demarcated prior to the commencement of construction activities. The area should be fenced with a type of fence which will provide faunal species the opportunity to move away from the area as activities progress in nature and extent on site. iii. The construction site must be fenced in such a way so as to prevent vehicular and pedestrian access to the surrounding open space areas. iv. All construction workers must be informed that the intentional killing of any animal is not permitted as faunal species are a benefit to society. This topic should be covered during inductions and toolbox talks with proof presented on request. v. Environmental induction training and awareness must include aspects dealing in safety with wild animals into and on site. Focus on animals such as snakes and other reptiles that often generate fear by telling workers how to move safely away and to whom to report the sighting. Workers should also be informed where snakes most often hide so that they can be vigilant when lifting stones, etc. vi. In the case of a problem animal e.g. a large snake, a specialist must be called in to safely relocate the animal if the ESO or ECO is not able to. vii. Poaching, trapping, poisoning and/or shooting of animals is strictly forbidden and it must be a condition of employment that any employee caught poaching will be dismissed. viii. No domestic pets or livestock, except for the trained animals, will be permitted on site during the construction period. ix. The use of herbicides and pesticides must be avoided wherever possible. x. Construction should take place in the winter months (where practical) to minimise disturbance to breeding fauna in the surrounding natural area. xi. No wild animal may be fed on site. 	<ul style="list-style-type: none"> • Minimise disturbance to animals • Minimise interruption of breeding patterns of birds • Minimise destruction of habitat 	<ul style="list-style-type: none"> • No complaints from Nature Conservation • No litigation concerning applicable animal protection acts • No measurable or visible signs of habitat destruction 	<ul style="list-style-type: none"> • Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E6 FLORA			
<p>i. A large number of <i>Hypoxis hemerocallidae</i> (African Potato) species has been identified by a terrestrial ecologist. It is as per the recommendations for the Ecological Verification Study that all species be identified prior to construction and relocated to a suitable conservation area.</p> <p>ii. All permits and/or relevant other authorisations in relation to the relocation of the <i>Hypoxis hemerocallidae</i> species shall be in order prior to construction activities on site.</p> <p>iii. All <i>Hypoxis hemerocallidae</i> species shall be identified by a suitably qualified botanist prior to construction and relocated to a suitable conservation area. All actions shall be performed prior to construction activities on site.</p> <p>iv. Trees and natural vegetation or any other natural features outside the work area, which will not be cleared for construction purposes, must be clearly demarcated and not be defaced, removed, painted for benchmarks or otherwise damaged, even for survey purposes. Any feature defaced by the contractor must be reinstated to the satisfaction of the ECO and penalties / fines may be imposed by the ER.</p> <p>v. Existing indigenous vegetation should be incorporated into the development landscape as far as possible.</p> <p>vi. No open fires shall be allowed on site under any circumstances, fires will only be permitted in adequate facility within the crew camp, Forest Act, 1984 (Act No. 122 of 1984).</p> <p>vii. Surrounding open space areas and areas outside the footprint of the construction area should not be disturbed, to uphold the integrity of existing flora and minimise the opportunity of invasion by alien vegetation.</p> <p>viii. All large indigenous trees to be retained with in the private open space areas, should be clearly demarcated prior to construction and adequately protected from construction and associated/related activities.</p> <p>ix. All areas affected by construction should be rehabilitated upon completion of the construction phase of the development. Areas should be reseeded with indigenous grasses as required.</p> <p>x. Vegetation should be removed only where required, other areas are to be left intact to allow these areas to act as source areas for the re-establishment of species to disturbed areas, over time.</p>	<ul style="list-style-type: none"> • Minimal disturbance to vegetation where such vegetation does not interfere with construction in terms of approvals from the relevant authority; • Minimise scarring of the soil surface and land features; • Minimise disturbance and loss of topsoil • Minimise risk of veldt fires; • Minimise the risk for contamination surface water on site; • Minimise the risk for the contamination of the watercourse delineated; • Minimise risk of the alteration to and/or destruction of flora and fauna habitat; • Minimise the risk for the degradation of aquatic floral and faunal habitat. 	<ul style="list-style-type: none"> • No litigation due to removal of vegetation without necessary permission; • No exotic plants used for landscaping; • No visible erosion scars once construction is completed; • The activity footprint has not exceeded the agreed boundaries; • No veldt fires as a result of actions of contractor/sub-contractor work force; • No claims from landowners for damages due to veldt fires; • No eminent contamination of the watercourse delineated; • No disturbance to and the associated degradation of aquatic habitat; and • No visible disturbance to trees and vegetation within the surrounding open space areas. 	<ul style="list-style-type: none"> • As and when required

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E6 FLORA (CONTINUED...)			
<ul style="list-style-type: none"> xi. Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the proposed development activities. xii. No contaminated water and/or effluent shall contaminate surface water runoff on site and/or flow freely into the adjacent watercourse. xiii. Construction workers may not tamper or remove natural vegetation from the surrounding areas and neither may anyone collect seed from the plants without permission from the open space/environmental and/or conservation unit of the local and/or competent authority. xiv. Connectivity with any corridors to surrounding natural areas must be maintained and protected; corridors must be demarcated as no-go areas. xv. Locally indigenous plants must be used during landscaping and rehabilitation of the site. xvi. Plants that are proclaimed as problem plants, noxious weeds or declared invaders must be removed immediately. These plants, as well as any other problem plants must be continually eradicated prior to going into seed. 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above
E7 ACCESS ROUTE/HAUL ROADS			
<ul style="list-style-type: none"> i. No unauthorised access roads are permitted to the construction area. Any authorised clearing for access roads must be done under the supervision of the ECO. ii. Any damaged or degradation will be investigated and fines issued, the affected areas must be immediately rehabilitated. iii. Where possible, existing roads should be used as access roads. iv. Access roads for earthmoving-equipment must be clearly designated and be positioned as close as possible to the proposed development site. v. No driving off from the marked roads is permitted. vi. Designated parking areas must be identified and the use of these areas strictly enforced. vii. Neither the site nor its access roads must be allowed to be utilised for recreational activities, this includes but is not limited to quad bikes, 4x4's and dirt bikes. Security personnel must be informed and ensure that this is enforced. 	<ul style="list-style-type: none"> • Minimise loss of topsoil and enhancement of erosion • Minimise fauna and flora displacement by destruction of natural habitats 	<ul style="list-style-type: none"> • No erosion on access roads after completion of construction • No loss of topsoil due to run-off water on access roads 	<ul style="list-style-type: none"> • As required, monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E8 HERITAGE			
<ul style="list-style-type: none"> i. In terms of the National Heritage Act, 1999 (Act No. 25 of 1999), construction personnel must be alert and must inform the local heritage agency should they come across any findings of heritage resources, other than those already identified, within 24 hours. ii. Should any archaeological artefacts be exposed during construction activities, work on the area where the artefacts were found must cease immediately and the ECO must be notified within 24 hours. iii. Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist. iv. Under no circumstances must archaeological artefacts be removed, destroyed or interfered. v. Any archaeological sites exposed during demolition or construction activities must not be disturbed prior to authorisation by the South African Heritage Resources Agency (SAHRA) or the appropriate Provincial Heritage Resource Agency of Gauteng (PHRAG). vi. The heritage features identified (Clubhouse, Caddies/Pro shop, Caddies compound, ticket office, stores, sub-station, furrow and dam) outside of the extent of the site may in no way be disturbed and/or permanently altered due to the development. 	<ul style="list-style-type: none"> • Limit the destruction of the country's heritage resources • The preservation and appropriate management of new archaeological finds should these be discovered during construction • Conform to the requirements of specialist studies in terms of heritage features identified and located outside of the extent of the site for proposed development 	<ul style="list-style-type: none"> • No destruction of or damage to known archaeological sites 	<ul style="list-style-type: none"> • Monitor Daily
E9 GEOTECHNICAL			
<ul style="list-style-type: none"> i. Founding conditions for individual structures must be confirmed by a qualified Geotechnical Engineer / Structural Engineer / Geologist. ii. All trenches and excavation works must be properly backfilled and compacted according to specifications given in sub-clause 5.2.4. Of SANS 1200DA. iii. Mechanical methods of rock breaking will have noise and dust impacts that must be managed. iv. Method Statements for chemical breaking must be provided by the CE/ER. 	<ul style="list-style-type: none"> • Minimise potential structural faults • Minimise trench collapse 	<ul style="list-style-type: none"> • No visible signs of backfill deterioration or trench collapse 	<ul style="list-style-type: none"> • As and when required

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E10 CRIME, SAFETY AND SECURITY			
<ul style="list-style-type: none"> i. The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the National Building Regulations. ii. Security personnel should be on site on a permanent basis and prominent on site. iii. No site staff, other than security personnel and skeleton staff will be housed on site. Security personnel and skeleton staff must be supplied with adequate protective clothing, ablution facilities, water and refuse collection facilities, facilities for cooking and heating so that <u>open fires are not necessary</u>. iv. The construction area must be secured by means of a boundary/ perimeter fence. This will serve to prevent public access to the site, for public safety and for security reasons (theft). v. Access to the site must be controlled so as to restrict unauthorised personnel from entering the site and adequate signage of the dangers associated with construction activities displayed. vi. The workers on site must retain some means of identification. The ESO and the contractor are responsible for ensuring that only authorised personnel are on site at all times. vii. Workers may not leave the designated construction areas without permission. viii. Community patrolling and the use of existing initiatives to curb crime used by the community should be supported by the developer. ix. The contractor shall furnish all site workers and/or personnel with the necessary PPE to reduce the probability of hazards to health and safety on site, and to mitigate the effects should such hazards occur. x. The contractor must ensure that all emergency procedures/method statements are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of the ground, accidents to employees, use of hazardous substances and materials, etc. xi. The contractor must ensure that lists of all emergency telephone numbers and contact persons are kept up to date. All numbers and names are to be posted at relevant locations throughout the construction site. xii. The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. 	<ul style="list-style-type: none"> • Reduce the risk of potential incidences • Minimise the potential impact on the environment • Appropriately mitigate the effects of hazards to health and safety in the event that it is realised 	<ul style="list-style-type: none"> • No incidences reported 	<ul style="list-style-type: none"> • Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E11 VISUAL IMPACT			
<ul style="list-style-type: none"> i. The screening capacity of the site shall be improved by the erection of material to screen the site and construction site camp(s). Green or Khaki brown shade cloth (at least 20% density) should be used as a barrier screen (at least 3m high). ii. The colours of all permanent structures shall be chosen so as to blend in with the dominant colours of the surrounding landscape. iii. The flow and continuity between the existing and proposed new residential areas should be maintained as far as possible. iv. The design of entrances to the development, houses, apartments and the nature of boundary walls should be kept in line with the character of the residential area which borders the development site. v. Shade cloth must be utilised to conceal and minimise the visual impact of contractor camps, lay down and storage areas as identified by the ECO. vi. The construction site camps shall be kept neat, clean and organised in order to portray a tidy appearance and sound housekeeping principles shall be applied. vii. Rubble and litter must be removed from site as often as the need arises (but at least every two weeks) and disposed at a registered landfill site. Areas where refuse is stored areas should be out of sight from the road. viii. Removal of rubble and all construction waste items from site, or provide for the temporary storage thereof in weather proof bins to keep the site and construction site camps free of uncontained waste and litter. ix. Where deemed possible, construction camps shall be located in areas that area in a disturbed state or earmarked for development, thus limiting the removal of established vegetation. x. Existing vegetation and trees on site to be retained through the application of selective clearing. xi. Identified tree specimens to be retained within the private open space areas within the development proposal shall be identified prior to construction by the CE in consultation with the ECO; and appropriately marked for protection during construction on site. xii. Construction should adhere to normal working hours to avoid night induced adverse visual impacts. No construction may occur on Sundays & Public Holidays. If construction work is necessitated to take place during night-time hours, the required notifications and permissions should be issued and light sources should be directed downwards well away from sensitive receptors. 	<ul style="list-style-type: none"> • Reduce the significance of anticipated adverse visual impacts to be associated with the construction of development proposals; and • Reduce the significance of nuisance experienced as a result of anticipated adverse visual impacts. 	<ul style="list-style-type: none"> • No comments and complaints received from surrounding residents and land-owners. 	<ul style="list-style-type: none"> • Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E12 HYDROLOGY			
<ul style="list-style-type: none"> i. In the event of pollution caused as a result of construction activities, the contractor, according to Section 20 of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) is be responsible for all costs incurred by organisations called to assist in pollution control and/or to clean up polluted areas. ii. No wastewater may enter any natural drainage lines or wetland/ watercourse areas. iii. Approval must be obtained from the DWA for the permissible water uses of those activities listed under Section 21 of the NWA. iv. Construction should preferably take place during the dry season. v. All construction vehicles should be kept in good working condition to reduce the risk of pollution due to leakages and spills. vi. All construction vehicles should be parked in demarcated areas when not in use and drip trays should be placed under vehicles to collect any spillages due to leaking plant. vii. If hydrocarbon spills occur these should be cleaned using SUNSORB (or similar product) and the contaminated soils removed from site and dispose of at an appropriate registered landfill site; viii. The 32m conservation buffer delineated for the identified watercourse should be fenced off and maintained for the duration of the construction activities (except for the area where minimal encroachment into the outer edge of the buffer is proposed at the south-eastern corner of the site). The demarcated area shall be maintained and designated as a “no-go” area which should be strictly enforced. ix. Erosion berms shall be installed when deemed necessary by the CE or ECO in order to prevent gully erosion and siltation of the wetland resource. x. Silt fences shall be installed along the periphery of the watercourse as delineated; and maintained for the duration of the construction phase to mitigate the adverse environmental impact of silt loaded surface water entering the watercourse. xi. Sheet run-off from paved surfaces and access roads need to be curtailed by using berms and other suitable structures as required to ensure flow velocities are reduced. This must be done in consultation with the RE as well as the ECO. Storm water, wherever possible, should be allowed to soak into the land in the area on which the water fell e.g. retention ponds. 	<ul style="list-style-type: none"> • Minimise pollution of soil, surface and ground water resources in the immediate and surrounding environments • Provide for the adequate protection of the watercourse identified through the application and maintenance of proper management practice • Minimise scarring of the soil surface and land features. 	<ul style="list-style-type: none"> • No visible and/or detected signs of water pollution and its associated environmental effect on the watercourse delineated; • No visible and/or detected signs of reduced quality of surface water entering the watercourse delineated; • No visible and/or detected signs of alterations to the physical structure of the watercourse delineated; • No visible and/or detected signs of degradation of the watercourse delineated; and • Minimum loss of topsoil; 	<ul style="list-style-type: none"> • As and when required. Monitor daily.

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E12 HYDROLOGY (CONTINUED...)			
<p>xii. Storm water shall not be allowed to enter/flow directly into the watercourse identified. Storm water shall be buffered by vegetation and energy dissipating interventions.</p> <p>xiii. Storm water flows from outlets shall not be concentrated, but spread out as far as possible.</p> <p>xiv. The re-vegetation of affected areas shall take place during construction, with reference to progressive rehabilitation practices.</p> <p>xv. Minimise and use one transportation route for conveying materials where possible;</p> <p>xvi. Stormwater retardation to be employed either through the use of bunding, placement of straw bales or the use of sandbags;</p> <p>xvii. Exposed soil to be stabilised by utilising an appropriate best management practice and preferable stabilisation to take place within 12 hours;</p> <p>xviii. No soil to remain un-stabilised for more than two days between 1 October and April; and</p> <p>xix. No soil to remain un-stabilised for more than seven days between 1 May and 30 September.</p>	<ul style="list-style-type: none"> • Minimise pollution of soil, surface and ground water resources in the immediate and surrounding environments • Provide for the adequate protection of the watercourse identified through the application and maintenance of proper management practice • Minimise scarring of the soil surface and land features. 	<ul style="list-style-type: none"> • No visible and/or detected signs of water pollution and its associated environmental effect on the watercourse delineated; • No visible and/or detected signs of reduced quality of surface water entering the watercourse delineated; • No visible and/or detected signs of alterations to the physical structure of the watercourse delineated; • No visible and/or detected signs of degradation of the watercourse delineated; and • Minimum loss of topsoil; 	<ul style="list-style-type: none"> • As and when required. Monitor daily.

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E13 SOIL			
<p>Topsoil is considered to be the natural soil covering, and to include all organic matter. Depth may vary at each site, and must be determined on a site-specific basis and removed accordingly. <i>For this reason it is an extremely valuable resource for the rehabilitation and vegetation of disturbed areas.</i></p> <p>Subsoil is the layer of soil immediately beneath the topsoil.</p> <ol style="list-style-type: none"> i. The contractors must provide and maintain a method statement for “management of topsoil” prior to the commencement of construction. ii. Topsoil must be stripped from all areas that are to be utilized during the construction period and where permanent structures and access is required. These areas will include the permanent works, pipeline trenches, stockpiles, access roads, construction camps and lay-down areas. iii. Topsoil must be stripped after clearing of woody vegetation and before excavation or construction commences. iv. At the beginning of the construction phase, topsoil removed for vegetation clearance must be stripped to a minimum depth of 150 mm and stockpiled on the demarcated topsoil stockpile areas. v. All topsoil must be removed and stockpiled at designated areas. These areas are to be marked as “no-go” areas. vi. Single handling is recommended. Topsoil stock piles must not be higher than 2m to avoid compaction. vii. All topsoil stockpiles and windrows shall be maintained throughout the contract period in a weed free condition. Weeds appearing on the stockpiled topsoil shall be removed by hand. viii. Subsoil shall be stored separately from the topsoil if not used for construction purposes. ix. Soil shall be stored, shaped and sited in such a way that they do not interfere with the flow of water such that damming or erosion is caused, or itself be eroded through the action of water. x. Dust suppression is necessary for stockpiles older than a month if deemed necessary by the PM, RE or ECO – with either water or a biodegradable chemical binding agent. Alternatively, stockpiles may be grassed. 	<ul style="list-style-type: none"> • Minimise scaring of the soil surface and land features • Minimise disturbance and loss of soil • Minimise construction footprint • Minimise sedimentation of nearby drainage lines • Maintain the integrity of topsoil’s for future landscaping and rehabilitation • Containment of invasive plant growth • Ensure stormwater system is functioning optimally • Address all exposed areas susceptible to erosion promptly to prevent the loss of valuable soil 	<ul style="list-style-type: none"> • No visible erosion scars once construction is completed • The footprint has not exceeded the proved development site. • Minimal invasive weed growth • No signs of sedimentation and erosion • Method statement • No visible and/or detected signs of environmental degradation as a result of erosion on site; • No detected signs of significant contamination of soil • No visible and/or detected signs of reduced quality of surface water entering the watercourse delineated • No visible and/or detected signs of ecological degradation of the watercourse delineated. 	<ul style="list-style-type: none"> • As and when required. Monitor daily.

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E13 SOIL (CONTINUED...)			
<ul style="list-style-type: none"> xi. Erosion berms should be installed to prevent gully formation and siltation of the wetland resource. The following points should serve to guide the placement of erosion berms: <ul style="list-style-type: none"> • Where the track has a slope of less than 2%, berms should be installed every 50m. • Where the track slopes between 2% and 10%, berms should be installed every 25m. • Where the track slopes between 10% and 15%, berms should be installed every 20m. • Where the track has a slope greater than 15%, berms should be installed every 10m. xii. Vegetation clearing should be kept to a minimum and phased where practical. xiii. As much vegetation growth as possible should be promoted within the proposed development area in order to protect soils and to reduce the percentage of the surface area which is paced. In this regard special mention is made of the need to use indigenous vegetation species as the first choice during landscaping; xiv. Backfilling must be undertaken in such a way that the final contours blend with the surrounding environment. xv. Remediated slopes must preferably be graded to slopes between 1:3 and 1:2. xvi. Remediated slopes can then be capped with topsoil. This requires a minimum layer of 100 mm in most areas. xvii. Disturbed surfaces to be rehabilitated must be ripped and the area must be covered with a layer of topsoil excavated from the site. xviii. Ripping must be done to a depth of 250 mm in two directions at right angles. Topsoil must be placed in the same soil zone from which it has been stripped. xix. All disturbed and compacted areas shall be sloped and ripped subsequent to construction, before rehabilitation commence. xx. The re-vegetation of affected areas shall take place concurrently during construction with specific reference to progressive rehabilitation practices. xxi. Hydrocarbon spills shall be remediated through the application of SUNSORB (or any similar product). All contaminated material shall be temporarily stored and removed from site, designated as hazardous waste. 	<ul style="list-style-type: none"> • As above. 	<ul style="list-style-type: none"> • As above. 	<ul style="list-style-type: none"> • As above.

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E14 REHABILITATION			
<ul style="list-style-type: none"> i. Rehabilitation shall ensure that all areas disturbed by the construction activity is returned to a near as possible natural state (similar or better state than before). ii. Rehabilitation must be undertaken at all areas associated with construction as specified by the PM and/or ECO. iii. Rehabilitation of all disturbed areas shall be conducted to the satisfaction of the PM and/or the ECO. iv. Rehabilitation, landscaping and/or revegetation must commence once works are complete in a particular area and acceptable groundcover (70% is an accepted standard in practise) must be achieved within 3 months. v. The developer should ensure that new trees are planted in order to replace those that have been cut down. vi. Access roads and other areas compacted by vehicles during construction must be scarified in order for plant roots to penetrate the soil and in effect promoting the restoration of natural vegetation. vii. Rehabilitation must be monitored in order to determine if methods implemented are successful. Where it is found that methods are not successful, the Contractor will continue to rehabilitate the areas using alternate methods until such time that the PM and ECO are satisfied. The cost of prolonged rehabilitation and alternate methods must be negotiated between the Contractor and the Developer. viii. Rehabilitation includes, but is not limited to, the following activities: <ul style="list-style-type: none"> • Collection and legal disposal of all contaminated soil by hydrocarbons (regarded as hazardous waste), by excavating to the depth of contaminant penetration and removal to a facility registered for the disposal of hazardous materials. • Collection and legal disposal of all rubble and construction waste associated with the development (unused materials including spoils, waste concrete and cement, waste water washings, litter etc). • Backfilling and contouring. • Ripping of compacted disturbed areas to a depth of 250 mm prior to the replacement of topsoil. • The eradication of invasive floral species that may have promulgated on the site due to construction activities. 	<ul style="list-style-type: none"> • Rectify any adverse aspects occurring during construction • Maintain the integrity of topsoil's for future landscaping and rehabilitation • Containment of invasive plant growth 	<ul style="list-style-type: none"> • No visible signs of affected areas (contaminated soils, erosion, compacted areas, etc.) • Minimal invasive weed growth • No signs of sedimentation and erosion • Method statement 	<ul style="list-style-type: none"> • Daily rehabilitation once initiated.

PHASE OF DEVELOPMENT	OPERATIONAL
IMPACT / ISSUE	OPERATIONS
SECTION	F

A detailed and site specific EMPr in respect of the operational phase of the proposed Huddle Township Development should be prepared by a suitable independent entity prior to the commencement of operations. The section below has however been included as reference and should be considered during the generation of the Operational EMPr. Note that for the Operational Phase, the Managing Body (i.e. Body Corporate, Home Owners Association) will assume the role of "Proponent" and will be responsible for ensuring compliance to the EMPr requirements and conditions of the Environmental Authorisation.

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
F1 SURFACE AND GROUND WATER CONTAMINATION			
<ul style="list-style-type: none"> i. Stormwater attenuation facilities shall be designated to filter/trap any contaminants prior to water discharged within the watercourse delineated. ii. The stormwater management system associated attenuation facilities shall be inspected on a periodic basis (i.e. quarterly) to assess the sufficient functioning thereof. iii. Hydrocarbon spillages shall be remediated through the application of SUNSORB (or a similar product). All contaminated material shall be removed from site and disposed off and/or treated prior to disposal at a registered facility. iv. The 32 m buffer delineated for the adjacent watercourse shall be maintained for the duration of the operational phase (except for the area where minimal encroachment into the outer edge of the buffer is proposed at the south-eastern corner of the site). The area shall be designated as private and/or public open space for the duration of the construction phase and will be the responsibility of the Managing Body of the Estate once handed over. 	<ul style="list-style-type: none"> • To provide for the adequate protection of surface and sub-surface water resources for the duration of the project life-cycle • To prevent the contamination and associated ecological degradation of the adjacent watercourse delineated • To provide for the sufficient functioning of the stormwater management system and attenuation facilities 	<ul style="list-style-type: none"> • Period inspection of stormwater management facilities attained • No visible and/or detected signs of water pollution and its associated environmental effect on the watercourse delineated • No visible and detectable signs of ecological degradation and impaired functionality of the watercourse delineated • No visible and detectable signs of encroachments and physical alterations to the delineated watercourse of the duration of the operational phase 	<ul style="list-style-type: none"> • As and when required • Monitoring facilitated at periodic intervals for the duration of the operational phase.

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
F2 SOIL CONTAMINATION			
<ul style="list-style-type: none"> i. All vehicles shall be kept in good working order. ii. All hydrocarbon spills shall be remediated through the application of SUNSORB (or any similar product). All contaminated material shall be either treated prior to disposal at a registered land-fill site, or disposed off as hazardous waste at a registered hazardous landfill facility. 	<ul style="list-style-type: none"> • To provide for the application of appropriate remedial actions in the event of any hydrocarbon spillages. 	<ul style="list-style-type: none"> • No detected signs of significant contamination of soil. 	<ul style="list-style-type: none"> • As and when required. Monitoring for the duration of the operational phase.
F3 AMBIENT NOISE			
<ul style="list-style-type: none"> i. The boundary wall or linked façade erected along south and eastern boundaries should be maintained for the duration of the operational phase. ii. Speed limits should be enforced for the duration of the operational phase. 	<ul style="list-style-type: none"> • To reduce the significance of the impact of the existing ambient noise on the development the operational phase • Maintain ambient noise levels for residential districts in suburban areas as per SANS 10103:2008 for the operational phase • Provide for maintenance of noise abatement measures for the operational phase 	<ul style="list-style-type: none"> • Noise levels are maintained to below the recommended daytime value of 50 dBA for residential districts in suburban areas as per SANS 10103:2008 for the operational phase • Noise abatement measures are maintained for the duration of the operational phase 	<ul style="list-style-type: none"> • Continually throughout the duration of the operational phase.
F4 COMMUNITY MATTERS			
<ul style="list-style-type: none"> i. The retail centre should not remain open late into the night to not disturb the neighbouring community. ii. The retail centre management should attempt to ensure that the retail centre is secure and that access of both vehicular and pedestrian traffic is regulated. iii. Security should be at the retail centre and management should ensure that the centre is patrolled by guards during non-operational hours. iv. The retail centre must remain neat at all times to not adversely affect the visual character of the area. v. Retail centre to cater for the needs of the residents and should not be specialty stores only, as this will alleviate some of the traffic impacts. vi. The lease agreements for the tenants must include a clause ensuring that their advertising is appropriate for the schools in the area. 	<ul style="list-style-type: none"> • Reduce the risk of potential incidences • Minimise the potential impact on the environment • Appropriately mitigate the effects of safety in the event that it is realised 	<ul style="list-style-type: none"> • No incidences reported 	<ul style="list-style-type: none"> • Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
F5 TRAFFIC			
<ul style="list-style-type: none"> i. See mitigation measures for construction phase, as some of these can be implemented during the operational phase. ii. The entrances to the development should be well signposted, so that motorists are able to drive cautiously in these areas, as vehicles entering and exiting the development will be driving at slower speeds than traffic on the roads. iii. Where possible, solutions that assist with the current school traffic and the school's parking problems should be adopted, such as additional entrances. 	<ul style="list-style-type: none"> • To reduce the significance of the anticipated impact of increased traffic on road network within in the vicinity of the development proposal; and • To provide for the consideration and implementation of the measures 	<ul style="list-style-type: none"> • The measures of proposed by the traffic engineer dually considered and implemented. 	<ul style="list-style-type: none"> • When required/once off during the project planning stages
F6 WASTE MANAGEMENT			
<ul style="list-style-type: none"> i. A suitable independent entity shall be appointed to prepare a site specific WMP for implementation during the operational phase to give effect to the sustainable and integrated management of waste items at the development with the main objective to increase efficiency and reduce the probability of potential adverse environmental impacts to be associated with the management of the said waste. ii. A specific designated area shall be established within the development for the storage of general and hazardous waste items. The said area shall not be located within any sensitive areas on site including below the 1:50 and 1:100 year floodline. Provision shall be made for sufficient bins for the temporary storage of general and hazardous waste items. Waste bins should be where feasible be marked (as per classification system) to indicate the allowed waste items to be temporarily stored on site. iii. Waste items must be classified at source according to a formal classification system (as outlined in the WMP) and separated into recyclable and non-recyclable waste. Waste items shall as a minimum be separated as follows: <ul style="list-style-type: none"> • Recyclable general waste (paper, plastics, metals, wood & glass); • Recyclable hazardous waste (used oil and other hydrocarbons); • Recyclable building waste including, but not limited to construction rubble; • Non-recyclable general waste; • Non-recyclable hazardous waste; and • Non-reusable building waste including but not limited to construction rubble. 	<ul style="list-style-type: none"> • Promote the sustainable and integrated management of waste on site as well as compliance with the general duty of care in respect of waste management as per the NEMWA, 2008 • Keep all areas within the development neat and litter free • Reduce the significance of potential visual impact(s) • Control the potential influx of vermin and flies thereby minimising potential diseases • Provide for the classification of waste at source into recyclables and non-recyclables • Provide for the establishment of a specific designated area for the appropriate storage of general and hazardous waste items • Provide for the collection of recyclable and non-recyclable waste 	<ul style="list-style-type: none"> • WMP prepared and implemented for the duration of operational phase • Waste items generated classified and separated at source according to a formal classification system • A specific designated area established for the storage of general and hazardous waste items • All recyclable and non-recyclable waste items collected by a suitable service provider on a periodic basis (i.e. weekly) 	<ul style="list-style-type: none"> • As and when required for the duration of the operational phase.

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
F6 WASTE MANAGEMENT (CONTINUED...)			
<p>iv. All separated recyclable general and hazardous waste shall be collected on a periodic basis (i.e. weekly) by relevant suitable recyclers.</p> <p>v. All non-recyclable general waste shall be collected on a periodic basis (i.e. weekly) by a suitable service provider for disposal at a registered land-fill facility.</p> <p>vi. All non-recyclable hazardous waste items shall be collected on a periodic basis (i.e. weekly) by a suitable service provider for treatment prior to disposal, and/or disposal at a licensed hazardous land-fill facility in the event that treatment would not occur.</p> <p>vii. All general waste items shall be temporarily stored in a manner which conforms to the general requirements for the storage of waste/general waste as per Section 21 and 22 of NEM:WA:</p> <ul style="list-style-type: none"> • Containers in which any waste is stored should be intact and not corroded or in any other way rendered unfit for the safe storage of waste. • Adequate/sufficient measures should be taken to prevent accidental spills or leaks; • Waste should be stored in a manner where by it will not be blown away by strong winds; • Waste should be stored in a manner to ensure that nuisances such as odour, nuisances, visual impact and breeding of vectors do not occur/arise; and • Waste should be stored in a manner to ensure that pollution of the environment and harm to health are prevented. <p>viii. All residents, land-owners, businesses etc, shall take cognisance and adhere to the general duty of care in respect of waste management as per Section 16 of NEMWA, 2008 for the duration of the operational phase.</p>	<ul style="list-style-type: none"> • Promote the sustainable and integrated management of waste on site as well as compliance with the general duty of care in respect of waste management as per NEMWA, 2008 • Keep all areas within the development neat and litter free • Reduce the significance of potential visual impact(s) • Control the potential influx of vermin and flies thereby minimising potential diseases • Provide for the classification of waste at source into recyclables and non-recyclables • Provide for the establishment of a specific designated area for the appropriate storage of general and hazardous waste items • Provide for the collection of recyclable and non-recyclable waste 	<ul style="list-style-type: none"> • WMP prepared and implemented for the duration of operational phase • Waste items generated classified and separated at source according to a formal classification system • A specific designated area established for the storage of general and hazardous waste items • All recyclable and non-recyclable waste items collected by a suitable service provider on a periodic basis (i.e. weekly) 	<ul style="list-style-type: none"> • As and when required for the duration of the operational phase.

PHASE OF DEVELOPMENT	PRE-CONSTRUCTION & CONSTRUCTION
IMPACT / ISSUE	ENVIRONMENTAL AUTHORISATION
SECTION	G
EA REFERENCE NUMBER	TO BE INSERTED IF APPROVED

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
G1 GENERAL CONDITIONS			
	•	•	•
G2 SPECIFIC CONDITIONS			
	•	•	•

SECTION 4: ENFORCEMENT, AUDITING & MONITORING

4.1 AUDITING AND MONITORING

The implementation of the provisions and/or management measures contained in the EMPr will be subjected to monitoring and review to ensure compliance. Reference is made to routine monitoring to verify, assess and report on compliance with the relevant provisions of the EMPr, according to a set performance criteria, provided for in this EMPr. Attention should specifically be given to the monitoring of aspects related to the bio-physical, cultural/heritage and social environment(s).

The ECO must conduct, (at a frequency as determined by the Department and stipulated in the relevant EA, or at the discretion of the PM where no frequency is prescribed) independent environmental audits on the requirements of the EMPr and the EA. Specific tasks and responsibilities of the ECO will include:

- Compile for approval by the competent authority an audit checklist based on the management measures and conditions of the EMPr and EA issued;
- Compliance site inspections (at the predetermined frequency) to verify and assess compliance with the relevant provisions of the EMPr and EA issued;
- Verify site environmental documentation during inspections/audits; and
- Compile environmental compliance assessment reports (audit report) following the site inspections, for submission to the applicant/client, project manager, ESO, main/building contractor and the relevant competent authority (if directed to do so).

Evidence of the following as **key performance indicators**, must be included in the audit reports where required:

1. Complaints received from landowners and actions taken.
2. Environmental incidents, such as oil spills, concrete spills, etc. and actions taken (litigation excluded).
3. Incidents leading to litigation and legal contraventions.
4. Environmental damage that needs rehabilitation measures to be taken.

The ESO will be directly responsible to enforce compliance with the provisions of the EA and EMPr. The ESO should conduct routine monitoring for the duration of the pre-construction and construction phases of the development proposal. The ESO will report directly to the ECO and in consultation with the ECO, identify actions to ensure compliance and/or measures to remediate/rehabilitate environmental damage(s) caused.

Site documentation including a copy of all ECO monitoring reports (external monitoring), ESO monitoring reports (internal monitoring), contractor environmental method statements and *pro forma* documentation (see Section 2.5 & Section 2.6) must be held by the ESO on site and be made available to ECO and any other member of the Project Technical Team upon request. The ECO must verify Environmental Documentation during the independent environmental audits.

4.1.1 Non-Compliance

It may not always be possible to carry out the mitigation measures as stipulated in this EMPr which

may result in future non-compliance. Penalties for non-compliance need to be discussed with the Contractor on appointment. The Contractor must make every effort to ensure that staff members comply with the EMPr, and enforce non-compliance penalties. Allowances must be made for the contractor to rectify all non-compliances, prior to issuance of penalties/fine.

The Contractor is deemed **NOT** to have complied with the EMPr if:

- a. within the boundaries of the site, site extensions and haul/ access roads there is evidence of contravention of the EMPr and/or EA which is confirmed and verified by the ECO;
- b. environmental damage ensues due to non-compliance of EMPr or EA requirements;
- c. the Contractor fails to comply with corrective or other instructions issued by the PM/CE/ECO or ESO within a specific time, and
- d. the Contractor fails to respond adequately to complaints from the public in line with requirements of this EMPr.

4.1.2 Tolerances

An Environmental Performance Guarantee of 5% of monthly invoices from the principle contractor will be retained by the client. Re-imbusement of guarantees will be paid to the principle contractor yearly (or on completion and handover) following review of compliance and issuing of a clearance certificate by the ECO.

Each non-conformance (in terms of this EMPr) not addressed within 4 weeks of being reported in ECO audit reports, may constitute a fine.

SECTION 5: NATIONAL AND PROVINCIAL LEGISLATION, POLICIES AND GUIDELINES

The common list of legislative references contained herein is by no means exhaustive but is applicable to the general principals of this document as well as to activities associated with the proposed development.

5.1 APPLICABLE LEGISLATION

Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996).

The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) has significant implications for environmental management. The main effects are the protection of environmental and property rights, the drastic change brought about by the sections dealing with administrative law such as access to information, just administrative action and broadening of the *locus standi* of litigants. These aspects provide general and overarching support and are of major assistance in the effective implementation of the environmental management principles and structures of the Environment Conservation Act, 1989 (Act No. 73 of 1989) [ECA] and NEMA. Section 24 in the Bill of Rights of the Constitution specifically states: *Everyone has the right -*

- *To an environment that is not harmful to their health or well-being; and*
- *To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that;*
- *Prevent pollution and ecological degradation;*
- *Promote conservation; and*
- *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*

National Environmental Management Act No. 107 of 1998

To provide for co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.

In terms of Section 28 of NEMA: *“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 be reasonable be avoided or stopped, to minimise or rectify such pollution or degradation of the environment”.*

It is the responsibility of the proponent, as well as any other party acting or performing work on behalf of the proponent to ensure material compliance (Compliance with Section 28) and continually illustrate that:

- All reasonable measures are taken to prevent pollution or degradation of the environment; and
- In the event if such damage to the environment is authorised by law that all reasonable measures are taken to minimise or rectify such pollution or degradation of the environment.

In addition, the proposed Huddle Township Development falls within the ambit of a listed activity as

per the 2010 EIA Regulations, and thus subsequently requires authorisation in terms of the NEMA prior to commencement.

National Environmental Management: Waste Act No. 59 of 2008

To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

In terms of Section 16 of NEM:WA which details the general duty of care, it is stated that, *“a holder of waste must within the holder’s power take all reasonable measures to:*

- *Avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;*
- *Reduce, re-use, recycle and recover waste;*
- *Where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;*
- *Manage the waste in such a manner that it does not endanger health or the environment or cause nuisance through noise, odour or visual impacts;*
- *Prevent any employee or person under his or her supervision from contravening this Act; and*
- *Prevent the waste from being used for an unauthorised purpose”.*

It is the responsibility of the proponent and any other party working for or acting on behalf of the proponent to ensure material compliance (Compliance with Section 16) and continually illustrate that all reasonable measures are taken to provide for the items as per Section 16 of NEMWA.

National Water Act, 1998 (Act No. 36 of 1998).

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected as well as integrated management of water resources with the delegation of powers to institutions at the regional or catchment level. The purpose of the Act is to ensure that the nation’s water resources are protected, used, developed, conserved, managed and controlled in responsible ways. The Act aims to regulate the use of water and activities, which may impact on water resources through the categorisation of ‘listed water uses’ encompassing water extraction, flow attenuation within catchments as well as the potential contamination of water resources, where the Department of Water Affairs (DWA) is the administering body in this regard.

The proposed Huddle Township Development is to be established in close proximity of a watercourse, as defined in terms of the NWA. Section 21 Water Use License Applications (WULA) is subsequently required for the proposed Huddle Township Development. Specific reference is made to Section 21(c) and (i).

Special reference is further made to Section 19 of the NWA which states: “An owner of land, or a person in control of land, or a person who occupies or uses land on which any activity or process, is or was performed or undertaken or any other situation arises which causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent such pollution from occurring, continuing or re-occurring.

It is the responsibility of the proponent, as well as any other party/entity acting or performing work on behalf of the proponent to ensure material compliance (Compliance with Section 19) and continually illustrate that all reasonable measures are taken to prevent the pollution of a water resource from occurring, continuing or reoccurring.

National Heritage Resources Act, 1999 (Act No. 25 of 1999).

This Act legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 hectares and where linear developments (including pipelines) exceed 300 metres in length. The Act makes provision for the potential destruction to existing sites, pending the archaeologist’s recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).

Water Services Act, 1997 (Act No. 108 of 1997).

This Act refers to service provision to consumers such as water supply and sanitation; (whereas the National Water Act deals with water in its natural state).

Other important acts which should also be consulted and may be relevant to the proposed development are:

Advertising on Roads and Ribbon Development Act No. 24 of 1940

Agricultural Resources Act No. 43 of 1983

Animals Protection Act No. 71 of 1962

Atmospheric Pollution Prevention Act No. 45 of 1965

Conservation of Agricultural Resources Act No. 43 of 1983

Electricity Regulation Act No. 4 of 2006

Environment Conservation Act No. 73 of 1989

Fencing Act No. 31 of 1963

Hazardous Substances Act No. 15 of 1973

Health Act No. 63 of 1977

National Act on Forests Act No. 84 of 1998

National Building Regulations and Standards Act 103 of 1977 (SABS 0400)

National Environmental Management: Air Quality Act 39 of 2004

National Road Traffic Act No. 93 of 1996

National Veldt and Forest Fires Act No.101 of 1998

Occupational Health and Safety Act No. 85 of 1993

Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)

Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000)

Road Transportation Act No. 74 of 1977

5.2 APPLICABLE POLICIES AND GUIDELINES

Integrated Environmental Management (IEM).

IEM is a procedure for ensuring that environmental considerations are fully integrated into all stages of the development process. This philosophy aims to achieve a desirable balance between conservation and development (DEAT, 1992). The IEM guidelines intend encouraging a pro-active approach to sourcing, collating and presenting information in a manner that can be interpreted at all levels.

National Spatial Biodiversity Assessment

The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on its biophysical characteristics, which are ranked according to priority levels.

South African National Standards

Standards as published by the South African Bureau of Standards which focus on developing market-relevant national standards that are harmonised with international standards. These standards exist principally to provide a reliable basis on which common expectations can be shared regarding specific characteristics of a product, service or process. South African National Standards (SANS) are voluntary in that there is no obligation to apply them or to comply with them, except in those cases where their application is directly demanded by regulatory instruments or contractual obligations. They do however in most cases form a good reference for best practise measures to be implemented.

Protected species – Provincial Ordinances.

Provincial ordinances were developed to protect particular plant species within predetermined provinces. The protection of these species is enforced through permitting requirements associated with provincial lists of protected species. Permits are administered by the provincial departments responsible for environmental affairs.

The Gauteng Conservation Plan (Version 2), 2005.

The Gauteng Conservation Plan or C-Plan has been compiled through the collection of biodiversity data for the Gauteng Province as part of the Gauteng Biodiversity Gap Analysis Project (“the Gauteng BGAP”). This has been analysed to produce the CPlan (Version 2). The purpose of the Gauteng BGAP is to identify and map areas that are of importance to biodiversity protection in Gauteng through a systematic and empirical conservation – planning programme, and to provide recommendations and policy strategies for the conservation and management of these areas. This information is to be used to identify potentially sensitive sites.

Gauteng – Regional Spatial Development Framework (RSDF): Region E, 2010.

The Regional Spatial Development Framework (RSDF), together with the Spatial Development Framework (SDF), represents the prevailing spatial planning policy within the City of Johannesburg. These spatial planning policy documents are prepared and adopted in terms of the Municipal Systems Act, 2000 (Act No. 32 of 2000) as an integral component of the City's Integrated Development Plan (IDP).

According to the RSDF, Club Street and Linksfield Road have been identified as east – west mobility roads within the CJMM. As such the maintenance and upgrade of these roads are important in

maintaining the efficient connectivity of the metropolitan to the surrounding areas. The proposed development will upgrade a section of Club Street (See Section E-6.1.3) and thus is in line with the RSDf of the city, with regards to traffic and the road network.

City of Johannesburg Integrated Development Plan 2012 - 2016

An IDP encourages both short- and long-term planning. In the short term it assists in addressing issues or challenges that may be resolved within the relevant term of office while at the same time it provides space for the long term development of the area in an integrated and coordinated manner.

The IDP states that the most desired and efficient urban form is compact with mixed land use and attractive environments for walking and cycling. The proposed development achieves this by virtue of the fact that it has residential 1 and 3, private open space and business/commercial land use components.

5.3 GENERAL GUIDELINES

The following measures provide guideline solutions to frequently anticipated issues on most development activities.

- The prevention of any site degradation due to non-compliance, administrative or financial problems, and inactivity during the construction phase, illegal activities, delays caused by archaeological finds, etc. is ultimately the responsibility of the applicant/developer. Section 28, National Environmental Management Act [NEMA] (Act No. 107 of 1998)
- The study area must be clearly defined, surveyed and fenced according to the project authorisation. All workforce members and other construction personnel are not to go beyond the fenced footprint (especially towards the adjacent Wilds Nature Reserve and private property). Landowners are not comfortable when strangers come on to their properties. They will look for reasons to interfere with the construction process and may therefore cause delays in the process that can be very costly to the Contractor.
- The Contractors must adhere to agreed and approved access points and haul roads.
- No camping is allowed on any private property.
- Damage to private or public property such as fences, gates and other infrastructure may occur at any time. All damage to be repaired immediately and to the satisfaction of the relevant owner.
- Relevant landowners and businesses must be informed of the starting date of construction as well as the phases in which the construction shall take place.
- The Contractor must adhere to all conditions of contract including this EMPr.
- Proper planning of the construction process must be undertaken to allow for disruptions due to rain and very wet conditions.
- Where existing private roads to be utilised as access are in a bad state of repair, such roads' condition must be well documented, including photographs, before they are used for construction purposes. If necessary some repairs must be done to prevent damage to equipment and plant.
- All private and public manmade structures (as well as those earmarked to be preserved) on or near the project site must be protected against damage at all times and any damage must be rectified immediately.

- Proper site management and regular monitoring of site works should be undertaken.
- Proper documentation and record keeping of all complaints and actions should be taken.
- Regular site inspections to ensue and good control over the construction process throughout the construction period.
- A positive attitude towards Environmental Management by all site personnel must be motivated through regular and effective awareness and training sessions (see Section 2.2).
- An ESO, on behalf of the Contractor, is to be appointed to implement this EMPr. The EO and not the Contractor or his/her ESO is to deal with any landowner related matters (see figure 2)
- Environmental Audits to be carried out during and upon completion of construction.

SECTION 6: DETAIL OF THE PERSON/S RESPONSIBLE FOR DEVELOPING AND REVIEWING THE EMPR

DETAILS OF THE INDEPENDENT ENVIRONMENTAL MANAGERS AND IMPACT ASSESSORS:

Strategic Environmental Focus (SEF) is an environmental consultancy that specialises in assisting the private sector and government in managing the sustainability of our natural resources. SEF has been proactively providing these sustainable solutions for over 15 years, with offices located across the major centres of South Africa, as well as offering global expertise through years of experience providing these sustainable solutions on many international projects. Persons at SEF which are involved in the project include:

WILLIE HOWELL (PROJECT MANAGEMENT AND REVIEW)

A Project Manager with over 10 years' experience in the mining, industrial and transportation sectors. Originally a GIS specialist, he gained invaluable background knowledge with regard to sectors in which he now operates as an Environmental Scientist. Projects to date include the compilation of a supporting technical report for the 2010 Soccer World Cup bid, environmental issues affected by freight transport in Gauteng and KwaZulu-Natal, Social Surveys of taxi and bus facilities to meet the Land Transport Act, an Environmental Profile and Plan for the East West Corridor and Basic Assessments and EIAs for SANRAL's road upgrading programme in Gauteng.

Willie also worked on the multi-award winning Berg River project in the Western Cape where he project managed various social components of a Sustainable Utilization Plan and Social Monitoring of the impacts of the construction of the Berg River Dam and appurtenant works. He has also been involved in Independent Socio-Economic monitoring of the Gautrain project and Environmental Scientist Studies on bridges and various Environmental Studies at an Automotive Supplier Park. Mining experience covered work for Ashanti Gold and diamond mines in Lesotho.

Willie also worked as Project Manager for the Kusile Power Station Water Use Licenses. He worked on various projects in the DRC for Anvil mining which included Environmental Impact Assessments, Environmental Management Plans and Social Studies. Further work experience includes the Environmental Impact Assessment and Environmental Management Plan for the Neckertal Dam Construction and related activities in Namibia.

MANIE CILLIERS (REPORT WRITING)

Manie studied at the University of the North-West and completed his B.Hons in Environmental Sciences in December 2009 after obtaining his degree in B.Sc Botany and Geography. He started working at SEF from March 2010 and currently holds the position of Environmental Manager and Environmental Compliance Officer. He has extensive experience and knowledge of Environmental Management, Compliance Monitoring, Performance Assessments and Auditing. His scope of works further covers Liaising with Authorities, Compiling of Reports, Public Participation management of projects, and administrative work.

ANNEXURE 1: DECLARATION OF UNDERSTANDING BY THE DEVELOPER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

ANNEXURE 2: DECLARATION OF UNDERSTANDING BY THE PROJECT MANAGER / ENGINEER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

ANNEXURE 3: DECLARATION OF UNDERSTANDING BY THE CONTRACTOR

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

ANNEXURE 4: DECLARATION OF UNDERSTANDING BY THE ENVIRONMENTAL SITE OFFICER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

ANNEXURE 5A (SAMPLE): METHOD STATEMENT EXAMPLE

Contract No		Date		CONTRACTOR DETAIL (Logo, physical address, etc.)
Contract Name		Rev		

ENVIRONMENTAL METHOD STATEMENT

<ACTIVITY> e.g. SOLID WASTE MANAGEMENT

Scope

Short scope of the method statement in terms of the identified activity (Solid Waste Management) <e.g. This method statement outlines the collecting, handling, classification, separating, storage and safe disposal of solid waste. Efforts should be made to eliminate or minimize waste in general, but if not possible, recycling, reuse or safe disposal shall be managed.>

Relevant Legislation, Norms and Standards

All applicable Legislation, Norms and Standards relevant to the identified activity (Solid Waste Management)

National Environmental Management Act, 1998 (Act No. 107 of 1998);
 National Environmental Management: Waste Act, 2008 (Act No. 58 of 2008);
 Municipal by-laws pertaining to the Management of Waste;
 National Domestic Waste Collection Standards GN 1475 in GG 32687 of 2009.11.06;
 Draft National Standards for Disposal of Waste to Landfill GN 432 in GG 34414 of 2011.07.01;
 Draft National Standards for Assessment of Waste for Landfill Disposal GN 433 in GG 34415 of 2011.07.01;
 National Draft Waste Classification and Management Regulations GN 435 in GG 34417 of 2011.07.01;
 National Draft Norms and Standards for the Storage of Waste GN 436 in GG 34418 of 2011.07.01;
 SANS 10228 – Classification of dangerous goods;
 DWAF Minimum Requirements for Waste Disposal by Landfill, 2nd Edition.

Introduction

Short Introduction <e.g. I.Build Construction has been appointed by A Company (Pty) Ltd. for the construction of a new office block within the Silvercloud Node, Pretoria, Gauteng. Waste anticipated to be generated on site includes: General waste, builders rubble, Spoil material and hazardous waste.>

Works, Management Actions, Control Measures

This section must be site specific. See example below

- Currently two waste baskets (constructed from wire mesh and enclosed by shade cloth) is present on site. These waste baskets are for the exclusive storage of general waste and shall be placed at strategic point on site where active works is taking place.
- All general waste is stockpiled at a designated area within the site office camp area. The stockpile is covered by a plastic sheet to deter windblown litter from occurring on site.
- Waste is removed to approved and registered municipal landfill sites by <sub-contractor detail>.
- Landfill sites to be used are <Landfill Site> <Registration number>.
- A waste log shall be kept of the date, quantity and date of waste removed from site. The Site Agent shall be responsible for signing the waste register as confirmation of collection and disposal.
- Waste shall be separated into hazardous and non-hazardous waste streams.
- Hazardous waste shall be deposited in a dedicated, impermeable hazardous waste bin for later removal to a licensed hazardous waste facility.
- Red bins or red marked bins shall always be used for hazardous waste like oil filters, rags and bags of contaminated soil from cleared up spills.
- Safe disposal certificates shall be obtained for all hazardous waste removed from site.
- The certificates shall be kept on file.
- Employees shall be educated and made aware (toolbox talks) of not littering, waste separation and the importance of a waste management system.
- Waste shall never be buried, burned or dumped in unauthorized areas.

Declarations for Environmental Method Statement for <Activity>

1) ENGINEER / PROJECT MANAGER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

Engineer/PM Approval

Date

Signature

Jack Civil

2) ENVIRONMENTAL CONTROL OFFICER (ECO)

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

ECO Approval

Date

Signature

Joe Green

3) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

Contractor Approval

Date

Signature

John Doe

ANNEXURE 5B (SAMPLE): METHOD STATEMENT TEMPLATE

Contract No		Date		
Contract Name		Rev		

ENVIRONMENTAL METHOD STATEMENT

Activity:

SCOPE

*Insert additional pages as required

RELEVANT LEGISLATION, NORMS AND STANDARDS

*Insert additional pages as required

INTRODUCTION

*Insert additional pages as required

WORKS, MANAGEMENT ACTIONS, CONTROLS

*Insert additional pages as required

DECLARATIONS FOR ENVIRONMENTAL METHOD STATEMENT: _____

1) ENGINEER / PROJECT MANAGER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

Engineer/PM Approval

Date

Signature

2) ENVIRONMENTAL CONTROL OFFICER (ECO)

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

ECO Approval

Date

Signature

3) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

Contractor Approval

Date

Signature

ANNEXURE 6 (SAMPLE): ENVIRONMENTAL INCIDENT REGISTER

ENVIRONMENTAL INCIDENT REGISTER					
Date	Time	Location and Nature of Incident	Corrective Action Taken <i>(Give details and attach documentation as far as possible)</i>	Comments <i>(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)</i>	Signature

ANNEXURE 7 (SAMPLE): COMPLAINTS REGISTER

COMPLAINTS REGISTER					
Date	Time	Name & Contact details of lodger of Complaint	Location and Nature of Complaint <i>(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)</i>	Corrective Action Taken <i>(Give details and attach documentation as far as possible)</i>	Signature