

## ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

### COMPILER OF EMPr

The Environmental Management Programme (EMPr) is compiled by:

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- National Diploma in Agricultural Extension - Pretoria Technicon - 1974
- Certificate in Resource Utilization and Identification & Stereoscopic Interpretation (soil classification and determination of potential and land use planning) - Potchefstroom Agricultural College – 1980
- Soil Conservation (Hydrology, structures and hydraulics) – Directorate Soil Conservation and Drilling Services - 1994
- Diploma in Project Management - DAMELIN – 1999

**Courses / Workshops / Seminars attended**

- Veld Management – stocking rates and rotational grazing practises and fire as a management tool (Department of Agriculture)
- Near shore physical processes – Coastal zone management (CSIR)
- Minimum tillage and reduced run-off (CSIR)
- Soil classification (Department of Agriculture)
- Soil Conservation Structures (Department of Agriculture)
- Construction and Asbestos Regulations (NOSA)
- Occupational Health & Safety Act (SAACE)
- The New Construction Regulations (SAACE)
- Soil analysis and fertiliser recommendations (Dept. of Agriculture)
- Irrigation design and scheduling - (Department of Agriculture)
- Boreholes – abstraction design and pump selection (S&L / Matheson & Bremner)
- Quality Management System ISO 9000 (SAACE)

Curriculum Vitae attached as Appendix A

### INTRODUCTION

The Department Rural Development and Agrarian Reform intends constructing a citrus pack house at Ripplemead in the Ngushwa Municipal area. The general principles contained within the EMPr shall apply to all construction activities. All construction activities shall thus observe and obey any other relevant environmental legislation and in so doing undertaken in such a manner as to minimise impacts on the surrounding area, the public and local residents. The size of the construction area shall be minimised and all areas disturbed during construction shall be re-instated.

## **TO BE READ IN CONJUNCTION WITH THE ENVIRONMENTAL AUTHORISATION & CONTRACT DOCUMENTATION**

### **1. SCOPE**

This EMPr covers the requirements for controlling the impact of construction activities on the environment.

### **2. INTERPRETATIONS**

#### **2.1 Supporting Specifications**

Where this Specification is required for a project the following specifications shall, inter alia, form part of the Contract Document.

- (a) Project Specification;
- (b) SANS 1200 A or SANS 1200 AA, as applicable.

#### **2.2 Application**

This Specification contains clauses that are generally applicable to the undertaking of civil engineering works in areas where it is necessary to impose pro-active controls on the extent to which the construction activities impact on the environment. Interpretations and variations of this Specification are set out in Portion 2 of the Project Specification (see 2.1). In the event of any difference or discrepancy between the provisions of the Standardized Specifications and the provisions of this Specification, the latter shall prevail.

#### **2.3 Definitions**

For the purposes of this Specification the definitions and abbreviations given in the applicable Specifications listed in 2.1 and the following definitions shall apply:

Environment: 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.

Potentially Hazardous Substance: A substance that, in the reasonable opinion of the Engineer, can have a deleterious effect on the environment.

Method Statement: A written submission by the Contractor to the Engineer in response to the Specification or a request by the Engineer, setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the Engineer when requesting the Method Statement, in such detail that the Engineer is enabled to assess whether the Contractor's proposal is in accordance with the Specifications, EMPr and Environmental Authorisation and/or will produce results in accordance with the Specifications, EMPr and Environmental Authorisation.

The Method Statement shall cover applicable details with regard to:

- Construction procedures
- Materials and equipment to be used
- Transportation of equipment/materials to and from Site
- Movement of equipment/materials on Site
- Storage of materials on Site
- Containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur
- Timing and location of activities
- Placement of waste rock and overburden
- Rehabilitation of the environment (refer 5.16)
- Areas of non-compliance with the Specifications, EMPr and Environmental Authorisation, and
- Any other information deemed necessary by the Engineer

Reasonable: Unless the context indicates otherwise, reasonable in the opinion of the Engineer after he has consulted with a person, not an employee of the Employer, suitably experienced in “environmental implementation plans” and “environmental management plans” (both as defined in Act No. 107, 1998).

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

Contract: The General Conditions of Contract and Special Conditions, Specifications, Drawings, Tender, written records of matters agreed after the submission of the Contractor’s tender, Letter of Acceptance and Agreement, together with other documents which the parties have agreed in writing shall form part of the Contract and such amendments or additions to the Contract as may be agreed in writing between the parties.

Contaminated Water: Water contaminated by the Contractor’s activities, e.g. concrete water and runoff from plant/personnel wash areas.

### **3. MATERIALS**

#### **3.1 Materials Handling, Use and Storage**

The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions (including “no go” areas) required to comply with the Specifications. The Contractor shall ensure that these delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the Specifications. Materials shall be appropriately secured and covered to ensure safe passage between destinations. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or supplier to properly secure transported materials. All manufactured and/or imported material shall be stored within the Contractor’s camp, and, if so required by the Project Specification, out of the rain. All lay down areas outside of the construction camp shall be subject to the Engineer’s approval.

### **3.2 Hazardous Substances**

Hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) used during construction shall be stored in secondary containers. The relevant Material Safety Data Sheets (MSDS) shall be available on Site. Procedures detailed in the MSDS's shall be followed in the event of an emergency situation. Potentially hazardous substances shall be stored, handled and disposed of as prescribed by the Engineer.

## **4. CONSTRUCTION CAMP & PLANT**

### **4.1 Construction Camp**

The construction camp and stores should preferably be located within the community area.

### **4.2 Ablution Facilities**

A sufficient number of chemical toilets shall be provided by the contractor in the construction camp area and at appropriate locations within the development area as approved by the Engineer. The ratio of ablution facilities to workers should not be less than that required by the Construction Regulations 2003 of the Occupational Health and Safety Act and facilities shall be located within 100 m from any point of work but no closer than 50 m to any wetland, known flood line, water body or river. All temporary/portable toilets shall be secured to the ground to prevent them from toppling due to wind or any other cause. The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are properly stored and removed to a registered waste site. Discharge of waste from toilets into the environment and burial of waste is strictly prohibited. Washing whether of the person or of personal effects and acts of excretion and urination are strictly prohibited other than at the facilities provided.

### **4.3 Solid Waste Management**

The Contractor shall provide sufficient bins with lids on Site and no on-Site burying, dumping or burning of any waste materials, vegetation, litter or refuse shall occur. Bins shall be emptied a minimum of once daily. The waste may be temporarily stored on Site in a central waste area that is weatherproof and scavenger-proof, as approved by the Engineer. All solid waste shall be disposed of off-Site at an approved Municipal landfill Site. The Contractor shall supply the Engineer with a certificate of disposal.

### **4.4 Contaminated Water**

Contractor shall set up a contaminated water management system, which shall include collection facilities, as well as suitable methods of disposal of contaminated water. The Contractor shall prevent the discharge of water contaminated with any pollutants, into the environment. The Contractor shall notify the Engineer immediately of any pollution incidents of Site. The Engineer's approval is required prior to the discharge of contaminated water to the Municipal sewer system.

### **4.5 Noise**

The Contractor shall limit noise levels (e.g. install and maintain silencers on machinery). The provisions of SANS 1200A Sub Clause 4.1 regarding "built-up areas" shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas. Appropriate directional and intensity settings are to be maintained on all hooters and sirens and no amplified music shall be allowed on Site other than in emergency situations. The Contractor shall restrict any of his operations that may result in undue noise disturbance to the hours of 08:00 to 17:00 on weekdays and Saturdays. Unless otherwise agreed to with the Engineer.

#### **4.6 Fuel (Petrol and Diesel) and Oil**

Fuel may be stored on Site in an area approved by the Engineer. The Contractor shall ensure that all liquid fuels (petrol and diesel) are stored in tanks with lids, which are kept firmly shut or in bowsers. The tanks/bowsers shall be situated on a smooth impermeable surface (concrete or 250 µm plastic) with an earth bund (plastic must have a 5cm layer of sand on top to prevent damage and perishing). The impermeable lining shall extend over the crest of the bund and the volume inside the bund shall be 130% of the total capacity of all the storage tanks/bowsers. Provision shall be made for refueling at the fuel storage area, by protecting the soil with 250 µm plastic covered with minimum of a 5 cm layer of sand. The Contractor shall prevent unauthorized access into the fuel storage area. No smoking shall be allowed within the vicinity of the fuel storage area. The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel stores.

#### **4.7 Equipment Maintenance and Storage**

All vehicles and equipment shall be kept in good working order. Leaking equipment shall be repaired immediately or removed from the Site. Where practical, maintenance of plant shall not occur on Site. Where emergency maintenance is necessary, the Contractor shall ensure that this does not result in contamination of the soil or vegetation. Drip trays shall be provided in construction areas for stationary and "parked" plant as well as during emergency servicing of vehicles. Drip trays shall be inspected and emptied daily. The contents of drip trays shall be disposed of at an authorized facility. Drip trays shall be closely monitored during rain events to ensure that they do not overflow. The washing of equipment shall be restricted to urgent or preventative maintenance requirements only. The use of detergents for washing shall be restricted to low phosphate and nitrate containing, low sudsing-type detergents.

### **5. CONSTRUCTION**

#### **5.1 Method Statements**

Any Method Statement required by the Engineer, Specification EMA or the Project Specification shall be produced within such reasonable time as the Engineer shall specify or as required by Specification EMA or the Project Specification. The Contractor shall not commence the activity until the Method Statement has been approved. Except in the case of emergency activities, the Contractor shall allow a period of two weeks for approval of the Method Statement by the Engineer. Such approval shall not unreasonably be withheld.

The Engineer may require changes to a Method Statement if the proposal does not comply with the specification or if, in the reasonable opinion of the Engineer, the proposal may result in, or carries a greater than reasonable risk of, damage to the environment in excess of that permitted by the Specifications.

Approved Method Statements shall be readily available on the Site and shall be communicated to all relevant personnel. The Contractor shall carry out the Works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract.

Method Statements that shall be provided by the Contractor within 14 days of receipt of the letter of acceptance and prior to the activity covered by the Method Statement being undertaken.

Method Statements shall include:

1. Location and structure of the fuel storage Site, including the type and volume of storage container and the design and capacity of the bund.
2. Solid waste (refuse) control and removal of waste from the Site, including the number, type and location of rubbish bins, the manner and frequency with which the waste will be removed from Site and the disposal Site.
3. Contaminated water management system, including an indication of the source and volume of contaminated water and how this would be disposed of.
4. Emergency procedures for fire, and accidental leaks and spillages of hazardous materials.

## **5.2 Environmental Awareness Training**

Within seven days of the Commencement Date, the Contractor's Site staff, namely Site Management staff and foremen shall attend an environmental awareness training course arranged by the environmental control officer (ECO) appointed by the applicant (client). The Contractor shall liaise with the Engineer prior to the Commencement Date to fix a date and venue for the course. The Contractor shall provide a suitable venue with facilities as required by the Project Specification, and ensure that the specified employees attend the course.

Any new employees coming onto Site after the initial training course and the Contractor's sub-contractors shall be provided with the information by the Contractor. The Contractor shall ensure that all attendees sign an attendance register, and shall provide the Engineer with a copy of the attendance register the day after each course. This training will be for the contractor's account.

## **5.3 Construction Personnel Information Posters**

As required by the Project Specification, the Contractor shall erect and maintain information posters for the information of his employees depicting actions to be taken to ensure compliance with aspects of the Specifications. Such posters shall be erected at a location specified by the Engineer.

## **5.4 Site Clearance**

The Contractor shall ensure that the clearance of vegetation is restricted to that required to facilitate the execution of the Works. Site clearance shall occur in a planned manner, and cleared areas shall be stabilized as soon as possible. Natural vegetation and top-soil shall be properly stockpiled for re-use during rehabilitation. The detail of vegetation clearing shall be subject to the Engineer's approval. Should fauna or Archaeological and Paleontological Remains be encountered during Site clearance, earthworks shall cease until these matters have been properly addressed.

## **5.5 Site Division and Site Demarcation**

The Contractor shall restrict all his activities, materials, equipment and personnel to within the area specified. As required by the Project Specification, the Contractor shall erect and maintain permanent and/ or temporary fences of the type and in the locations directed by the Engineer. Such fences shall, if so specified, be erected before undertaking designated activities.

## **5.6 Access Routes / Haul Roads**

On the Site, and, if so required by the Project Specification, within such distance of the Site as may be stated, the Contractor shall control the movement of all vehicles and plant including that of his supplier so that they remain on designated routes, are distributed so as not to cause an undue concentration of traffic

and that all relevant laws are complied with. In addition such vehicles and plant shall be so routed and operated as to minimize disruption to regular users of the routes not on the Site. On gravel or earth roads on Site and within 500m of the Site, the vehicles of the Contractor and his supplier shall not exceed a speed of 20km/hr. Mud and sand deposited onto public roads by construction activities shall be cleared on a daily basis. No travel is allowed within the 1-in-100 year flood zone

### **5.7 Cement and Concrete Batching**

Where applicable, the location of the batching plant (including the location of cement stores, sand and aggregate stockpiles) shall be as approved by the Engineer. The concrete/cement batching plant shall be kept neat and clean at all times. The batching plant shall be located on a smooth impermeable surface (plastic) and shall be bunded and sloped towards a sump to contain spillages of substances. All wastewater resulting from batching of concrete shall be disposed of via the contaminated water management system and shall not be discharged into the environment. Empty cement bags shall be stored in temporary weatherproof containers and shall be disposed of on a regular basis via the solid waste management system. The Contractor shall take all reasonable measures to prevent the spillage of cement/concrete during batching and construction operations. During pouring, the soil surface shall be protected using plastic and all visible remains of concrete shall be physically removed on completion of the cement/concrete pour and appropriately disposed of via the solid waste management system.

Where "ready-mix" concrete is used, the Contractor shall ensure that the delivery vehicles do not empty their chutes directly onto the ground. Any spillage resulting from the "ready-mix" delivery shall be immediately cleared and disposed of via the solid waste management system.

### **5.8 Fire Control**

No fires may be lit on Site. Any fires that occur shall be reported to the Engineer immediately. Smoking shall not be permitted in those areas where it is a fire hazard. In terms of the Atmospheric Pollution Prevention Act (No. 45 of 1965), burning is not permitted as a disposal method.

The Contractor shall appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedure to be followed. The Contractor shall forward the name of the Fire Officer to the Engineer for his approval.

The Contractor shall ensure that there is basic fire-fighting equipment available on Site at all times. This shall include at least rubber beaters when working in open spaces and at least one fire extinguisher of the appropriate type when welding or other "hot" activities are undertaken.

### **5.9 Emergency Procedures**

The Contractor shall ensure that his employees are aware of the procedure to be followed for dealing with spills and leaks, which shall include notifying the Engineer and the relevant authorities. The Contractor shall ensure that the necessary materials and equipment for dealing with spills and leaks is available on Site at all times. Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the Engineer.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The area shall be cordoned off and secured. The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/breakdown and where possible be designed to encapsulate

minor hydrocarbon spillage. The quantity of such materials shall be able to handle a minimum of 200 litres of hydrocarbon liquid spill.

#### **5.10 Community Relations**

The Contractor shall record any complaints or queries from the public, as well as the action taken in response, in the Site request book. Complaints and associated responses shall be communicated to the Engineer on a weekly basis. The Contractor's contact details shall be posted on the Site board to enable the public to telephone should they have any queries or complaints.

#### **5.11 Protection of Natural Features**

The Contractor shall not deface, paint, damage or mark any natural features (e.g. rock formations) situated in or around the Site for survey or other purposes unless agreed beforehand with the Engineer. Any features affected by the Contractor in contravention of this clause shall be restored / rehabilitated to the satisfaction of the Engineer. The Contractor shall not permit his employees to make use of any natural water sources (e.g. springs, streams, open water bodies) for the purposes of swimming, personal washing and the washing of machinery or clothes.

#### **5.12 Protection of Flora and Fauna**

Except to the extent necessary for the carrying out of the Works, flora shall not be removed, damaged or disturbed nor shall any vegetation be planted without authorization. No listed tree, aloe or vegetation may be removed without prior authorization from DEAFET and DAFF. It is the responsibility of the Contractor to comply with this specification. Trapping, poisoning and / or shooting of animals is strictly forbidden. No domestic pets or livestock are permitted on Site.

#### **5.13 Protection of Archaeological and Paleontological Remains**

The Contractor shall take reasonable precautions to prevent any person from removing or damaging any fossils, coins, articles of value or antiquity and structures and other remains of archaeological interest discovered on the Site, immediately upon discovery thereof and before removal. The Contractor shall inform the Engineer immediately of such a discovery and carry out the Engineers instructions for dealing therewith. All works within the vicinity of the discovery must cease immediately and the area shall be cordoned off until such time as the Engineer authorizes resumption of the works in writing. Any associated costs will be at the cost of the client (applicant).

- a) An archaeologist should be consulted if flaked stone artefacts, accumulations of bones and graves or human remains are found
- b) A palaeontologist consulted if any fossil plant material, bones or teeth and or trace fossils are discovered

#### **5.14 Stockpiling**

The Engineer will identify suitable sites for stockpiling. Stockpiles shall be convex in shape, shall be no higher than 2m and shall be located so as to cause minimal disturbance. Where required, appropriate precautions shall be taken to prevent the erosion and limit the compaction of the stockpiles. The Contractor shall ensure that all stockpiles do not result in the damming of water or run off, or is itself washed away. Stockpiles will be temporary only and materials not used in the construction will be removed to a registered Municipal waste site.



### **5.15 Dust**

The Contractor shall take all reasonable measures to minimize the generation of dust as a result of construction activities to the satisfaction of the Engineer. Appropriate dust suppression measures, e.g. dampening with water, shall be used when dust generation is unavoidable, particularly during prolonged periods of dry weather. Dust suppression measures shall be agreed upon in consultation with the Engineer.

### **5.16 Rehabilitation of the Environment**

All land which is disturbed during construction, including any roadside "cut", abandoned track, exposed verge, back-filled trench, area used for stockpiling of construction materials and camp/stores site must be rehabilitated at closure of the contract.

On completion of operations, the vehicle maintenance yard, secured storage areas and camp site shall be cleared of any contaminated soil, which must be dumped at an approved area. All building rubble shall be removed to a registered Municipal waste site.

The surface area shall then be scarified or ripped to a depth of at least 300 mm and the topsoil previously stored adjacent to the site, shall be spread evenly to its original depth over the whole area. The area shall then be fertilised if necessary (based on a soil analysis). The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.

Topsoil (sods of natural vegetation) must be returned and spread over the areas to be rehabilitated to a minimum depth of 200 mm. If there is insufficient topsoil/natural vegetation to cover the entire area, then topsoil must be spread in strips of  $\pm 2$  m wide placed at right angles to the natural slope so as to control run-off.

Vegetation must be re-established on surrounding or denuded areas impacted upon by the project. Ideally, soil samples should be submitted for analysis and the generation of a fertiliser programme. A seed merchant in the area should be consulted to recommend an appropriate seed mix for the area. Watering should be considered if planting is done in a dry period

Livestock should if at all possible, be kept off of the rehabilitated areas until the grasses are well established.

### **5.17 Additional for the management of construction solid waste**

- a) Concrete waste shall be disposed of at a Municipal solid waste site, with prior authorisation from the Municipality.
- b) Excavated stone and/or rock must not be left abandoned at the excavation sites. That which is not used for gabions or reno mattresses or protection works must be removed to a registered Municipal waste site.

## **6. PERSONS RESPONSIBLE FOR THE IMPLEMENTATION OF THE MEASURES**

- a) The Contractor shall be held responsible for all construction and reinstatement of the project area for the duration of the contract and maintenance period until full rehabilitation has taken place. All structures damaged or interfered with by the Contractor shall be restored to a condition at least equivalent to their original condition.
- b) The Contractor shall be held responsible for keeping the operational plant in good repair and will minimise pollution or contamination of the soil and water. In the event of a spillage oil (diesel, oil, fuels, etc.), the Contractor must take suitable measures to contain the pollution and prevent it from spreading. The Department Economic Development, Environmental Affairs & Tourism (DEDEAT) and DWA must be informed immediately such spillage occurs. Once the spill has been contained, contaminated material (soil, etc.) shall be removed and disposed of using methods as specified by DEDEAT and/or any other relevant State Authority.
- c) The Contractor shall be deemed responsible for implementation of the environmental management aspects in terms of the DEDEAT and DWA authorisations.
- d) The Applicant and the Consulting Engineer shall monitor the construction and general environmental management process. The Consulting Engineer is responsible for ensuring that the Contractor abides by the conditions in this EMP, Basic Assessment Report and whatever additional conditions DEDEAT may set out in their letter of authorisation as well as any DWA or SANRAL authorisation and standard conditions.
- e) The consulting engineer shall be responsible to ensure that proper monitoring in terms of the DEDEAT, DWA and SANRAL authorisations is carried out in terms of the respective specifications. An independent environmental control officer (ECO) should be appointed to undertake the environmental monitoring and reporting.
- f) The contractor when appointed is required by the OH&S Act to submit an OH&S plan for approval before construction commences. The applicant and Consulting Engineer are responsible to ensure that all OH&S aspects are complied with.

## **7. TIME PERIODS WITHIN WHICH THE MEASURES CONTEMPLATED IN THE ENVIRONMENTAL MANAGEMENT PLAN MUST BE IMPLEMENTED**

All measures contemplated in this environmental specification shall be completed by the end of the contract period, which normally includes a contractual maintenance period of twelve (12) months commencing after completion of the project.

## **8. PROPOSED MECHANISMS FOR MONITORING COMPLIANCE WITH THE ENVIRONMENTAL MANAGEMENT PLAN AND REPORTING THEREON**

Monitoring of all the environmental management measures and components should be carried out to ensure that the provisions of the EMP, the Basic Assessment Report and the DEDEAT authorisation are adhered to and should be carried out by an independent environmental control officer (ECO). These reports are to be submitted to DEDEAT within fourteen (14) days of each inspection. Any deviations to the approved authorisation are to be requested in writing to DEDEAT, allowing at least twenty one days for approval.

In addition visual inspections on erosion and pollution shall be carried out by the consulting engineer during each supervision inspection.

It is recommended that the scope of work for the Environmental Control Officer (ECO) include the following:

- Monthly during construction
- Two weeks prior to the practical completion of the Works in order to assist the engineer in compiling the “snag” list in relation to environmental issues
- Three weeks before the expiry of the contractual 12-month maintenance period before the release of the contractual retention moneys
- Compilation of a close out report.

## **9. COMPLIANCE AND PENALTIES**

### **9.1 Compliance**

Environmental management is concerned not only with the final results of the Contractor's operations to carry out the Works but also with the control of how those operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standard of the day-to-day operations required to complete the Works.

It is thus required that the Contractor shall comply with the environmental requirements on an ongoing basis and any failure on his part to do so will entitle the Engineer to certify the imposition of a penalty as may be set out in the Contract Documentation.

### **9.2 Penalties**

Penalties will be issued for certain transgressions. Penalties may be issued per incident at the discretion of the Engineer as listed in the Project Specifications. Such penalties will be issued in addition to any remedial costs incurred as a result of non-compliance with this Specification. The Engineer will inform the Contractor of the contravention and the amount of the penalty, and shall be entitled to deduct the amount from monies due under the Contract. Penalties will be as set out in the Contract Documentation.

## **10. MEASUREMENT AND PAYMENT**

### **10.1 Basic Principles**

Except as specified below or in the Project Specification or as Scheduled, no separate measurement and payment will be made to cover the costs of complying with the provisions of this Specification and EMPr and such costs shall be deemed to be covered by the rates tendered for the items in the Schedule of Quantities completed by the Contractor when submitting his tender.

### **10.2 Scheduled Items**

#### **10.2.1 All Requirements of the Environmental Management Specification**

The tendered rate shall cover any cost associated with complying with the environmental management specification and shall include for all materials, labour and plant required to execute and complete the work as specified, described in the Schedule of Quantities or shown on the drawing(s).

#### **10.2.2 Method Statements: Additional Work**

No separate measurement and payment will be made for the provision of Method Statements but, where the Engineer requires a change on the basis of his opinion that the proposal may result in, or carries a greater than warranted risk of damage to the environment in excess of that warranted by the

Specifications, then any additional work required, provided it could not reasonably have been foreseen by an experienced contractor, shall be valued in accordance with GCC 2010 Clause 6.4.

### **10.2.3 Work “Required By The Project Specification”**

Where a Clause in this Specification includes a requirement as “required by the Project Specification”, measurement and payment for compliance with that requirement shall be in accordance with the relevant measurement and payment Clause of the Project Specification.

## **11. PROJECT SPECIFICATION: ENVIRONMENTAL MANAGEMENT**

### **PSEM1 SCOPE**

The general principles contained within the SPEC EM shall apply to all construction activities. All construction activities shall thus observe and obey any other relevant environmental legislation and in so doing undertaken in such a manner as to minimise impacts on the 1-in-100 year flood zone, wetland, fauna and flora, the public and local residents. The size of the construction areas shall be minimised and all areas disturbed during construction shall be re-instated.

### **PSEM3 MATERIALS**

#### **PSEM3-1 Materials handling, use and storage (Sub-Clause 3.1)**

Imported materials shall be free of weeds, litter and contaminants. Any imported topsoil/material used shall be free of alien invasive plant seed.

#### **PSEM3-2 Herbicides and Pesticides (Sub-Clause 3.2)**

The use of herbicides and pesticides must be carefully controlled and manufacturers’ specifications regarding applications rates, storage and safety precautions shall be strictly adhered to. Glyphosate based herbicides shall not be used within 50m of any watercourse. Unused chemicals shall not be disposed of on site, but shall be taken to a licensed waste site. All pesticides and herbicides shall be approved by the Engineer prior to use on site.

### **PSEM4 PLANT**

#### **PSEM4-1 Power Provision**

The Contractor shall take cognisance of regular power outages in the area and ensure that adequate provision has been made to ensure that no environmental incident occurs as a result of a power outage interrupting his operations.

#### **PSEM4-2 Contaminated Water (Sub-Clause 4.4)**

The Contractor shall prevent the discharge of water contaminated with any pollutants, into any stream, watercourse or storm-water channel. Water that has been contaminated with suspended solids and silt may only be released into the natural watercourse or storm-water channels once all suspended solids have been removed from the water prior to being discharged, by settling out the solids in settling ponds.

#### **PSEM4-3 Fuel (Petrol and Diesel) and Oil (Sub-Clause 4.6)**

The contractor shall notify the regional Department of Water Affairs of any fuel or hydrocarbon spills into any watercourse.

#### **PSEM5-1 Method Statements** (Sub-Clause 5.1)

Additional Method statements to be provided by the Contractor within 7 (Seven) days of the Engineer requesting them, and prior to the activity covered by the Method Statement being undertaken, shall include:

- a) Emergency procedures for accidental leak, spillage or overflow of raw sewage, semi-treated sewage, sludge of effluent. This Method Statement shall include the following:
  - A comprehensive list of available equipment in the event of a spill;
  - The location of all emergency equipment;
  - The individual(s) responsible for the upkeep and maintenance of the emergency equipment;
  - An indication of how regularly the emergency equipment will be checked to ensure that it is in working order;
  - The location of any and all temporary emergency storage areas; and
  - The size of spillage which the emergency procedures could contain.
- b) Method of construction and emergency procedures for undertaking construction in the vicinity of or the physical intersection with known / unknown services.
- c) Method of clearing the working area, outlining extent of area to be cleared, method of clearing and all preparations required to ensure that exposed areas are minimized and stabilized as rapidly as possible.
- d) Method of blasting, including details of measures to be taken when blasting near power lines and in the vicinity of structures, methods of dealing with water ingress due to fissuring of rock as well as method of disposal of spent explosives / charges / cartridges.

#### **PSEM5-2 “No Go” Areas** (Sub-Clause 5.5 and 5.6)

The Contractor shall restrict his activities to the existing gravel road. Notwithstanding the general degraded nature of the receiving environment, any areas outside of this corridor shall be considered as “No Go” areas. Once construction within an area has been completed and the area has been rehabilitated and re-vegetated, it shall be considered a “No Go” area until establishment of introduced vegetation is confirmed.

#### **PSEM5-3 Community Relations** (Sub-Clause 5.10)

Public Information Boards shall be erected adjacent to the entrance as well as at the end of the project area. The A0 poster to be placed on the information boards will be supplied to the Contractor. The Contractor shall mount the poster on a 0.6mm white chromodek backing with a 50mm by 50mm by 1.6mm square tube frame. This frame shall be mounted on a 100mm diameter wooden pole, 1.5m above the ground as directed by the Engineer. The Contractor shall be responsible for making up and erecting the information boards at the locations indicated above and for maintaining them to the satisfaction of the Engineer. The Public Information Boards will include the Contractors Cell phone number to facilitate complaints / queries by members of the public. The Contractor shall inform the engineer of his Cell phone number prior to the Commencement Date to facilitate its inclusion on the Public Information Boards. The Contractor shall recognise that the Working Area is situated close to residential and commercial areas and shall therefore take all reasonable measures to ensure the safety of people in the surrounding area, to the extent that it is visible to the public. The construction camp shall be kept neat and clean at all times.

**PSEM5-4 Erosion and Sedimentation Control** (Sub-Clause 5.16)

The works should be phased, and development staged so that stripped areas are kept to a minimum to avoid erosion.

**PSEM5-5 Cement and Concrete Batching and Casting** (Sub-Clause 5.7)

The batch plant shall be located in an area, approved by the Engineer, no closer than 20m to any watercourse. All runoff from batching areas shall be strictly controlled and shall not enter any water body. Contaminated water storage facilities shall not be allowed to overflow and appropriate protection from rain and flooding shall be implemented. Contamination of watercourses and the surrounding environment shall be prevented when casting in the vicinity of any water body.

**PSEM5-6 Spoil Material**

The Contractor shall spoil all rock material at approved sites as, in areas indicated and approved by the Engineer. All other unsuitable material shall be removed from site and be disposed of at a location approved by the Engineer.

**PSEM5-7 Disturbance to Users**

The Contractor shall take measures to reduce disruption to users of the area in particular cognisance should be taken of the residencies adjacent to the project area.

**PSEM5-8 Excavations**

The Contractor shall take cognisance of the ingress of water in deep excavations and undertake all dewatering activities in terms of the Project Specification.

**PSEM5-9 Access and Traffic Safety**

The Contractor shall ensure that all vehicles remain on assigned access roads. Heavy vehicles shall exercise caution when entering and exiting public roads and thoroughfares. Dampening of gravel access roads may be necessary to control dust. The Contractor shall consider the movements of residents and livestock in the vicinity and exercise caution when undertaking operations in the area. Traffic control measures are to be implemented.

**PSEM5-10 Alien Vegetation Control**

The Contractor shall implement a programme to control the alien vegetation in the vicinity of the works. Alien vegetation shall be cleared by cutting the plants off at ground level, and painting the stump with 0.5% Garlon in diesel, except in the vicinity of watercourses, where Garlon is prohibited. Alternative chemical treatment, approved by the Engineer, shall be considered when working near watercourses.

**PSEM5-11 Protection of Archaeological and Paleontological Remains** (Sub-Clause 5-13)

Temporary conservation measures (barricading with safety net shall suffice) must be erected around the following identified points as described hereunder.

- RPM1 – Iron Age / Contemporary Period - Cemetery - S33 01'36.9" and E26 58'40.9"
- RPM3 – Colonial Period – Farmstead Remains and associated infrastructure including feeding troughs, cattle ramps and other structures - S33 01'52.4" and E26 58'55.7"

RPM2 – Colonial Period – Ripplemead Pack House - S33 01'50.7"; E26 58'52.0" – shall be conserved with continued use as at present. Conservation of Site RPM2 accommodates continued use of the structure itself as well as machinery, many of which can be classed as 'heritage objects'. The developer and farmers are reminded that future alteration to the pack house would need to be done under an EC PHRA Built Environment Unit permit.



Localities of Sites RPM1-3 in relation to the Ripplemead Pack House study site

Should any palaeontological, archaeological or cultural heritage resources, including human remains / graves, as defined and protected by the NHRA 1999, be identified during the construction phase of development (including as a norm during vegetation clearing, surface scraping, trenching and excavation phases), it is recommended that the process described below be followed.

➤ **On-site Reporting Process:**

1. The identifier should immediately notify his / her supervisor of the find.
2. The identifier's supervisor should immediately (and within 24 hours after reporting by the identifier) report the incident to the on-site SHE officer.
3. The on-site SHE officer should immediately (and within 24 hours after reporting by the relevant supervisor) report the incident to the appointed ECO. [Should the find relate to human remains the SHE officer should immediately notify the nearest SAPS station informing them of the find].
4. The ECO officer should ensure that the find is within 72 hours after the SHE officer's report reported on SAHRIS and that a relevant heritage specialist is contacted to make arrangements for a heritage site inspection. [Should the find relate to human remains the ECO / CLO officer should ensure that the archaeological site inspection coincides with a SAPS site inspection, to verify if the find is of forensic, authentic (informal / older than 60 years), or archaeological (older than 100 years) origin].

5. The appointed heritage specialist should compile a 'heritage site inspection' report based on the site specific findings. The site inspection report should make recommendations for the destruction, conservation or mitigation of the find and prescribe a recommended way forward for development. The 'heritage site inspection' report should be submitted to the ECO / CLO, who should ensure submission thereof on SAHRIS.
6. SAHRA / the relevant PHRA will state legal requirements for development to proceed in the SAHRA / PHRA Comment on the 'heritage site inspection' report.
7. The developer should proceed with implementation of the SAHRA / PHRA Comment requirements. SAHRA / PHRA Comment requirements may well stipulate permit specifications for development to proceed.
  - Should permit specifications stipulate further Phase 2 archaeological investigation (including grave mitigation) a suitably accredited heritage specialist should be appointed to conduct the work according to the applicable SAHRA / PHRA process. The heritage specialist should apply for the permit. Upon issue of the SAHRA / PHRA permit the Phase 2 heritage mitigation program may commence.
  - Should permit specifications stipulate destruction of the find under a SAHRA / PHRA permit the developer should immediately proceed with the permit application. Upon the issue of the SAHRA / PHRA permit the developer may legally proceed with destruction of the palaeontological, archaeological or cultural heritage resource.
  - Upon completion of the Phase 2 heritage mitigation program the heritage specialist will submit a Phase 2 report to the ECO / CLO, who should in turn ensure submission thereof on SAHRIS. Report recommendations may include that the remainder of a heritage site be destroyed under a SAHRA / PHRA permit.
  - Should the find relate to human remains of forensic origin the matter will be directly addressed by the SAPS: A SAHRA / PHRA permit will not be applicable.

**NOTE:** Note that SAHRA / PHRA permit and process requirements relating to the mitigation of human remains requires suitable advertising of the find, a consultation, mitigation and re-internment / deposition process. The process shall be dealt with by the specialist who compiled the HIA, namely in this case ArchaeoMaps Archaeological Consultancy.

➤ **Duties of the Supervisor:**

1. The supervisor should immediately upon reporting by the identifier ensure that all work in the vicinity of the find is ceased.
2. The supervisor should ensure that the location of the find is immediately secured (and within 12 hours of reporting by the identifier), by means of a temporary conservation fence (construction netting) allowing for a 5-10m heritage conservation buffer zone around the find. The temporary conserved area should be sign-posted as a '*No Entry – Heritage Site*' zone.
3. Where development has impacted on the resource, no attempt should be made to remove artefacts / objects / remains further from their context, and artefacts / objects / remains that have been removed should be collected and placed within the conservation area or kept for safekeeping with the SHE Q officer. It is imperative that where development has impacted on palaeontological, archaeological and cultural heritage resources the context of the find be preserved as good as possible for interpretive and sample testing purposes.
4. The supervisor should record the name, company and capacity of the identifier and compile a brief report describing the events surrounding the find. The report should be submitted to the SHE officer at the time of the incident report.



➤ **Duties of the Developer / Construction Consultant:**

The developer / construction consultant should ensure that an adequate heritage contingency budget is accommodated within the project budget to facilitate and streamline the heritage compliance process in the event of identification of incidental palaeontological, archaeological and cultural heritage resources during the course of development, including as a norm during vegetation clearing, surface scraping, trenching and excavation phases, when resources not visible at the time of the surface assessment may well be exposed.

**PSEM6 TOLERANCES**

**PSEM6-1 Fines**

The Engineer may impose fines for the activities detailed below on the Contractor and/or his/her Sub-contractors.

No.	Action	Fine (R)
a	Any employees, vehicles, plant, or thing related to the Contractor's operations operating within the designated boundaries of a "no-go" area including the 1-in-100 year flood zone and wetland except for work undertaken in Hudson Street	R 10 000
b	Any vehicle driving in excess of designated speed limits	R 1 000
c	Persistent and un-repaired oil leaks from machinery	R 2 000
d	Persistent failure to monitor and empty drip trays timeously	R 2 000
e	The use of inappropriate methods for refuelling	R 2 000
f	Persistent failure to carry out concrete mixing on bare ground and not on a tray or method approved by the Engineer	R 2 000
g	Litter on site associated with construction activities	R 2 000
h	Deliberate lighting of illegal fires on site	R 2 000
i	Chemical toilets not provided or employees not making use of the site ablution facilities	R 2 000
j	Failure to implement specified noise controls, particularly during blasting	R 2 000
k	Failure to empty waste bins on a regular basis and at an approved site	R 1 000
l	Inadequate dust control	R 2 000
m	Removal or damage by any means to any flora (plant, tree or <i>Aloe</i> ) without an authorisation or permit where necessary – fine imposed per plant, tree or <i>Aloe</i>	R 1 000
n	A spillage, pollution, fire or any damage to any watercourse resulting from negligence on the part of a Contractor and/or Sub-contractor	R 10 000

For each subsequent and similar offence, the fine shall be doubled in value to a maximum value of R30,000 (Thirty thousand Rand). The Engineer shall be the judge as to what constitutes a transgression in terms of this clause, subject to the provisions of Clause 60(1) of the General Conditions of Contract. In the event that transgressions continue the Contractor's attention is drawn to the provisions of Sub-clause 58(1)(b)(vi) of the General Conditions of Contract under which the Engineer may cancel the Contract.

**PSEM8 MEASUREMENT AND PAYMENT**

**PSEM9-1 All requirements of the environmental management specifications**

All work not measured elsewhere, associated with complying with any requirement of the environmental management specification shall be measured as a sum. The tendered rate shall cover any cost associated with complying with the environmental management specification and shall include for all materials, labour and plant required to execute and complete the work as specified, described in the Schedule of Quantities or shown on the drawing(s).

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