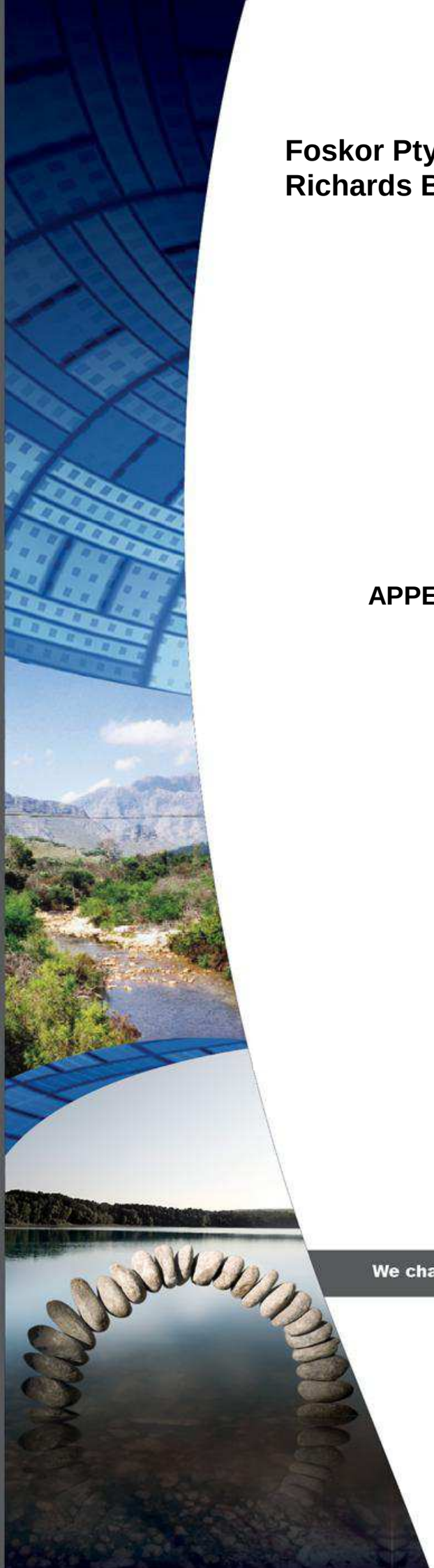

Foskor Pty Limited
Richards Bay

APPENDIX F IMPACT ASSESSMENT

October 2012
J31280

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1 INTRODUCTION

The purpose of this section is to describe and assess the potential impacts that may arise as a result of the construction and operation of the Rock Phosphate Storage Facility and to recommend associated and appropriate mitigation measures. These impacts include potential biophysical impacts and impacts on the human environment, which have been identified for the project.

After the potential impacts relating to the project are identified, it is necessary to evaluate how the impact will affect the surrounding environment. The potential impact can then be assessed in order to determine its significance and to define mitigation measures or management measures to address the impact.

Environmental impacts can be defined as the consequences of an activity on environmental resources and the environmental impacts relating to the rock phosphate storage facility refer to biophysical, socio-economic, visual and cultural aspects. Significant impacts can lead to drastic changes in the *status quo* of the environment which can be direct, indirect or cumulative. Direct impacts are changes that result from direct interactions between the environment and project activities. Indirect impacts result from interactions between the environment and direct impacts. Cumulative impacts are an accumulation of changes to the environment caused by project activities.

Once a potential impact has been identified, it is necessary to assess the impact in terms of the significance of the impact. This will provide an indication as to how the impact must be managed, mitigated and monitored.

2 BIOPHYSICAL IMPACTS

2.1 Soil Erosion and Sedimentation

a) Environmental Overview

The proposed site for the rock phosphate storage facility is located on Portions 55 & 56 of Erf 5333 in Richards Bay. This land is currently undeveloped and fully vegetated. However, channels traverse the site which reportedly had been excavated as part of the prior road construction activities to redirect storm water away from the neighbouring John Ross highway. Plants have overgrown these manmade channels, which benefit the recharge of groundwater from the diverted storm water and reduces the storm water flowrate into the wetland during ‘normal’ rainfall events. It is questionable whether the vegetation would offer much storm water flow rate attenuation during high storm events as the force of the water may simply flatten the vegetation. Nevertheless, the lower flows reduce the influence of scour and erosion in the wetland and there is therefore currently little potential for soil erosion to occur. According to the Wetland Mitigation and Off-set Assessment Report by Mullins, 2010 there are “limited clastic imports or exports”, and these isolating impacts have cut this system off from sediment supply.

b) Potential Impact

During the construction phase of a development, earth grading for site preparation, removal of vegetation cover and keeping of soil stockpiles can leave surfaces uncovered and unprotected which may facilitate erosion and sedimentation. The sourcing and use of construction materials, for example soils, sand aggregate and concrete is a direct impact to the site particularly since there are two wetland systems on the site. There may also be a potential for siltation of downstream wetlands due to erosion of exposed soils and material stockpiles. Rain and wind dislodge soil particles from exposed soils and construction stockpiles of sand which are then carried away may also be deposited in storm water channels, streams or wetlands, thereby contributing to sedimentation of water resources. This may be exacerbated in vehicle tracks from construction vehicles where rain water may scour the tracks leading to rill erosion.

The storm water drainage system in the form of an open channel along the eastern boundary of the site will direct storm water to an inlet point at the southern wetland on Ptn 57. The system will redirect storm water flowing from a north eastern direction around the proposed site. This drainage channel will be provided with a permeable floor and an energy dissipating structure at the inlet to the wetland (gabion soakaway basket).

Mr Mullins, the wetland specialist recommended that this system include a notched weir / berm system down the length of the drain. The aim of this is to retard or hold runoff at points higher up the system to allow more opportunity to infiltrate. This will mean the volume of water eventually reaching the dissipation structure (and single point discharge) on the edge of Ptn 57 will be less (i.e. more similar to natural levels.). A second function will be the removal of any pollutants from the runoff as there is no control over the water quality entering the site. Therefore the water is ‘treated’ higher up the system, which increases the residence time in the artificial portion of the system prior to its release into the Ptn 57 system – this will be more ecologically sound.

During the operation phase of the rock phosphate storage facility the potential for soil erosion will increase during high rainfall events particularly at storm water discharge points and other potential point sources. It is therefore vital that the design of the facility and associated storm water management system reduces large discharge points and includes measures to reduce the speed of the runoff and the potential for erosion and scour. Sedimentation may also be controlled through the use of “green” erosion control structures which promote infiltration and sediment settling.

Soil erosion removes the nutrient rich topsoil first and once this is depleted few plants will grow in the soil (cumulative impact). Due to the location of the proposed development there is a high risk that the extent of any soil erosion will be significant enough for the above conditions to occur particularly within the wetland systems.

Should decommissioning activities include demolition and site clearing, erosion and sedimentation impacts resulting from such activities will be similar to those associated with construction activities.

c) Mitigation Measures

The following mitigation measures are applicable to potential soil erosion and sedimentation issues during construction and operation of the rock phosphate storage facility:

- Minimise the area to be cleared and keep as much of the area surrounding the bunker and infrastructure vegetated (preferably retain indigenous vegetation). Most importantly maximise the buffer/'no-go' area surrounding the southern wetland
- Demarcate the no-go areas
- Sediment traps should be put into place and should be serviced regularly and kept clean and functioning optimally
- Implement erosion control measures when removing vegetation
- Locate the construction camp within the infrastructure footprint, where reasonably feasible, thus thereby avoiding direct impact outside this footprint
- Locate the construction camp (and laydown areas) outside the 32m buffer of the southern wetland
- Develop a Storm water Management Plan for the construction, operational and decommissioning phases that includes appropriate measures for the prevention/minimisation of erosion and sedimentation at all times (refer to **Subsection 2.3** for further detail)
- The storm water drainage network must be kept separate from the effluent/sewer system
- These networks must be designed and constructed in such a manner that storm water of a suitable quality will drain into the surrounding system.
- Implement energy dissipating measures in the storm water drainage channels that lead to the wetland (in accordance with the recommendations provided by the wetland specialist.)
- Implement erosion control measures in areas sensitive to erosion such as near water supply points, on any small inclines, etc. - measures could include the use of sand bags, hessian sheets, retention or replacement of vegetation
- Protect areas susceptible to erosion by installing temporary and/or permanent drainage works
- Keep soil and sand stockpiles outside the 1 in 100 year flood lines
- Minimise erosion by reducing the flow velocity of storm water
- Stabilise and manage cleared areas to prevent and control erosion
- After construction any disturbed areas should be graded and revegetated to promote the infiltration of runoff and reduce the amount of sediment reaching the streams and wetlands

- Drainage must be controlled to ensure that runoff from the site will not culminate in off-site pollution or cause water damage to properties and the wetland systems further down from the site.
- Ensure that firstly no mixing of ‘clean’ and ‘dirty’ runoff may occur and certainly no ‘dirty’ runoff may enter any natural system
- The Storm water Management Plan should ensure that the ultimate flow from the development does not result in any negative impacts on downstream properties or wetlands/watercourses and must therefore ensure that storm water is managed within the overall site as effectively as possible.
- Capture storm water effectively and direct well away from all structures
- Prevent ponding of surface water adjacent to foundations both during and after construction
- Over land flows and point releases should be avoided or at least minimised
- Install small erosion control measures on construction vehicle roads to eliminate the potential for scour and erosion in the vehicle tracks
- Opportunities for infiltration across the site should be made rather than to direct all runoff to large discharge points. Run off therefore needs to be attenuated and managed on the site itself.
- Ensure storm water controls are implemented into the design of the rock phosphate storage facility

d) Impact Significance

Soil erosion occurring as a result of construction activities during the construction phase will have a temporary impact on the environment, relative to the life of construction. Thereafter the impacts on these processes will be removed and the soil erosion occurring will be reduced. However, due to the nature of the site, impacts on the soil are expected to be significant and soil erosion problems are likely without mitigation.

During the operational phase, some previously vegetated areas may be hard surfaced, which could increase the rate of runoff and in turn could result in accelerated soil erosion of surrounding exposed areas. As mentioned, the site is located in a sensitive wetland environment and the impact on soils is likely to be significant, however the design of the rock phosphate storage building and associated storm water infrastructure will include “green” erosion control measures to reduce the speed of the runoff from the hard surfaced areas therefore reducing the potential for scour and erosion. This will allow any sediment run off to be controlled and directed via the new storm water system. Measures will also be implemented in the design of the building to reduce runoff from point sources and promote the slow infiltration of water.

Construction:

The potential impact of soil erosion and sedimentation resulting from construction activities are considered to be of **moderate significance without mitigation.**

However, the potential impact will be substantially reduced returning a **low significance with mitigation.**

Operation:

The potential impact of soil erosion and sedimentation occurring during the operation of the rock phosphate storage facility is considered to be of **moderate significance without mitigation.**

This potential impact will be reduced to a **low significance with mitigation.**

2.2 Soil and Water Resource Contamination

a) **Environmental Overview**

Refer to **Subsection 2.1 (a)** and **Subsection 2.3 (a)** for an overview of the soil and water resource environment of the proposed property on which the development will occur. The risk of soil and water resource contamination on the proposed property may potentially be significant given the sensitive wetland environment. However effective management and preventative measures will reduce the significance of any contamination risks.

b) **Potential Impact**

A potential for contamination of soils and ground and surface water resources during the construction, operational and decommissioning phase of the Rock Phosphate Storage Project as a result of poor or improper management of, use, storage or disposal of hazardous substances, such as lubricating oil, fuel and cement may occur. During construction and operation any pollutant spilled onto the soil has the potential to leach into the soil and eventually contaminate groundwater and surface water sources. Surface water contamination can also occur through spilled pollutants contaminating storm water and/or draining directly into storm water drains and waterways.

Extraction of water and the discharge of wastewater and contaminated water also have the potential to impact groundwater and surface water resources. Solid waste material generated during construction and operation may also cause soil and water resource contamination and pollution through litter if not correctly managed and/or disposed of.

During both the construction and operational phase, any hazardous substances that are spilled onto the ground and not cleaned up can leach into the soil causing soil and water contamination. This can have significant consequences for local ecosystems and particularly the wetland system located further downstream on Portion 57. Even small amounts of contaminate can alter the soil chemistry and affect the delicate microorganisms and plant species that reside in the soil environment. With relation to this project the only risk of soil contamination to the area is from oil

or any other hazardous materials that will be stored on the site and their potential to spill.

Pollutants entering surface or groundwater environments can alter the water chemistry, which in turn affects organisms and plants that live in these water bodies. The effect of this can be damaging to individual species and populations and, if severe, to entire ecosystems. See further impacts on fauna and flora in **Section 2.4 (b) and (c)** above. In addition the contamination of water sources can pollute drinking water which could be detrimental to humans.

In the context of the rock phosphate storage facility project, cases of accidental spills may increase during the construction phase due to materials being used and stored on the site. Given the nature of the site, this could be detrimental to the water quality of wetland systems and ultimately the systems further downstream.

c) **Mitigation Measures**

Good environmental management practices must be followed to prevent potential contamination of soil and water resources resulting from the proposed Rock Phosphate Storage Facility Project.

Hazardous Substances Management

Mitigation measures that will be incorporated in the design of the facility include the following:

- The transformers would be housed in a bunded area
- A small bunded store will be provided for storage and containment of all hazardous materials (including lubricating oil, paint tins etc) such as would be used for operation and maintenance activities.

Typical mitigation measures should include the following:

- Include a requirement in the tender contract for the contractor(s) to provide a method statement(s) for hazardous substances management during site remediation and construction and ensure that the method statement(s) be approved by the appointed ECO, and if required the Emergency Services Department and Environmental Department, prior to commencement of remediation and construction
- Solicit expert advice and or services for appropriate safe handling of any potentially toxic or hazardous substances (e.g. unidentified substances or items that could potentially be hazardous)
- Adhere to all relevant national, regional and local legislation regarding the transportation, storing, keeping, handling, use and disposal of hazardous substances and/or waste at all times
- Obtain all necessary approvals from the Emergency Services Department with respect to fuel storage and dispensing

- Obtain and ensure on-site availability of a Material Safety Data Sheet (MSDS) for every hazardous substance used for construction purposes
- Ensure that all staff handling hazardous substances are adequately informed about the specific hazards (e.g. information from MSDSs or hazard specialists), equipped with appropriate Personal Protective Equipment (PPE) and suitably trained in the handling of the specific substances and hazards
- Implement appropriate health and safety precautions to avoid employee and/or public exposure to any contaminant or hazardous substance, which in addition to hazardous substances for construction purposes may potentially include certain historically dumped wastes, spilled substances and leachate
- Minimise quantities of fuel, paints and other hazardous material kept at the construction site and ensure that they are stored in correctly bunded and covered areas
- Safeguard hazardous substances from being stolen, vandalised, catching fire or spilling on open ground
- Introduce and implement effective spill prevention, minimisation, containment, emergency and clean up measures and procedures, which include the following:

    - Locate all hazardous substances storage areas and portaloos outside the 1:100 year floodline
    - Keep a complete emergency spill kit available on site at all times and ensure that the Contractor trains all the relevant staff members in the effective use thereof for dealing with spills of hazardous substances (oils, diesel or petrol)
    - Carry out routine vehicle maintenance and washing necessary during construction at a maintenance workshop instead of at the construction site or camps to avoid on-site spills and leakages
    - Keep all mechanical equipment used in construction activities clean and free of oil, petrol, and diesel leaks
    - Avail and deploy adequately sized drip trays for all vehicles/equipment that pose a risk of leaking oil or fuel
    - Provide and keep/store all fuel, oil, paint, bitumen and other hazardous liquids in suitably designed impermeable bunded areas with a containment capacity of at least 110% of the volume of substance stored therein
    - Keep abovementioned containment bunds clean by ‘mopping’ up any spillages of any hazardous substances immediately and, either prevent rainwater from accumulating in the bund (e.g. provide a roof over the bund) or remove any rainwater to ensure the capacity of the bund is maintained
    - Store incompatible hazardous substances separately (in separate bunded areas
    - Utilise drip trays to prevent oil or fuel spills in case of on-site emergency maintenance
    - Conduct concrete batching or place ready mix on provided impermeable sheet material

  - Seal and store all empty and externally dirty containers that had contained hazardous substances in a bunded area or an area where the ground has been protected by an impermeable surface
  - Implement and adhere to appropriate and safe latrine hygiene and sewage disposal procedures
  - Compile and implement an emergency procedure to deal with accidents and incidents (e.g. spills) arising from hazardous substances which should include at least the following:
    - Stop the source of the spill as soon as possible
    - Contain the spill immediately and as effectively as possible
    - Report any significant spills immediately to the Emergency Services Department, ECO, DWA, Environmental Department and other relevant authorities
    - Follow any instructions that the abovementioned parties may give
    - Determine if there is any soil, groundwater or other environmental impact and, if so take appropriate, remedial action to the satisfaction of the ECO on the construction site and/or the Environmental Department
    - Document all spill incidents, response procedures and corrective actions on an incident register
- Ensure that maintenance, oil restocking and waste oil removal activities are undertaken in such a manner that no spillage of hazardous substances occur
- Consider making use of ready-mix concrete supply instead of installing an on-site concrete batch plant. However, should an on-site concrete batch plant be necessary, special precautions in terms of bunding; waste water capturing and treatment; and precautions against wind-blown cement would need to be implemented
- Prohibit vehicles from being washed and maintained on the construction site. Introduce appropriate waste collection and disposal procedures and facilities
- Adhere to all requirements of the Occupational Health and Safety Act and associated Regulations and any amendments thereto that are relevant for management of hazardous substances
- Water quality monitoring is to be conducted on water entering the gabion soakaway at the inlet to the southern wetland to ensure no pollutants are entering the system
- Implement the EMP which covers the abovementioned mitigation measures appropriately.

Waste Management

Typical mitigation measures should include the following:

- Introduce and implement/install appropriate waste and sewage collection and disposal procedures and facilities during construction and operation
- Dispose of all contaminated soil, excavated waste and solid waste material generated or uncovered at a permitted landfill site that is authorised to accept the particular waste
- Obtain safe waste disposal certificates for all wastes disposed and retain and keep these certificates on record for proof of appropriate disposal for at least 3 years (or alternatively in accordance with any other Municipal requirements)
- Recycle used oil, e.g. to a suitably qualified external recycler or appropriately permitted on-site used oil refinery
- Remove and/or treat any contaminated soil immediately and dispose therefore appropriately and in accordance with legal requirements

d) **Impact Significance**

Construction and Decommissioning:

The possibility of contamination may increase during the construction and decommissioning phase due to use of hazardous materials in the construction/decommissioning process. The quantities of hazardous substances stored and used on site are however likely to be small and these phases will be of relatively short duration. With implementing the appropriate mitigation measures the impacts are likely to be low.

The potential impact of soil contamination as a result of construction/decommissioning activities is therefore considered to be of **low significance without mitigation**.

This potential impact will be reduced to an **even lower significance with mitigation**.

Operation:

During the operation phase transformers will be housed in units containing stone chips and effectively bunded. All hazardous materials on site, such as lubrication oil, sealants, paint tins etc would be stored in bunded areas which would minimise the risks of spillage occurring during.

The potential impact of soil contamination during the operational phase is therefore considered to be of **moderate significance without mitigation**.

However, this potential impact will be reduced to a **low significance with mitigation**.

2.3 Hydrology, Drainage and Wetlands

a) Environmental Overview

The site has a high water table and is characterised by wetland systems.

According to Mullins, 2010 there are two wetlands systems located on Portion 55 & 56 (the proposed development sites for the rock phosphate storage facility), which are referred to as the 'northern wetland' and the 'southern wetland'. Both wetland systems have been significantly impacted on by the construction of the Hillside Smelter complex and the John Ross Highway. (Mullins, 2010).

The northern wetland forms part of a larger system cut-off by the construction of the John Ross Highway. The system has been moderately disturbed and features a series of drains and channels cut to remove water from the vicinity of the freeway. This system has a moderate species diversity but it has been drained and inflow to the system altered. The system has therefore lost much of its functionality (Mullins, 2010).

The southern wetland overlaps the southern boundary of the site and continues on the neighbouring Portion 57. This wetland forms the northern portion of a much larger wetland to the south of the development property. This wetland receives surface runoff from the surrounding areas as well as via an excavated channel traversing Portion 55 & 56 to remove storm water from the Hillside Smelter site and conveyor servitude. The southern wetland system has also been disturbed in the past but still maintains a decent functionality, is in good condition and has not been impacted to any significant degree. (Mullins, 2010) According to Ms Elliott of Ezemvelo KZN Wildlife, the southern wetland system forms part of a much larger system and it flows into swamp forest as well as the Manzanyama system and Richards Bay Harbour, both of which supports critically important biodiversity.

b) Potential Impact

As mentioned, the proposed bunker will infringe substantially on the small northern wetland, resulting in wetland loss; and infringe slightly on the 40m buffer zone of the southern wetland. Furthermore, the mentioned road access to the site will cross a small portion of the southern wetland, resulting in further loss, but it will be constructed at the edge of the wetland as close as possible to the eastern boundary of the property. Overall the loss of wetland area is small, only approximately 0.055 hectares.

The extensive development that had occurred in the Richards Bay in or near former wetland areas resulted in a significant cumulative impact on wetland habitats to the point where much of the valuable wetland function has already been lost. Although the loss of wetland for this specific site is relatively small, it does contribute to the cumulative loss of wetland in the area.

Once the rock phosphate storage facility is constructed, previously vegetated areas will be covered by a hardstanding surface which could result in increased runoff rate of storm water and loss of groundwater recharge. The proposed site will directly affect drainage lines and the wetlands therefore poorly managed storm water could affect the environment in several ways, including increasing the water flow rates entering streams. The preliminary storm water system design provides for a new open channel along the eastern boundary of the site to divert the storm water flowing from a north eastern direction via the current channel that traverses the site to another inlet point at the southern wetland on Portion 57.

Modifications of both surface and groundwater flows in turn may impact aquatic systems in terms of their natural hydrological flow regimes. The flow in rivers is driven by the natural hydrograph response to surface and groundwater flows. Run-off from hard surfaced areas especially during peak storm flows can cause unnaturally high water contributions to streams and wetlands. This is particularly problematic where runoff discharges directly into aquatic systems. The contribution of additional quantities of surface runoff over a much shorter period of time exacerbates the issues attributed to physical damage to aquatic ecosystems, i.e. increased erosion, sedimentation and damage to vegetation.

c) Mitigation Measures

Storm water will be managed primarily by the facility storm water drainage system and other wetland impact mitigation measures included in the design of the project. Based on the recommendations from Ezemvelo KZN Wildlife, GIBB coordinated a meeting between Bosch Project's design engineers, Foskor's project manager and Mr Greg Mullins, Sivest's wetland specialist to discuss suitable design features that would suitably mitigate wetland impact. During this meeting which was held on 4 June 2012 it was agreed to include the following mitigation measures into the design:

- The bunker will be constructed on concrete pilons driven or poured into the ground, which will therefore not restrict the underground movement of water
- The new eastern drainage channel will be provided with a permeable floor, energy dissipating features along the route of the channel and an energy dissipating structure at the inlet to the southern wetland.
- The storm water culvert under the road will be a box culvert type provided with a permeable floor
- The base of the access road that traverses a small portion of the southern wetland will be broken rock rather than soil infill to allow water to permeate more freely
- The roof of the bunker will not be provided with gutter, but rainwater will fall off the roof into a trench filled with rock surrounding the building. This is to allow the water to recharge the groundwater and wetlands. This return of water into the local water table will in turn feed the southern system via indirect inputs

- A ‘first flush catch pit’ will be provided at the outlet of the storm water system for the parking area to contain sediments and contaminants and prevent these from spilling into the southern wetland
- Where feasible, the designs would also include more natural free runoff, particularly from areas that will remain undeveloped.

In addition typical mitigation measures should include:

- See **Subsection 2.1 (c)** for detailed storm water mitigation measures
- See **Subsection 2.2 (c)** for detail of soil and water resource contamination mitigation
- Develop a storm water management plan for the construction and operational phase of the project and submit this plan for approval to the Municipality Water Services Department and DWA.
- Locate the construction camps away from surface water bodies and wetlands
- Limit activities to 32 m from the edge of the wetlands except for road culverts
- Prohibit activities such as temporary housing, temporary ablution, disturbance of natural habitat, storing of equipment or any other use of the buffer zone (32m).
- Plan construction to minimise impact on the natural drainage of the site and wetland functionality.
- Develop and implement a rehabilitation and conservation plan for the southern wetland on Portion 57.

d) Impact Significance

While it should be noted that the site hydrological regime has already been significantly impacted by human activities, the proposed rock phosphate storage facility will contribute to this cumulative impact, particularly through increase of hardsurfaces and associated reduction of the area available for storm water to recharge the groundwater. However, the described design and site management measures would minimise this impact, most notably the implementation of features that would allow storm water falling on the site to recharge the groundwater or be directed to the southern wetland.

Construction and Decommissioning:

The potential impact on hydrology, drainage and wetland systems as a result of construction/decommissioning activities is therefore considered to be of **moderate significance without mitigation**.

This potential impact will be reduced to a **low significance with mitigation**.

Operation:
The potential impact on hydrology, drainage and wetland systems during the operation phase is therefore considered to be of **moderate significance without mitigation**.

This potential impact will be reduced to a **low significance with mitigation**.

2.4 Flora

a) Environmental Overview

As already mentioned above, the site contains two wetland systems, the northern wetland system and the much larger southern wetland system. The property therefore contains a mixture of intact and disturbed habitats. Based on the study by Mullins, 2010, the site consists of primarily mixed grassland and open bushveld, and some portions of the site contain exotic plantations.

b) Potential Impact

Construction of the rock phosphate storage facility will result in vegetation being cleared from the site and activities can damage vegetation species. The proposed site will also impact on the Northern wetland system and a portion of the wetland in the south. Construction staff can cause damage to vegetation by entering no-go zones and there is a potential for veld fires. Invasive Alien Plants are found to increase in the disturbed ground of a construction area and if left unmanaged these species can invade adjacent sites killing off indigenous vegetation. If a control plan is put into place as soon as construction starts, it would have the effect of controlling any future invasions due to construction as well as removing current infestations.

c) Mitigation Measures

- All alien vegetation occurring on the properties must be removed and an alien management plan instituted to prevent re-infestations
- Should any landscaping around the proposed development be undertaken, where possible it must be in keeping with the status quo and all plants utilised in any re-planting exercises should be sourced from around the Richards Bay area
- All plants must be indigenous and endemic to the Richards Bay area
- Areas that are not to be developed must be clearly demarcated and must be specified in all contractual documentation as “no-go” areas for any construction related activities.

d) Impact Significance

Due to the nature of the site there may be some sensitive vegetation present. It is not anticipated that any rare or endangered vegetation would be affected by the normal construction or operational activities.

Construction and Decommissioning:

The potential impact on vegetation during construction is considered to be of **moderate significance without mitigation** due to the nature of the site and surrounding areas.

This potential impact will be reduced to a **low significance with mitigation**.

Operation:

The potential impact on vegetation during the operational phase is considered to be of **low significance without mitigation** due to the nature of the proposed activity.

This potential impact will be reduced to an **even lower significance with mitigation**.

2.5 Fauna

a) Environmental Overview

The industrial nature of the area restricts the existence of large faunal species on the proposed sites. The surrounding wetland areas are inhabited by various amphibian, small reptiles, small mammals, birds and insect species

No faunal species of significance were observed at the proposed site.

b) Potential Impact

Given the fact the portions of the wetland systems will be lost; there will be a loss of habitat. , Because the rock phosphate would be housed in a closed building or containerised unit, faunal access would be restricted during the operational phase. There is however the potential for bird nesting and rodent infestation.

Mammals, reptiles and small bird species may be impacted during construction, particularly those that are nesting/breeding at the time. Most species are however likely to move away from the construction site into the surrounding wetland habitats once the activities an noise associated with constructions becomes evident. Thus it is unlikely that they would suffer any long-term effect. Poor waste management during the construction phase can potentially increase rodent infestation.

c) Mitigation Measures

- Prohibit construction workers from poaching, hunting or fishing during working hours
- Remove any faunal species that may shelter or nest at the site or that may stray onto site in a humane manner
- Ensure that waste bins are kept tidy and that waste is removed weekly to reduce any rodent infestation.

d) Impact Significance

The nature of the sites and immediate surrounding areas results in very minimal large faunal habitation. However given the two wetland systems in close proximity, smaller faunal species may still be impacted on without mitigation.

Construction and Decommissioning:

The potential impact of the activity on faunal species as a result of construction activities is considered to be of **moderate significance without mitigation** due to the nature of the site and surrounding natural areas.

This potential impact will be reduced to a **low significance with mitigation**.

Operation:

The potential impact of the activity on faunal species during the operational phase is considered to be of **moderate significance without mitigation** due to the nature of the site and surrounding areas.

This potential impact will be reduced to a **low significance with mitigation**.

2.6 Water Use

a) Environmental Overview

Within the vicinity of the proposed development is the municipal water servitude line. For the proposed rock phosphate storage facility, it is proposed to tie into this existing municipal water servitude for water use.

b) Potential Impact

The volumes of water which will be used for the proposed project during the construction phase will be small. Water use during the operational phase will be even lower as it is proposed to have a small ablution facility for use by a few employees.

Should contractors require temporary abstraction of water in excess of quantities then they would need to obtain the permission from DWA to do so. Due to the fact that the wetlands on site are ground water fed, abstraction may potentially lead to contamination of water sources. During the construction phase water use will be acquired from a connection to the municipal supply. This will be piped to a point at the edge of the property. The contractors will then need to make provision for their connection to the point where the supply is led to.

c) Mitigation Measures

The mitigation measures for protection of water resources include the recommendations for protection of soil as provided in **Subsection 2.1** to **2.3**. The following additional mitigation measures must be applied during the construction phase.

- Optimise water usage in order to minimise water and pollution of water resources
- Develop and implement storm water management plans for the construction and operational phases to ensure that all storm water collected on site is managed such that it does not get contaminated

d) Impact Significance

Construction and Decommissioning:

The potential negative impact on water use as a result of the construction phase is considered to be of **moderate significance without mitigation.**

However, this potential impact will be reduced to a **low significance with mitigation.**

Operation:

The potential negative impact on water use as a result of the operational phase is considered to be of **moderate significance without mitigation.**

However, this potential impact will be reduced to a **low significance with mitigation.**

3 Impacts on the Human Environment

3.1 Economy

a) Environmental Overview

*Refer to **Section A, Subsection 1.1, 1.2 and Section B, Subsection 8** for an overview of the economic context of Foskor.*

b) Potential Impact

As discussed in **Section A**, **Subsection 1.7,** there is a motivation with a high positive significance for this project, and as such the Project is an important component of Foskor's contribution to fertiliser demand for the economy as a whole. The Rock Phosphate Storage Facility Project has therefore economic significance in a local, regional and national economic context.

Jobs will be created during the construction phase and most of these would benefit local people.

c) Enhancement Measures

In the case of its local, regional and national significance one of the most important enhancement measures is to ensure the sustainability of this phosphorous related industry. This project has a direct implication for this sustainability.

d) Impact Significance

The potential positive impact on the economy is considered to be of **high significance without enhancement**.

3.2 Air Quality

a) Environmental Overview

Refer to **Section A, Subsection 12 (c)** for an overview of the air quality context.

b) Potential Impact

The Rock Phosphate Storage Facility Project would probably have little effect on the overall emissions released. The Storage facility will have a dust control system consisting of dust extraction points at positions where dust is likely to be generated from hoppers and conveyor transfer points. The conveyor belt will also be an enclosed conveyor. The conveyor transition points have been reduced along the designed conveyor route, as these points are known to cause high dust emission risks.

As discussed in Section A, in terms of NEM:AQA listed activity 14, category 5, subcategory 5.1, requires an application for an amendment to Foskor's existing Atmospheric Emissions License (AEL) be undertaken. The amendment required for this project will be incorporated as part of an overall AEL amendment application conducted by SRK Consulting (Pty) Ltd.

The main impact on air quality due to the construction of the proposed rock phosphate facility will result from the generation of dust during site remediation and preparation, foundation excavation and casting of foundations. Other sources of air pollution would be as a result of construction vehicles and equipment exhaust fumes, trafficking on unpaved roads (although this would be very limited), potential waste burning and potential runaway fires.

c) Mitigation Measures

The following typical mitigation measures will reduce the significance level of potential air quality impacts:

- Minimise the surface area of exposed soil and fine construction materials to wind erosion (construction phase)
- Sprinkle water on dust on exposed areas or soil mounds (e.g. from cable trenching) as and when dust problems arise (construction phase)
- Maintain vehicles and other driven machinery regularly to ensure that no smoke is emitted from exhausts (construction and operational phase)
- Prevent any uncontrolled fires (construction and operational phase)
- Prohibit burning of wastes/refuse (construction and operational phase)
- Regular monitoring of the rock phosphate facility, undertake regular audits to monitor any significant dust emissions
- Consult with the relevant environmental authorities to ensure that AEL cover the facility, prior to the commissioning of the facility.
- Ensure compliance to all conditions of the AEL

d) Impact Significance

Construction and Decommissioning:

The potential negative impact on air quality for the construction phase is considered to be of **moderate** significance without mitigation.

However, this potential impact will be reduced to a **low significance with mitigation.**

Operation:

The potential negative impact on air quality for the operational phase is considered to be of **low** significance without mitigation.

However, this potential impact will be reduced to a **lower significance with mitigation.**

3.3 Traffic and Right of Way

a) Environmental Overview

As indicated the proposed property on which the rock phosphate storage facility is to be constructed is bounded to the North by the John Ross Highway and the East by the West Central Arterial. Given that the rock phosphate will be delivered in closed conveyors it is not anticipated to have any large disruptions to the traffic.

b) Potential Impact

During the construction phase there will be an influx of construction vehicles and vehicles transporting materials in the area. This, coupled with construction activities, could potentially cause a disruption to the traffic flow

for the duration of the construction period. Once construction is complete it is anticipated that the only operational activities associated with the rock phosphate facility will be the regular transportation of waste to and from the site and the irregular transportation of substances, equipment or for maintenance purposes.

Due to the nature of the project and the use of enclosed conveyors, traffic may be disrupted should the conveyors be compromised in any way and there is an increased use of trucks to transport rock phosphate.

c) Mitigation Measures

Typical mitigation measures to mitigate traffic impacts during the construction phase would include the following:

- Liaise with the relevant traffic and transportation authorities, e.g. uMhlathuze Municipality and DOT on envisaged traffic impacts, e.g. on transportation of bulky equipment
- Ensure that adequate signage be provided during the construction phase to notify drivers of the increase in heavy vehicles entering and Grindrod facility access as a result of construction, particularly along the WCA southerly approach to the storage facility access.
- Train construction staff to show respect to other road users and give public vehicles the right of way
- Minimise construction activities in roads during peak hours
- Minimise congestion and traffic obstruction e.g. by keeping lanes open and introducing traffic control measures
- Ensure that construction and maintenance vehicles keep to the speed limits on public roads (construction and operational phase)
- Ensure that all material or equipment transported on public roads are appropriately secured on the vehicle and where necessary covered, to prevent any load falling off or spilling onto public roads.
- Ensure that during times of conveyor failure, trucks deliver rock phosphate out of peak traffic times.
- Ensure that for abnormal loads the weight and / or height and turning restrictions need to be verified for the proposed route to be followed.

d) Impact Significance

The Rock Phosphate Storage Facility will be constructed adjacent to the existing Foskor site and hence most of the construction and operational activities will be confined to the site, with low volumes of external traffic. Furthermore, due to the site being located within an industrial area the traffic in the area is generally moderate. Traffic during construction or operation would unlikely cause any significant disturbance to public traffic particularly since construction activities on roads will be minimised during peak hours.

Nevertheless, temporary traffic disturbances might occur on the route during transportation of unusually large and bulky equipment. This could potentially result in or aggravate local congestion, particularly during peak hours.

Construction and operational activities that may impact traffic will however be intermittent and of very short duration.

Construction and Decommissioning:

The potential impact of the activity on traffic during the construction/decommissioning phase is considered to be of **low significance without mitigation**.

This potential impact will be reduced to an **even lower significance with mitigation**.

Operation:

The potential impact of the activity on traffic during the operational phase is therefore considered to be of **low significance without mitigation**.

This potential impact will be reduced to an even **lower significance with mitigation**.

3.4 Visual and Aesthetics

a) Environmental Overview

The potential visual impact would mainly result from the large bunker building which would contribute further to the industrial characteristics of the area. The building would be visible to road users who will be passing by on the John Ross highway or West Central Arterial. However, the area surrounding the site is zoned general industry and the nearest residential area/community is more than 2km away. The proposed storage facility will therefore not be of significant visual impact to anyone.

b) Potential Impact

During the construction phase the introduction of construction camps and associated activities may be unsightly and become aesthetically unpleasing to road users.

During the operation phase the building design of the rock phosphate storage facility and associated activities may be visually unappealing to road users passing by. The area is however zoned general industry and the building will therefore fit into its surroundings.

Some of the visual and aesthetic impacts may result from:

- Signage
- Construction activities
- Ineffective management of waste (littering) during construction and operation of the proposed development

- Building infrastructure (rock storage facility).

c) Mitigation Measures

Mitigation during construction:

- Ensure that the contractor plans the construction site layout appropriately, including materials stocking, waste management and temporary latrine areas, by providing a layout plan which the ECO must approve prior to the contractor occupying the site
- Arrange additional and appropriate construction lay down areas outside the site, if lay down areas on the site is inadequate
- Adhere to good housekeeping during the construction phase to ensure that construction camps and sites are well organised, material is neatly stacked and waste is regularly removed
- Ensure that soil stockpiles are neatly kept to avoid soil dispersing (e.g. positioned at equal distances from the trench cable along the installation area)
- Implement effective litter control measures to prevent construction litter
- Implement appropriate waste and rubble management and disposal procedures
- Provide screens to shield unsightly areas from view of public roads
- Include as much of the natural vegetation around the site to reduce any significant visual impacts during the operation phase.

d) Impact Significance

The construction phase will be of a relatively short duration and once finished all of the materials and building structures will be removed from the site. Due to the industrial nature of the area the construction of the rock phosphate storage facility is unlikely to have a significant aesthetic impact.

Once in place, the rock phosphate storage facility could potentially have an aesthetic/visual impact, which could only be mitigated through design features. However as mentioned, the proposed rock phosphate storage facility is surrounded by other industries and a distance away from any residential area or other commercial or public centres. Visual and aesthetic impact therefore would likely be insignificant.

Construction and Decommissioning:

The potential visual and aesthetics impact of the activity on during the construction phase is therefore considered to be of **moderate significance without mitigation**.

This potential impact will be reduced to a **low significance with mitigation**.

Operation:

The potential visual and aesthetics impact of the activity during the operational phase is therefore considered to be of a **low significance without mitigation**.

This potential impact will be reduced to an even **lower significance with mitigation**.

3.5 Noise

a) Environmental Overview

See section **3.4 (a)** and **(d)** above for a description of the surrounding environment.

b) Potential Impact

There is the potential for noise impact during the construction and operational phase of the Rock Phosphate Storage Facility Project. Excessive noise can have a negative impact on people situated closest to the construction activities. It can affect one's ability to work, learn, rest, relax, sleep, etc. Excessive noise can also lead to mental and physical health problems.

With regards to the rock phosphate storage facility, ambient noise levels are expected to rise during the construction and operation of the store as described below but are not expected to increase above the current levels of the adjacent Foskor facilities. Construction activities will be limited to the site, which is located in an industrial area of Richards Bay and will be restricted to working hours thus the impact on residents or communities in the area will be unlikely.

Construction and Operation activities that may cause noise include:

- Vehicle traffic (entering and exiting the site)
- Generator noise from construction equipment
- Noise from hydraulic hammers and winches
- Construction worker voices
- Other general construction noise
- Operational noises from conveyors etc

c) Mitigation Measures

Typical mitigation measures during the construction phase include the following:

- Restrict very noisy construction activities, e.g. breaking up concrete hardstanding with pressure hammers, to daytime
- Meet regulatory requirements in terms of site boundary noise limits
- Ensure that all vehicles and where possible noisy equipment are fitted with silencers that are properly maintained

- Refrain from using routes for haulage through or close to residential areas during night time.
- Refrain from operations during the night as sound may travel to residential areas and communities

d) Impact Significance

Construction activities that emit noise include transportation vehicles, generator noise, noise from pressure hammers and winches, construction worker voices etc. However, due to the high industrial background noise, it is unlikely that the activities associated with the Project, would significantly increase the noise level. Noise levels must however be monitored to ensure it does not exceed the desired noise level as indicated by SANS. With the nearest residential area being more than 2 kilometres away from the Facility, some mitigation against potential noise impact is provided.

The background noise in the area, associated with the heavy industrial activities is typically high. Noise concerns related to the operation of the rock phosphate storage facility include operational noises (conveyors, workers) and vehicle noises. These would however be further addressed through appropriate equipment and design specifications.

Construction and Decommissioning:

The potential noise impact of the activity during the construction phase is considered to be of **low significance without mitigation.**

This potential impact will be reduced to an even **lower significance with mitigation.**

Operation:

The potential impact on noise levels during the operational phase is therefore considered to be of **low significance without mitigation.**

This potential impact will be reduced to an **even lower significance with mitigation.**

3.6 Community Relationship - Influx of Temporary Construction Workers

a) Environmental Overview

Like most of South Africa, the Richards Bay area has relatively high rates of unemployment and poverty. The majority of the people from local communities who are unemployed will therefore be looking for work and may visit the site for any potential job opportunities.

b) Potential Impact

The influx of temporary construction workers and work-seekers for the entire construction period is therefore unavoidable. The limited number of temporary jobs could potentially lead to disputes within local communities. Construction contractors will also use their own workers and this may exacerbate community conflicts. Other negative attributes associated with the influx of people include crime and prostitution, with the resultant risk of the spread of sexually transmitted diseases, of which HIV/AIDS is most significant.

During the operation phase, there may be an influx of people looking for work, however it is not expected that any jobs will be provided as this is merely a storage facility.

c) Mitigation Measures

Typical mitigation measures are the following:

- Use local labourers and contractors where possible
- Train construction workers to respect the property and needs of the adjacent landowners and to minimise any unnecessary disturbance
- Ensure that adequate lines of communication are established between Foskor, the contractors and the neighbouring landowners to deal with any public grievances
- Formulate a rapid response plan to deal with security matters
- Ensure that the contractors' camp is fully fenced and that access is controlled
- Deal with transgressions by construction staff severely (fines and dismissals).

d) Impact Significance

Construction and Decommissioning:

It is unlikely that there will be a significant influx of workers to the area.

The potential impact on community due to immigrate workers during the construction phase is therefore considered to be of **moderate significance without mitigation**.

This potential impact will be reduced to a **low significance with mitigation**.

3.7 Heritage

a) Environmental Overview

Cultural artefacts that are of heritage importance such as graves, tools, painting etc are not anticipated to be found on site.

b) Potential Impact

Cultural artefacts that are of heritage importance such as graves, tools, painting etc can be damaged or destroyed through construction activities. It is however not foreseen that any heritage resources will be found, as the site, as a whole, is generally disturbed. GIBB is of the opinion that no heritage impact assessment is required although the EMP will consider and provided mitigation measures should potential heritage artefacts be discovered. GIBB has also contacted Amafa in this regard who have requested that a need and desirability form be completed and submitted.

c) Mitigation Measures

Typical mitigation measures include the following:

- Place any excavations on hold, should any heritage features or artefacts, or skeletons or bones that could potentially be from human origin, be uncovered
- Report any potential heritage features uncovered during the construction activities to the ECO and Amafa and follow any instructions they may give
- Resume excavations that had been placed on hold for potential heritage impact reasons, only after Amafa has formally granted approval thereof.

d) Impact Significance

As stated above, it is not foreseen that any heritage resources would be found on the site, due to the industrial disturbance thereof. Excavations for foundations during the construction phase might however potentially uncover unknown heritage features or artefacts, which would need to be dealt with in accordance with the relevant legislated procedures.

Construction:

The potential impact on heritage artefacts during the construction phase is therefore considered to be of **a low significance without mitigation**.

This potential impact will be reduced to an **even lower significance with mitigation**.

DOCUMENT CONTROL SHEET
(FORM IP180/B)

CLIENT	:	Foskor Pty (Ltd)		
PROJECT NAME	:	Rock Phosphate Storage Facility on portions 55 and 56 of Erf 5333	**PROJECT No. :**	J31280
TITLE OF DOCUMENT	:	Impact Assessment (Appendix F)		
ELECTRONIC LOCATION	:	P:\J31280 - Foskor Rockphosphate EIA\G - REPORTS\Final BAR\Appendix F		

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