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INITIAL ENVIRONMENTAL RISK ASSESSMENT - BEC/217/BA

THE PROPOSED UPGRADE OF THE BOSHOF COMBINED SCHOOL IN THE TOKOLOGO MUNICIPALITY, LEJWELEPUTSWA DISTRICT MUNICIPALITY, FREE STATE PROVINCE

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Abbreviations

DETEA	Department of Economic Development, Tourism and Environmental Affairs
DAFF	Department of Agriculture, Forestry and Fisheries
DWA	Department of Water Affairs
EMP	Environmental Management Plan/Programme
EMS	Environmental Management System
EAP	Environmental Assessment Practitioner
I&AP	Interested and Affected Party
IMP	Integrated Management Plan
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
NWA	National Water Act
SANS	South African National Standard
SAHRA	South Africa Heritage Resource Agency

Glossary

- Biodiversity** : The variety of life and its processes; including the variety of living organisms the genetic differences among them, the communities and ecosystems in which they occur, and the ecological and evolutionary processes that keep them functioning, yet ever changing and adapting.
- Clearing** : The clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified.
- Contractor** : The person or company appointed by the service provider to carry out stipulated activities (i.e. vegetation clearance and rehabilitation).
- Environment** : The surroundings within which humans exist and that is made up of:
- a) The land, water and atmosphere of the earth;
 - b) Micro-organisms, plant and animal life;
 - c) Any part or combination of a) and b) and the interrelationships among and between them; and
 - b) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being (*i.e.* the social environment).
- Environmental Impact** : An action or series of actions that have an effect on the environment.
- Habitat** : A dynamic system of plant, animals and micro-organism communities and their non-living environment interacting as a functional unit.
- Hazardous Substances** : Substance governed by the Hazardous Substances Act as well as the Hazardous Chemical and Substances Regulations.
- Indigenous species** : Any species of flora or fauna that naturally occurs in a specific area.

- Natural vegetation** : The existing vegetation species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on the site
- General Waste** : The waste that does not pose an immediate hazard or threat to health or to the environment, and includes:
- a) domestic waste;
 - b) Building and demolition waste;
 - c) Business waste; and
 - d) Inert waste.
- Hazardous Substances** : Substance governed by the Hazardous Substances Act as well as the Hazardous Chemical and Substances Regulations.
- Pollution** : Any change in the environment caused by –
- (a) substances; or
 - (b) noise, odours, dust or heat, emitted from any activity associated with the clearance or rehabilitation phases, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.
- Risk** : The chance of something happening that will have an undesired impact.
- Sensitive area** : An area that is denoted as sensitive by the ecologist or ECO due to its particular attributes, which could include the presence of rare, endangered or red data vegetation, the presence of heritage resources, the presence of a unique natural feature or the presence of a watercourse or water body.
- Site** : The piece of land and any other place on, under, over, in or through which the specific activity are to be executed or carried out. The site shall include the activity area or route and access route.

- Solid waste** : All solid waste, chemical waste, wrapping materials, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).
- Water Quality** : Means the physical, chemical, toxicological, biological (including microbiological (a) and aesthetic properties of water that determine sustained (1) healthy functioning of aquatic ecosystems and (2) fitness for use (e.g. domestic, recreational, agricultural and industrial). Water quality is therefore reflected in (a) concentrations or loads of substances (either dissolved or suspended) or microorganisms, (b) physic-chemical attributes (e.g. temperature) and (c) certain biological responses to those concentrations, loads or physic-chemical attributes.
- Water Resource** : A water resource includes any watercourse, surface water, estuary or aquifer. Watercourses include rivers, springs, and natural perennial and non-perennial channels. Wetlands, lakes, dams, or any collection identified as such by the Minister in the Government Gazette.

1 Introduction

Bophelo Environmental Consultants was appointed by Crane Registered Quantity Surveyors to conduct an environmental risk assessment/fatal flaw assessment at Boshof Combined School located on a portion of erf 91 (1.3 ha), Kareehof suburb in Boshof Town, Boshof Administrative region in the Free State Province.

The site is currently used for educational purposes (i.e. school) with existing structures and infrastructure. The majority of the structures at the built-up area are not permanent (e.g. pre-fabricated classrooms), the remainder of the site is used for recreational (e.g. playground) purposes. It is the intention through the Free State Accelerated School Infrastructure Delivery Initiative (ASIDI) to remove the non-permanent structures and replace them with permanent structures and infrastructure.

The proposed upgrade will be located within the parameters of the existing school boundary, thereby minimising the associated impact on the environment. The fact that the site has already been altered as a result of the existing school activities will minimise the potential impact of the proposed activities on the environment. It will also limit the possibility of the proposed activities triggering a listing activity in terms of NEMA requiring an EIA/BA to be conducted.

It was confirmed by the project engineer that the proposed development will be able to connect to the municipal bulk reticulation system with regard to electricity, water, sewerage and waste removal.

1.1 Project objective and scope

The investigation had the following aims:

- Determine the status quo of the site namely the current situation, physiographic profile, natural resources, topography and infrastructure;
- The graphic depiction of environmental sensitivities, which will include the following:
- The occurrence of Heritage and Archaeological Remains;
- The presence of ecological sensitive habitats and eco-systems (i.e. drainage channels, floodplains, rocky outcrops);
- Recommendations with regard to the proposed development site in terms of the relevant environmental legislation.

2 Proposed Activity

2.1 Locality

The study area falls within the jurisdiction of the Tokolong Local Municipality, Lejweleputswa District in the Boshof administrative region, Free State Province. The proposed development site is situated on a portion of erf 91 (1.3 ha), Kareehof suburb in Boshof Town. Access to the site is obtained from Duiker Street located to the south of the site.

The general coordinates of the site:

S 28°54'19.34"; E 25°24'58.88"



Figure 1: Locality Map

3 Description of Affected Environment

3.1 Land Uses

The site is currently used for educational purposes (i.e. school). The neighbouring erven is used for residential, cemetery and open space purposes.

3.2 Vegetation

The study area forms part of the Savanna Biome. The vegetation according to Acocks, 1988, is *Kimberley Thorn Bushveld*. According to Bredenkamp and Van Rooyen, 1996, the site is classified as *Pan-Turf Invaded by Karoo*. The natural vegetation on site has been completely altered as a result of the structures, infrastructure and activities associated with the existing school.

3.3 Topography

The regional topographical setting of the study area is classified as *Plains and Pans*. The site is located in a relatively flat/plain area with a slight rise in slope towards the south-west. The highest point is located in the south-western section of the site at an elevation of approximately 1253 m above mean sea level (mamsl), with the lowest point occurring in the north-east at an elevation of approximately 1250 mamsl.

3.4 Surface Water

The site is located within the Quaternary Catchment Area (QCA) **C31C**, situated within the Lower Vaal Catchment Management Area (CMA). The site drains mainly by means of surface run-off (i.e.: sheetwash), with surface water flowing towards a footpath located to the north of the site. The flat topography of the site could result in localised ponding during heavy precipitation events.

It must be noted that no wetlands, pans, river or streams were identified on site.

3.5 Sub-surface Water

No sub-surface seepage was observed on site. The footpath to the north of the site exposed a narrow calcrete horizon, which are usually associated with perched water tables.

3.6 Geology and Soils

According to available geological information the study area is underlain by shale of the Ecca Group, Karoo Sequence with dolerite intrusions. The study area does not reflect any risk for the formation of sinkholes or subsidence caused by the presence of water-soluble rocks (dolomite or limestone). This must still be confirmed by the engineering geologist/civil engineer. The site is covered by red-yellow apedal, freely

drained soils; red, high base status, > 300 mm deep (no dunes).

3.7 Existing Services and Infrastructure

The western section of the site has already been built-up with non-permanent and permanent structures, while the eastern section of the site is currently used for recreational purposes.

The proposed site is connected to the municipal reticulation system with regard to water, sewerage, electricity and solid waste removal.

Pipelines, power cables or any other underground services may however be present. The planners should refer to services reports and databases of the local authorities to identify any such structures that may affect the suitability of the site or result in costly relocation of services.

4 General View of the Site



5 Ecological Sensitivity Status

Aspects of sensitivity function at different levels of environmental management. In this assessment three important components in line with the Biodiversity Act No. 10 of 2004 are taken into account:

- 1) Presence or absence of threatened species or other species of particular conservation concern
- 2) Presence or absence of threatened ecosystems or other ecosystems of particular conservation concern
- 3) State of indigenous biodiversity and endemism

A simple five class system is constructed with the three most important components, threatened species, threatened ecosystems and state of biodiversity used for ranking in a hierarchical manner. The emphasis of this sensitivity ranking is on the Biodiversity Act No. 10 of 2004 which addresses both sensitive species and sensitive ecosystems. This system prioritizes for species and ecosystems more prone to extinction and therefore prioritise for loss of irreplaceable biodiversity and ecosystem complexity. Other aspects of sensitivity of ecosystems such as rangeland condition, carrying capacity and agricultural potential are also very important to take into account, but function for purposes which they were designed for. Wetlands, though these may contain large overlap to other ecosystems in terms of sensitivity, are dealt with separately because these have a unique place in terms of ecosystem functioning and legislation.

In this case no wetlands were identified on the site. Also agricultural potential or rangeland condition is dealt with separately. In the case of this study such assessment is not necessary for the sensitivity ranking.

Five sensitivity rankings, which take into account species of particular conservation concern, ecosystems of particular conservation concern and an assessment of indigenous biodiversity at a site, are distinguished. Ranking of possible impact, an assessment of species, ecosystems and biodiversity in terms of conservation concern as well as an indication of appropriate types of management decisions, are given.

Table 1: Ranking of the sensitivity of ecosystems at site, which is based on the Biodiversity Act No. 10 of 2004.

Ranking of anticipated impact	Assessment of species, ecosystems and biodiversity of conservation concern	Indication of appropriate decisions: avoidance, mitigation, remediation.
Very low	No species of particular conservation concern is present No ecosystem of particular conservation concern is present. Severely degraded ecosystem for which little scope of restoration exists. Conspicuous low diversity of indigenous plant and animal species, these often pioneers with a wide distribution.	Opportunity to improve parts or aspects of ecosystem by remediation* of available areas of the site, and enhancement of indigenous biodiversity during and after development, if approved.
Low	No species of particular conservation concern present. No ecosystem of particular conservation concern present. Ecosystem disturbed or modified. Moderate or low diversity of indigenous species, mostly widespread species.	Mitigation measures aim at proper management of current lost habitat or anticipated lost habitat and available areas post development. This proper management should be directed at maintenance and where possible enhancement of indigenous biodiversity and ecosystem function as well as minimizing edge effects of possible new development.
Medium	No species of particular conservation concern present. If some declining species or protected species are present for which special mitigation measures apply, these measures are applicable and will lead to limited impacts. No ecosystem of particular conservation concern. Ecosystem in fair or moderately modified condition. Overall functioning of ecosystem still good. Moderate indigenous biodiversity, but mostly widespread species and few endemics.	Possible development should be carefully considered in terms of conservation priorities in the area and long term sustainable management of available areas and overall in terms of ecosystem functioning and conserving indigenous biodiversity. If, a few declining or protected species, which are widespread, are present, special mitigation measures which comply with

Ranking of anticipated impact	Assessment of species, ecosystems and biodiversity of conservation concern	Indication of appropriate decisions: avoidance, mitigation, remediation.
		legislation should be taken.
High	Regionally threatened species, globally near threatened species or particularly rare species are present. Or: Threatened ecosystem or particularly biodiversity rich ecosystem with highly endemic species is present.	No-go zone(s) for development identified. Biodiversity offsets not recommended. Special conservation measures of irreplaceable species or ecosystems, which are already at risk in a region, are necessary. Obligatory to comply with law.
Very high	Important habitat where viable and important population or subpopulation of a globally threatened species is present. Or: Highly threatened ecosystem or distinctly unique ecosystem in pristine condition is present.	No-go zones for development identified. No scope for biodiversity offsets at these zones. Special conservation measures needed to secure population(s) and habitat(s) of particular conservation importance. Obligatory to comply with legislation.

* Remediation can be reclamation, rehabilitation or restoration depending on the ideals and objectives of the remediation action.



Figure 2: Sensitivity Map

6 Legislation

The following is a brief description of some of the main environmental legislation and its applicability to this development:

6.1 National Environmental Management Act & EIA Regulations

The National Environmental Management Act 107 of 1998 (NEMA) establishes a set of principles, which all authorities (organs of State) have to consider when exercising their powers, for example during the granting of permits.

These include the following:

- Development must be sustainable;
- Pollution must be avoided or minimised and remedied;
- Waste must be avoided or minimised, reused or recycled;
- Negative environmental and social impacts must be minimised;
- Responsibility for the environmental consequences of a policy, project, product or service applies throughout its life cycle.

Section 28(1) states that “*every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring*”. If such degradation/pollution cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution.

These measures may include:

- Assessing the impact on the environment;
- Informing and educating employees about the environmental risks of their work and ways of minimising these risks;
- Ceasing, modifying or controlling actions which cause pollution/degradation;
- Containing pollutants or preventing movement of pollutants;
- Eliminating the source of pollution; and
- Remedying the effects of the pollution.

The upgrading of a school and associated activities with a footprint of ±1.3 ha within urban areas is not listed in terms of Government Notice No. R.544, R.545 and R.546 of the EIA Regulations, 2010. The proposed development will therefore not require a Basic Assessment (BA) or Full Environmental Impact Assessment (EIA) to be conducted and authorization obtained from the relevant environmental authority, before any development may take place.

6.2 National Water Act

The National Water Act aims to manage the national water resources to achieve sustainable use of water for the benefit of all water users. The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, and managed in sustainable ways.

Any person wishing to exercise a water use other than those defines in Schedule 1 of the NWA, or an existing lawful use, or a use promulgated by a GA, requires a water use licence. A water use licence attaches to the properties on which the water is used. There are certain activities defined in Section 21 of the NWA that need authorisation, these activities include:

- a. *Taking water from a water resource.*
- b. *Storing of water*
- c. *Impeding or diverting the flow of water in a watercourse*
- d. *Engaging in a stream flow reduction activity*
- e. *Engaging in a controlled activity (e.g. irrigation of any land with waste or water containing waste generated through any industrial activity or by waterworks.*
- f. *Discharging waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit.*
- g. *Disposing of waste in a manner which may detrimentally impact on a water resource.*
- h. *Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process.*
- i. *Altering the bed, banks, course or characteristics of a watercourse.*
- j. *Removing, discharging or disposing of water found underground for the continuation of an activity of for the safety of persons.*
- k. *Using water for recreational purposes (e.g. swimming, boating etc.).*

None of the above listed activities in terms of section 21 of the NWA will be triggered by the proposed development proposal. It is therefore not necessary to obtain a water use registration or water use authorisation for the development.

6.3 National Forest Act

In terms of the National Forests Act of 1998 forest trees or protected tree species may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold – except under license granted by the Department of Agriculture, Forestry and Fisheries (DAFF). None of the listed protected or forest trees were observed on site.

6.4 Natural Heritage Resources Act

The National Heritage Resource Act (Act no. 25 of 1999) was introduced to ensure protection of South Africa's important heritage features.

The act covers the following areas of heritage value:

- Archaeology
- Palaeontology
- Meteorites.

All the above-mentioned materials that are discovered are thus Property of the state. The Act sanctioned the establishment of the South African Heritage Resources Agency (SAHRA) in 1999. SAHRA is tasked with protecting heritage resources of national significance. Under Section 38 of the NHRA, all new developments which will change the character of a site and which exceed an area of 5 000 m², must at the very preliminary stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

The proposed upgrade will therefore require a Heritage Impact Assessment (HIA) to be carried out and authorisation obtained from SAHRA. It must be ensured that the HIA complies with SAHRA's requirements, and that any comments and recommendations from SAHRA have been taken into account prior to development.

7 Conclusions

The results of this environmental risk assessment revealed that the current site is suitable for the proposed upgrade, seeing that the majority of the site has been disturbed (i.e. school) and located within an existing urban area. The site can be readily connected to the municipal reticulation system.

The flat topography of the site could result in localised ponding during heavy precipitation events. A perched water table could be present along the northern boundary of the site.

8 Recommendations

In the light of the results of this investigation, the development of the additional school structures and infrastructures can be supported. The proposed development does not require an EIA/BA to be conducted in terms of NEMA.

A Heritage Impact Assessment (HIA) needs to be carried out and authorisation obtained from SAHRA prior to development.