BASIC ASSESSMENT PROCESS AND WATER USE LICENCE FOR THE PROPOSED REHABILITATION OF ORLANDO POWER STATION DAM, KLIPSPRUIT, CITY OF JOHANNESBURG, GAUTENG PROVINCE.

DRAFT BASIC ASSESSMENT REPORT

FOR PUBLIC REVIEW

MARCH 2020

Public Review Period

05 March 2020 to 06 April 2020

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GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014 (Version 1)

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2014.

2. This application form is current as of 8 December 2014. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.

3. **A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken.**

4. **A draft Basic Assessment Report (1 hard copy and two CD's) must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application.**

5. Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed in at offices of the relevant competent authority, as detailed below.

6. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.

7. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.

8. An incomplete report may lead to an application for environmental authorisation being refused.

9. **Any report that does not contain a titled and dated full colour large scale layout plan of the proposed activities including a coherent legend, overlain with the sensitivities found on site may lead to an application for environmental authorisation being refused.**

10. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the application for environmental authorization being refused.

11. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.

12. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.

13. Although pre-application meeting with the Competent Authority is optional, applicants are advised to have these meetings prior to submission of application to seek guidance from the Competent Authority.

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the of the Environmental Affairs Branch
P.O. Box 8769
Johannesburg
2000

Administrative Unit of the of the Environmental Affairs Branch
Ground floor Diamond Building
11 Diagonal Street, Johannesburg

Administrative Unit telephone number: (011) 240 3377
Department central telephone number: (011) 240 2500

(For official use only)

NEAS Reference Number:	
File Reference Number:	
Application Number:	
Date Received:	

If this BAR has not been submitted within 90 days of receipt of the application by the competent authority and permission was not requested to submit within 140 days, please indicate the reasons for not submitting within time frame.

Not Applicable, the report has been submitted within 90 days

Is a closure plan applicable for this application and has it been included in this report? **No**

if not, state reasons for not including the closure plan.

The proposed project involves rehabilitation of the Orlando Power Station Dam to improve on the safety of the deteriorating existing infrastructure. Decommissioning and closure phase has not been considered as part of this application due to the nature of the project.

Has a draft report for this application been submitted to a competent authority and all State Departments administering a law relating to a matter likely to be affected as a result of this activity? **Yes**

Is a list of the State Departments referred to above attached to this report including their full contact details and contact person? **Yes**

If no, state reasons for not attaching the list.

Have State Departments including the competent authority commented? **Yes**

If no, why?

PROJECT DETAILS

Title	:	Environmental Basic Assessment Process The Proposed Rehabilitation of Orlando Power Station Dam, Klipspruit, City of Johannesburg, Gauteng Province.
Report compiled by	:	Company Name: Envirolution Consulting Contact person: Ms. Jubilee Bubala Postal Address: P.O. Box 1898, Sunninghill, 2157 Telephone Number: 0861 44 44 99 Fax Number: 0861 62 62 22 Email: jubilee@envirolution.co.za
Client	:	Johannesburg Road Agency
Report Status	:	Draft Basic Assessment Report for public review
Review period		**The 30-day period for review is from** **05 March 2020 to 06 April 2020**

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SECTION A: ACTIVITY INFORMATION

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

Project title (must be the same name as per application form):

1.1 Project Title

The Proposed rehabilitation of Orlando Power Station Dam in Klipspruit, City of Johannesburg, Gauteng Province.

1.2 Background and Introduction

Orlando Power Station Dam is an earthfill embankment dam, 6 m high and 455 m long located in Soweto, North of the Potchefstroom Road and West of Chris Hani Hospital. The dam is also 12 km west of Johannesburg in the Gauteng Province. The dam is situated on a tributary of the Klipspruit River. The dam is more than 80 years old,

The dam was designed by Kanthack and Partners. Records show that the dam wall was constructed by Reid Knucky and the spillway by A. Stewart & Co in 1926 to provide cooling water for Orlando Power Station. The power station was finally closed in 1998 after 56 years of operation.

The dam was registered in terms of Section 21(b) of the National Water Act on 28 June 1991 and classified by the Dam Safety Office of the Department of Water Affairs on 24 October 1991. A letter dated 29 November 1991 from the DSO to the City Council of Johannesburg confirmed that Orlando Power Station Dam had been officially registered and classified.

An auxiliary spillway was designed by SRK in 1993 and constructed by the Greater Johannesburg Metropolitan Council on the left bank of the dam. The exact date of completion of the auxiliary spillway is not known. The location of Orlando Power Station Dam can be seen on the locality map found in Appendix A.

1.3 Project Description

The Orlando Power Station Dam is registered with DWS as a Category II Dam with a “Small” size classification and a “Significant” hazard rating. The “Significant” hazard rating is due to the presence of the main road bridge immediately downstream of the dam and the housing developments further downstream and adjacent to the dam. Previous dam safety inspection reports, including the latest one from 2019 found the following below:

- Embankment damage due to erosion of the upstream slope, or face, of the dam wall must be repaired and the NOC must be reinstated to currently accepted dam engineering standards. The dam safety upgrade as just described will require a lot of work and is deemed to be major ‘partial reconstruction’ of an existing dam wall.

- Upstream slope of embankment is infested with excess vegetation and trees
- Two (2) important components of the Auxiliary Spillway require maintenance and rehabilitation, respectively.
- Excessive vegetation in the Auxiliary Spillway
- Malfunctioning of the outlet pipe and control valve.

Johannesburg Road Agency proposes the following rehabilitation measures to be implemented to ensure the continued safe functioning of the dam:

1. Repair/replace and strengthen displaced, damaged and missing interlocking Armorflex blockwork on the training walls of the Auxiliary Spillway;
2. Backfilling of the trench along embankment crest. This can be temporary measure until the NOC has been reconstructed to currently acceptable engineering standards for embankment dams.

3. Rehabilitation and/or total reconstruction of the upstream face of the embankment from a level below where benching has commenced to NOC level and protected with properly designed rip-rap.

4. Rehabilitation and/or total reconstruction of the upper 1.8 m (at least) of the NOC of the embankment.

5. Rehabilitation and/or total reconstruction of the downstream face of the embankment with a blanket chimney drain and backfill of imported embankment to reinstate the downstream face of embankment to design slope of 1.0V:2.0H.

6. Upstream slope of embankment (excess vegetation and tree to be removed)

7. The right-hand training wall of the Auxiliary Spillway should be raised to NOC level and also extended in a downstream direction.

8. Removal of excessive vegetation in the Auxiliary Spillway.

9. Rehabilitation of the 600 mm diameter outlet pipe and control valve.

As seen above the works will essentially be rehabilitating of the existing structures. Reconstruction of the embankment crest might result in a nominal increase in height of the embankment. The existing spillway crest levels will remain as it is currently. The water level in the reservoir will therefore remain the same as it currently is. The upgrades to the spillway will be for repairing damaged lining. The spillway capacity will remain the same as it currently is.

With that background information, Figure 2 on page 10 shows several polygons which can be described as follows:

- Blue Polygon – Is the area that we think should be covered for this basic assessment. I myself am not certain why the area should extend upstream of the dam wall since we are not increasing the full supply level of the reservoir and we are not carrying out any rehabilitation work upstream of the dam wall. We've shown the Blue Polygon to extend to the main road downstream of the dam which is the extent that we think the wetland specialist should cover. It should be noted that there is sewerage spilling towards the area between the dam wall and the road and the standing water seen in that area is due primarily to the sewerage as well as possible seepage through the embankment. If it was just seepage contributing to that water then you could possibly consider that a wetland. I don't know if the sewerage affects defining it as a wetland.

- Pink Polygon – The construction footprint which covers the spillways and the embankment and an additional area downstream of the embankment.

- Green Polygon – Proposed location for the construction camp. The Orlando Power Station is no longer functional.

- Yellow marker sewerage spilling site. It is probably a manhole that is overflowing due to a blocked line.

Based on the above, the Johannesburg Road Agency is proposing the rehabilitation of the Orlando Power Station Dam and the proposed scope of works is as shown in Figure 2.

Prior to the development of the proposed project, Johannesburg Road Agency (JRA) requires an environmental authorisation from Gauteng Department of Agriculture and Rural Development (GDARD) and Water Use Licence (WUL) to be issued by the Department of Water and Sanitation (DWS). Johannesburg Road Agency has appointed Envirolution Consulting Pty Ltd as the independent Environmental Assessment Practitioner (EAP) to conduct the necessary environmental studies in order for JRA to receive an Environmental authorization and Water Use licence for the dam rehabilitation.

The scope of the project is to implement remedial measures necessary to improve the current status of the failing dam and minimize the probability of further degradation.

1.4 Location of Proposed Project

Orlando Power Station Dam is situated on Klipspruit 318 IQ, on the corner of Nicholas Street and

the M68, Klipspruit, Soweto, within the City of Johannesburg, Gauteng Province; refer to Figure 1 for the Locality Map and Appendix A.

The dam rehabilitation plan is attached within Appendix C

1.5 The Activities being applied for:

The activities to be undertaken will trigger the need for an application to the Gauteng Department of Agriculture and Development (GDARD) for environmental authorization. Due to activities impacting on a watercourse, a Water Use License (WUL) application will also be submitted to the Department of Water and Sanitation (DWS). In terms of these Regulations (Government Notice R. 982, Government Gazette No. 38282 of 04 December 2014, under sections 24(5), and 44, of the National Environmental Management Act, 1998 ; Act No.107 of 1998); a Basic Assessment is required for this project as per the following listed activities :

Table 1: Listed activities triggered by the proposed development requiring Environmental Authorization

Regulation	Activity	Description	Relevance
GN 983, 08 Dec 2014 as Amended Listing Notice 1 (327) of 7 April 2017	19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells grit, pebbles or rock of more than 10 cubic metres from a watercourse.	The proposed project will result in infilling or removal of ±15m³ or more of material into/from a watercourse during the construction and upgrade of the Dam
GNR.985, 08 Dec 2014 as Amended	12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan c. Gauteng ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or	Vegetation has colonised the dam and its spillway. The clearance of vegetation of approximately 300 square metres will occur downstream slope and at the toe of the embankment and spillway. The site is situated in the Soweto Highveld Grassland vegetation type that is classified as Endangered. According to the Gauteng Conservation Plan the Orlando Dam forms part of an Ecological Support Area (ESA) and surrounding grassland and moist fall within a Critical Biodiversity Area (CBA):

		bioregional plans; or	Important.
GNR.985, 08 Dec 2014 as Amended	14	The development of:– (vi channels exceeding 10 square metres in size:–) (xii) infrastructure or structures with a physical footprint of 10 square meters or more – where such development occurs - a) within a watercourse; b) In Gauteng: iv. sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) Gauteng Conservation Plan or in bioregional plans; v. sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004); vi) Sensitive areas identified in an environmental management framework adopted by relevant environmental authority.	- Repair/replace and strengthen displaced, damaged and missing interlocking Armorflex blockwork on the training walls of the Auxiliary Spillway; - Backfilling of the trench along embankment crest. This can be temporary measure until the NOC has been reconstructed to currently acceptable engineering standards for embankment dams. - Rehabilitation and/or total reconstruction of the upstream face of the embankment from a level below where benching has commenced to NOC level and protected with properly designed rip-rap. - Rehabilitation and/or total reconstruction of the upper 1.8 m (at least) of the NOC of the embankment. - Rehabilitation and/or total reconstruction of the downstream face of the embankment with a blanket chimney drain and backfill of imported embankment to reinstate the downstream face of embankment to design slope of 1.0V:2.0H.

			- The right-hand training wall of the Auxiliary Spillway should be raised to NOC level and also extended in a downstream direction. - Rehabilitation of the 600 mm diameter outlet pipe and control valve. The physical footprint of each of these structures is approximately ±10 square metres within a watercourse (Dam) an area identified as a sensitive area and also an Ecological Support Area by the Gauteng Conservation Plan and is areas protected by the National Water Act.

It is for this reason that a Basic Assessment Process is being conducted.

These activities may not commence without an environmental authorization from the competent Authority. The aim of the Environmental Impact Assessment is to ensure that:

- The potential environmental impacts associated with the proposed project are taken into consideration
- Public Participation Process is conducted i.e. to afford any Interested and or Affected parties (I&AP) sufficient opportunity: to provide comments
- Sufficient information is provided to decision makers in order to ensure an informed decision making.

The nature and extent of the proposed project are explored in more detail in this Basic Assessment Report. This report has been compiled in accordance with the requirements of the EIA Regulations and includes details of the activity description; the site, area and property description; the public participation process; the impact assessment; and the recommendations of the Environmental Assessment Practitioner.

1.6 Details of Environmental Assessment Practitioner and Expertise to conduct the Basic Assessment.

Envirolution Consulting (Pty) Ltd (Envirolution Consulting) has been appointed by Aurecon Engineers on behalf of Johannesburg Road Agency (JRA) to undertake a Basic Assessment process on behalf of the Johannesburg Roads Agency as an independent environmental

consultancy for the proposed project. Envirolution is not a subsidiary or affiliated with Aurecon Engineers or the Johannesburg Road Agency. Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project. Envirolution Consulting is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance with environmental legislation and evaluate the risk of development; and the development and implementation of environmental management tools. Envirolution Consulting benefits from the pooled resources, diverse skills and experience in environmental field held by its team. We offer solutions to environmental issues that are key during our clients' planning and decision-making processes. The Envirolution Consulting team have considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects in South Africa, including those associated with linear developments.

The EAPs from Envirolution Consulting who are responsible for this project are (refer to **Appendix I** for CV's):

- Jubilee Bubala, the principle author and EAP of this Basic Assessment holds a Master's of Science degree from the Witwatersrand University. She has 13 years of experience consulting in the environmental field. Her key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; environmental auditing and compliance reporting; the identification of environmental management solution and mitigation/risk minimising measures; environmental auditing, monitoring and reporting compliance; and developing and implementing ISO 14001:2004. Jubilee has been a project scientist for various EIA's in South Africa and Southern Africa. Jubilee is currently a Project Manager and Environmental Consultant at Envirolution Consulting Pty Ltd.

- Gesan Govender, the reviewer is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 17 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIA's for several diverse projects across the

country.

I. SPECIALIST'S DETAILS

Name of Specialist	Title of specialist report/ s as attached in Appendix G	Date issued
Antoinette Bootsma of Limosella Consulting	Biodiversity: Wetland/Riparian Delineation and Functional Assessment	February 2020
	General Wetland Rehabilitation and Monitoring Plan	January 2020
Antoinette Esseyl of Dimela Eco Consulting	1. Biodiversity (Flora) Assessment 2. Alien Plan Management Plan 3. Landscape Plant Species Plan	January 2020
Barbara Kasl (Pr.Sci.Nat. Registration No.: 400257/09),	Biodiversity (Fauna) Assessment	January 2020
J A van Schalkwyk	Heritage Impact Assessment	January 2020
Doctor Heidi Fourie)	Paleontological Desktop Study	February 2020

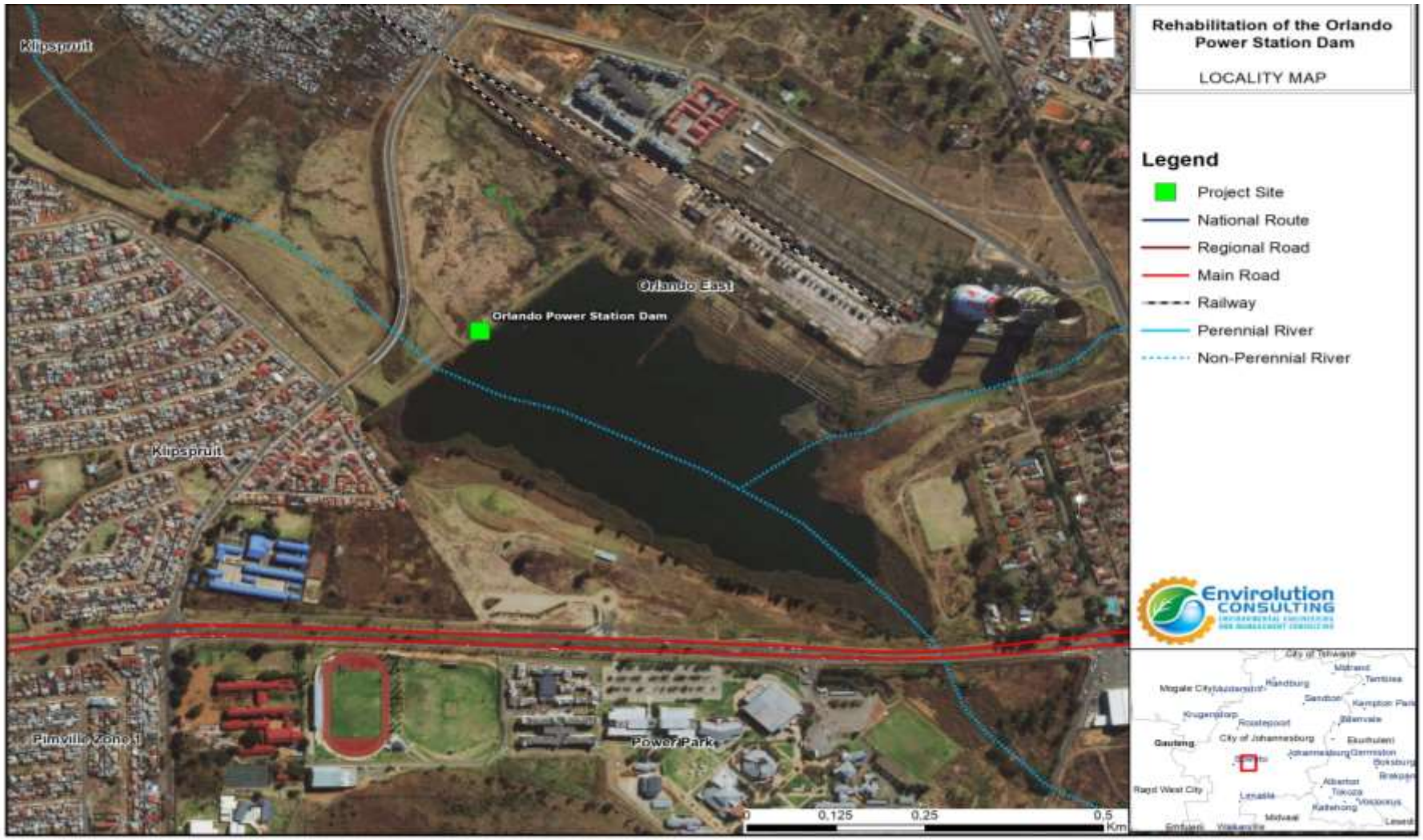

Figure 1: Locality Map showing the Orlando PS Dam.

Figure 2: Map showing activity areas and project footprint

Select the appropriate box

The application is for an upgrade of an existing development		The application is for a new development		Other, specify	

Does the activity also require any authorisation other than NEMA EIA authorisation?

YES

If yes, describe the legislation and the Competent Authority administering such legislation

Rehabilitation of the dam and its basin within the watercourse will occur on site. The dam occurs within a watercourse. It is for such reasons that a Water Use License has to be undertaken for the development. According to the National Water Act (NWA), 1998 (Act No.36 of 1998), the project will be required to be licensed in terms of the National Water Act (Act 36 0f 1998) for the following activities under Section 21:

- Storing water
- Impeding or diverting the flow of water in a watercourse;
- Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- Disposing of waste in a manner that may detrimentally affect a water resource; and
- Altering the bed, banks, course or characteristics of a watercourse.

The Integrated Water Use License Application (IWULA) is subject to authorization by the Department of Water and Sanitation (DWS) which is the national authority.

If yes, have you applied for the authorization(s)? **Yes**
If yes, have you received approval(s)? (attach in appropriate appendix) **No**

Impacts on the watercourse have been assessed through the BA process (Appendix G1 - Wetland Report) for the infrastructure. The following reports / studies as outlined below will be required to be attached to the water use license application which will be submitted to the competent authority the Department of Water and Sanitation via their EWULA online portal following the decision of the Basic Assessment Process by the Competent Authority GDARD.

The following will be uploaded among others on the online portal

- Basic Assessment Report
- Environmental authorization from GDARD once issued
- Wetland Assessment Specialist Study
- Wetland Rehabilitation Plan
- Other documents as requested by DWS.

2. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

Table 2: List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations:

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
Constitution of the Republic of South Africa, Act 108 of 1996:	▪ Section 24 of the Constitution provides for the environment that is not harmful for the health and people's wellbeing.	-	The proposed Development has been properly planned to ensure that it conforms to the principles of sustainable development
National Environmental Management Act (Act No. 107 of 1998)	▪ NEMA requires, inter alia, that: o Development must be socially, environmentally, and economically sustainable." o Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimized and remedied." o A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and	▪ DEA ▪ GDARD	In terms of sections 24 and 24D of the National Environmental Management Act (No 107 of 1998), as read with the EIA Regulations 2014 of GN R982 – R985 a Basic Assessment process is required to be undertaken for the proposed project.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	actions." ▪ EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorization are identified within these Regulations. ▪ In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorization.		
National Environmental Management Act (Act No. 107 of 1998)	▪ A project proponent is required to consider a project holistically and to consider the cumulative effect of potential impacts. ▪ In terms of the Duty of Care provision in S28(1) the project proponent must ensure that reasonable measures are taken	▪ DEA ▪ GDARD	▪ While no permitting or licensing requirements arise directly, the holistic consideration of the potential impacts of the proposed project has found application in the EIA Phase. ▪ The implementation of mitigation

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with a project is avoided, stopped or minimized.		measures are included as part of the EMPr and will continue to apply throughout the life cycle of the project.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	▪ The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. ▪ In terms of the regulations published in terms of this Act (GN 921 of November 2013), a Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities. ▪ Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that o The containers in which any waste is stored, are intact and	▪ DEA (hazardous waste) ▪ GDARD (general waste)	▪ In terms of GNR921, no waste license is required for the project. However, Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of this Act, as detailed in this EMPr.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	not corroded or in any other way rendered unlit for the safe storage of waste; o Adequate measures are taken to prevent accidental spillage or leaking; o The waste cannot be blown away; o Nuisances such as odor, visual impacts and breeding of vectors do not arise; and ▪ (e) Pollution of the environment and harm to health are prevented.		
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	▪ S18, S19 and S20 of the Act allow certain areas to be declared and managed as "priority areas". ▪ Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards.	▪ DEA ▪ City of Johannesburg	While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project for dust management.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	▪ The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act. ▪ Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan.		
National Water Act (Act No. 36 of 1998)	▪ Under S21 of the Act, water uses must be licensed unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorization. ▪ In terms of S19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from	▪ DEA ▪ GDARD	The proposed development requires a Water Use License as per the following regulations: According to the National Water Act (NWA), 1998 (Act No.36 of 1998), the project will be required to be licensed in terms of the National Water Act (Act 36 0f 1998) for the following activities under Section 21: ▪ Storing water;

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	occurring, continuing, or recurring.		▪ Impeding or diverting the flow of water in a watercourse; ▪ Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit; ▪ Disposing of waste in a manner that may detrimentally affect a water resource; and ▪ Altering the bed, banks, course or characteristics of a watercourse. The water use license application has been initiated. It is our understanding that the Dam is registered with DWS for Section 21b-storing of water; this will be confirmed during the

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
			preconsultaion meeting with DWS. The water use license application has been initiated ▪ Requirements set by S19 will apply throughout the life cycle of the project.
Environment Conservation Act (Act No. 73 of 1989)	▪ National Noise Control Regulations (GN R154 dated 10 January 1992)	▪ National Department of Environmental Affairs ▪ Gauteng Department of Agriculture and Resource Development ▪ Local Authorities	There is no requirement for a noise permit in terms of the legislation. However the act finds applicability in ensuring construction noise is below the legislated 85decibels
Hazardous Substances Act (Act No. 15 of 1973)	▪ This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitizing, or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To	Department of Health	It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. ▪ Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared to be Group I or Group II hazardous substance; ▪ Group IV: any electronic product; ▪ Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as		

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	distillate fuel) is prohibited without an appropriate license being in force.		
National Environment Management Protected Areas Act, 2003 (Act No. 57 of 2003).	Wetlands and other critical Biodiversity areas are regulated under the NEM: BA. Activities that fall within the parameters of these areas require specialist assessment to determine the impacts and the residual effects of mitigation measures	National Department of Environmental Affairs	A wetland specialist was appointed to determine the impacts and the residual effects of mitigation measures. Refer to appendix G1.
Conservation of Agricultural Resources Act (Act No 43 of 1983).	Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Declared Weeds and Invaders in South Africa are categorized according to one of the following categories: ▪ Category 1 plants: are prohibited and must be controlled. ▪ Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to	Department of Agriculture, Forestry and Fisheries (DAFF)	Alien mitigation measures have been included in the project EMPr. In addition an Alien Plant guideline report is attached as Appendix A of the EMPr.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	prevent their spread. ▪ Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the flood line of watercourses and wetlands.		
The Gauteng Conservation Plan (Version 3.3) (GDARD, 2011)	▪ The plan has classified areas within the province on the basis of its contribution to reach the conservation targets within the province. Critical Biodiversity Areas (CBAs) contain irreplaceable, important and protected areas (terms used in C-Plan 2) and are areas needed to reach the conservation targets of the Province. In addition 'Ecological Support Areas' (ESAs), mainly around riparian areas and	GDARD	On the study site only the sections associated with the watercourse is classified while the rest of the areas remain unclassified. The areas associated with the watercourses are classified as Important and Ecological Support Area.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	other movement corridors were also classified to ensure sustainability in the long term. Landscape features associated with ESAs is essential for the maintenance and generation of biodiversity in sensitive areas and requires sensitive management where incorporated into C-Plan 3.		
National Environmental Management: Biodiversity Act 2004 (Act 10 of 2004)	▪ This Act provides management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act107 of 1998; the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resource. ▪ Protection of biodiversity features and where possible relevant permits will need to be obtained. ▪ The National Environmental	▪ GDARD ▪ DEA	▪ During the site visit it was observed that numerous additional alien invasive species were present on site. Alien plant management measures are included in the project EMPr. ▪ A water use licence will be required to be obtained from Department of Water and Sanitation for undertaking works in the watercourse.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	Management: Biodiversity Act (NEMBA) is the most recent legislation pertaining to alien invasive plant species. In August 2014 the list of Alien Invasive Species was published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 78 of 2014). ▪ The Alien and Invasive Species Regulations were published in the Government Gazette No. 37886, 1 August 2014. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water		▪ An environmental authorisation from GDARD is being applied for, for undertaking works in the water course.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within close proximity to a watercourse.		
The Gauteng Conservation Plan (Version 3.3) (GDARD, 2011)	▪ The plan has classified areas within the province on the basis of its contribution to reach the conservation targets within the province. Critical Biodiversity Areas (CBAs) contain irreplaceable, important and protected areas (terms used in C-Plan 2) and are areas needed to reach the conservation targets of the Province. In addition 'Ecological Support Areas' (ESAs), mainly around riparian areas and other movement corridors were also classified to ensure sustainability in the long term. Landscape features associated with ESAs is essential for the maintenance and generation of	▪ GDARD	On the study site only the sections associated with the watercourse is classified while the rest of the areas remain unclassified. The areas associated with the watercourses are classified as Ecological Support Areas

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	biodiversity in sensitive areas and requires sensitive management where incorporated into C-Plan 3.		
Promotion of Access to Information Act, 2000 (Act No 2 of 2000):	▪ Legislation that allows the public access to information about activities that influence their well-being and to make contributions to decision making.	▪ DEA ▪ GDARD	▪ No permitting is required the act finds applicability during the public participation process phase of the basic assessment process.
National Heritage Resources Act (Act No. 25 of 1999)	▪ Section 38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including ▪ (c) any development or other activity which will change the character of a site—exceeding 5 000 m^2 in extent; Section **34.** (1) of the act states that`` No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority".	▪ South African Heritage Resources Agency	▪ The dam is over 80 years and therefore enjoy general protection under the National Heritage Resources Act, No. 25 of 1999; triggering the need for a heritage assessment study. ▪ A heritage impact study was undertaken for the project. Refer to appendix G4. ▪ From a heritage point of view, it is recommended that the proposed development be allowed to continue.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
			▪ A paleontological desktop study was undertaken for the project. Refer to appendix G4. No issues of concern were reported.
Standards and Guidelines			
The following design guidelines and standards will be used for the inspections and various design for the rehabilitation: ▪ SANCOLD 1990, Safety Evaluation of Dams, Report No. 3, Guidelines on Freeboard for Dams; ▪ SANCOLD 1991, Safety Evaluation of Dams; Report No.4, Guidelines on Safety in Relation to Floods; ▪ Various International Committee on Large Dams (ICOLD) Guidelines; ▪ HRU 1/72 1972; Design Flood Determination in South Africa; ▪ TR102, Southern African Storm Rainfall; ▪ USBR 1989, Design of Small Dams. ▪ Furthermore; The following acts and legislations will be complied with o The National Water Act (Act 36 of 1998); o The Dam Safety Regulations (Regulation R. 139 published in Government Gazette No. 35062 of 24 February 2012);			Applicability during the design of the Dam

3. ALTERNATIVES

Describe the proposal and alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The determination of whether the site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.

The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not** include the no go option into the alternative table below.

Note: After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Please describe the process followed to reach (decide on) the list of alternatives below

Site Alternatives

The nature of the project precludes alternative sites or properties from the assessment. This is due to the nature and requirements of the rehabilitation and remedial measures planned at the Orlando PS Dam, which forms part of the mandate as the JRA is required to repair much of the storm water related issues such as erosion and flooding identified within the catchment area. The localized, existing and nature of the development does, however, entail that only **Activity Rehabilitation Options** were considered within the mitigation hierarchy.

Table 3: Description of Proposed Remedial Plans and Alternatives

No.	Alternative type, either alternative: site on property, properties, activity, design, technology, energy, operational or other(provide details of "other")	Description
1	**Proposal**	**Current Conditions of the Orlando Power Station Dam and its associated infrastructure.** Previous dam safety inspection reports, including the latest statutory dam safety inspection from 2019 The dam embankment and spillway were found to be in generally a poor condition with excessive vegetation on the embankment slopes and spillway channel. The Johannesburg Road Agency recommended that rehabilitation measures be implemented to ensure the continued safe functioning of the dam. The following remedial works are proposed ▪ Repair/replace and strengthen displaced, damaged and missing interlocking Armorflex blockwork on the training walls of the Auxiliary Spillway. ▪ Backfilling of the trench along embankment crest. This can be temporary measure until the NOC has been reconstructed to currently acceptable engineering standards for embankment dams. ▪ Rehabilitation and/or total reconstruction of the upstream face of the embankment from a level below where benching has commenced to NOC level and protected with properly designed riprap. ▪ Rehabilitation and/or total reconstruction of the upper 1.8 m (at least) of the NOC of the embankment. ▪ Rehabilitation and/or total reconstruction of the downstream face of the embankment with a blanket chimney drain and backfill of imported embankment to reinstate the downstream face of embankment to design slope of 1.0V:2.0H. ▪ The right-hand training wall of the Auxiliary Spillway should be raised to NOC level and

		extended in a downstream direction. ▪ Rehabilitation of the 600 mm diameter outlet pipe and control valve In summary, the proposed works will essentially be rehabilitation of the existing structures. Reconstruction of the embankment crest might result in a nominal increase in height of the embankment. The existing spillway crest levels will remain as it is currently. The water level in the reservoir will therefore remain unchanged. The upgrades to the spillway will repair the damaged lining but the spillway capacity will remain unchanged.
	Structural Rehabilitation Alternatives	**Option 1** **Structural Rehabilitation: (Proposed and Preferred)** 1. Only rehabilitate the embankment and spillway without the addition of an outlet pipe; or **Option 2** **Structural Rehabilitation Alternative 1:** 2. Rehabilitate the embankment and spillway with the addition of an outlet pipe that is placed over the embankment to form a Siphon. The problem with **Option 2** is that the dam is situated in an area with a high risk of vandalism. The dam was originally constructed with outlet works consisting of an intake tower in the basin and an outlet pipe from the base of the tower that passes through the base of the embankment to the downstream end. A pedestrian bridge crossed from the embankment crest to the tower. As can be seen in Photographs 5 and 8 in the attached Appendix B, the pedestrian bridge has been removed by vandalism. Furthermore; there have been several deaths in 2013-2014 at the abandoned power station building which is adjacent to the

		dam when the structure collapsed with vandals removing metal for scrap. https://www.news24.com/SouthAfrica/News/Death-toll-rises-in-Soweto-building-collapse-20140626 Based on the above, Option 2. (Rehabilitate the embankment and spillway with the addition of an outlet pipe that is placed over the embankment to form a Siphon) , which include the reinstating the outlet works, is however not preffered in light of the pipework, valves etc which are vulnerable to vandalism. Hence option 1: (Only rehabilitate the embankment and spillway without the addition of an outlet pipe) is proposed and preferred. The Two Options mentioned above with thus be assessed in this Basic Assessment Process.
2.	**Site alternatives** (Undertake Rehabilitation elsewhere)	No site alternatives have been investigated for the proposed development for the following reasons: The facility under study was noted to have failed and flooding area. It is for such reasons that no other site alternatives were considered for this development. Thus only one site is deemed feasible and practicable for the proposed development.
3	**Other alternatives**	Please note that only Activity alternatives were considered for the purposes of this project as the project is an upgrade of an existing earth embankment dam.

In the event that no alternative(s) has/have been provided, a motivation must be included in the table below.

N/A

2. PHYSICAL SIZE OF THE ACTIVITY

Indicate the total physical size (footprint) of the proposal as well as alternatives. Footprints are to include all new infrastructure (roads, services etc.), impermeable surfaces and landscaped areas:

	Size of the activity:
Proposed activity (**Proposed Repair & Upgrade of existing Dam**)	The dam is 21.6 hectares and 3 hectares is the expected construction footprint The Spillway channel which is proposed for rehabilitation is 850 m. in length and narrows from 26 m wide to 7.5 m wide for the first 50 m
Alternatives:	
Alternative 1)	-
Alternative 2 (if any)	

or, for linear activities:

	Length of the activity:
Proposed activity	
Alternatives:	
Alternative 1	
Alternative 2 (if any)	

m/km

Indicate the size of the site(s) or servitudes (within which the above footprints will occur):

	Size of the site/servitude:
Proposed activity **(study area)**	3.85 Hectares.
Alternatives:	
Alternative 1	N/A
Alternative 2 (if any)	

Ha/m^2

3. SITE ACCESS

Proposed activity

Does ready access to the site exist, or is access directly from an existing road?	**YES**
If NO, what is the distance over which a new access road will be built	N/A

Describe the type of access road planned:

The Orlando Dam is situated within Soweto, directly south of the defunct Orlando Power Station and the well-known Soweto Towers (City of Johannesburg). The dam falls between the residential areas of Nancefield in the south-west and in Masopha in the north. Mbambisa Road (constructed in 2011) traverses the wetland downstream of the Orlando Dam. The site is therefore well-connected and easily accessible Refer to Figure 3. No new access roads are planned for the development.

Include the position of the access road on the site plan (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Figure 3: Overview of already existing access roads to site

Alternative 1 (Same as above)

Does ready access to the site exist, or is access directly from an existing road?	YES	NO
If NO, what is the distance over which a new access road will be built	m	

Describe the type of access road planned:

Include the position of the access road on the site plan. (If the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Alternative 2 (Not Applicable)

Does ready access to the site exist, or is access directly from an existing road?	YES	NO
If NO, what is the distance over which a new access road will be built	m	

Describe the type of access road planned:

Include the position of the access road on the site plan. (If the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

PLEASE NOTE: Points 6 to 8 of Section A must be duplicated where relevant for alternatives

Section A 6-8 has been duplicated | 0 | Number of times

(only complete when applicable)

4. LAYOUT OR ROUTE PLAN

A detailed site or route (for linear activities) plan(s) must be prepared for each alternative site or alternative activity. It must be attached to this document. The site or route plans must indicate the following:

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
  - A4 size for activities with development footprint of 10sqm to 5 hectares;
  - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
  - A2 size for activities with development footprint of >20 hectares to 50 hectares);
  - A1 size for activities with development footprint of >50 hectares);

- The following should serve as a guide for scale issues on the layout plan:
  - A0 = 1: 500
  - A1 = 1: 1000
  - A2 = 1: 2000
  - A3 = 1: 4000
  - A4 = 1: 8000 (±10 000)
- shape files` of the activity must be included in the electronic submission on the CD's;
- the property boundaries and Surveyor General numbers of all the properties within 50m of the site;
- the exact position of each element of the activity as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):
  - Rivers and wetlands;
  - the 1:100 and 1:50 year flood line;
  - ridges;
  - cultural and historical features;
  - areas with indigenous vegetation (even if it is degraded or infested with alien species);
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant buffer from the bank to be clearly indicated)

FOR LOCALITY MAP (NOTE THIS IS ALSO INCLUDED IN THE APPLICATION FORM REQUIREMENTS)

- the scale of locality map must be at least 1:50 000. For linear activities of more than 25 kilometers, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map;
- the locality map and all other maps must be in colour;
- locality map must show property boundaries and numbers within 100m of the site, and for poultry and/or piggery, locality map must show properties within 500m and prevailing or predominant wind direction;
- for gentle slopes the 1m contour intervals must be indicated on the map and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the map;
- areas with indigenous vegetation (even if it is degraded or infested with alien species);
- locality map must show exact position of development site or sites;
- locality map showing and identifying (if possible) public and access roads; and
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites.

The Locality Map and sensitivity map for the proposed development are enclosed within **Appendix A**

5. SITE PHOTOGRAPHS

Colour photographs from the center of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under the appropriate Appendix. It should be supplemented with additional photographs of relevant features on the site, where applicable.

Color photographs taken on site together with a description of each photograph are attached within **Appendix B**.

6. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity to be attached in the appropriate Appendix.

Please see facility illustrations attached within **Appendix C**

SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

Note: Complete Section B for the proposal and alternative(s) (if necessary)

Instructions for completion of Section B for linear activities
1) For linear activities (pipelines etc.) it may be necessary to complete Section B for each section of the site that has a significantly different environment.
2) Indicate on a plan(s) the different environments identified
3) Complete Section B for each of the above areas identified
4) Attach to this form in a chronological order
5) Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.

Section B has been duplicated for sections of the route | 0 | times

Instructions for completion of Section B for location/route alternatives
1) For each location/route alternative identified the entire Section B needs to be completed
2) Each alterative location/route needs to be clearly indicated at the top of the next page
3) Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives | 0 | times (Complete only when appropriate)

Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application

Section B is to be completed and attachments order in the following way
- All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
- All significantly different environments identified for Alternative 2 is to be completed and attached chronological order, etc.

Section B - Section of Route | | (complete only when appropriate for above)

Section B – Location/route Alternative No. | | (complete only when appropriate for above)

1. PROPERTY DESCRIPTION

Property description: (Including Physical Address and Farm name, portion etc.)

The activities will occur within the Dam and its basin. The Dam/watercourse affected is under the City's jurisdiction

Farm Name/ Township Agriculture Holding A.H	Portion Number	21 Surveyor General Codes
Klipspruit 318 IQ	Portion 96	T0IQ00000000031800000

2. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in decimal degrees. The degrees should have at least six decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Note: Alternative site in terms of this development is not applicable only Activity Alternatives were considered.

Proposed Activity:	**Latitude (S):**	**Longitude (E):**
Centre point of the activity	26°15' 15.11"S	27°55 '12.08"E.

In the case of linear activities:

Proposed Activity:	Latitude (S):	Longitude (E):
Starting point of the activity		
Middle point of the activity		
End point of the activity (		

Alternative 1	**Latitude (S):**	**Longitude (E):**
▪ Starting point of the activity		
▪ Middle point of the activity		
▪ End point of the activity		

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix

Addendum of route alternatives attached	**N/A**

The 21 digit Surveyor General code of each cadastral land parcel

The 21 digit surveyor general code of each cadastral land parcel is included in Section 1 Under Property Description.

3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Proposed Activity

Flat	**1:50 – 1:20**	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

4. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site.

Proposed Activity

Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	**River front**

5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

	Proposed Activity:		Alternative S2 (if any):		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	YES ✔		YES	NO	YES	NO
Dolomite, sinkhole or doline areas		NO	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	YES ✔		YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil		NO	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES ✔		YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)		NO✔	YES	NO	YES	NO
Any other unstable soil or geological feature		NO✔	YES	NO	YES	NO
An area sensitive to erosion	YES ✔		YES	NO	YES	NO

(Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

b) are any caves located on the site(s) NO □

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
°	°

c) are any caves located within a 300m radius of the site(s) NO□

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
°	°

d) are any sinkholes located within a 300m radius of the site(s) NO□

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
°	°

If any of the answers to the above are "YES" or "unsure", specialist input may be requested by the Department

Hydrology and Topography

Surface water spatial layers such as the National Freshwater Ecosystems Priority Areas (NFEPA) Wetland Types for South Africa (SANBI, 2010) and Gauteng Department of Agriculture and Rural Development (GDARD) were consulted for the presence of wetlands and rivers. This layer reflects one watercourse that runs through the study area (Figure 4). The wetland vegetation group of the study area is Mesic Highveld Grassland Group 3.

The wetland on the study site forms one of the tributaries of the Klip River. This river eventually confluences with the Vaal River. This river of strategic importance is the third largest river in South Africa after the Orange River (2200 km long) and the Limpopo River (1750 km long) and was established as the main source of water for the great Witwatersrand area after the gold rush during the 19th Century (http://www.randwater.co.za).

The site is situated in Quaternary Catchment C22A. In this catchment, the precipitation rate is considerably lower than the evaporation rate with a Mean Annual Precipitation (MAP) to Potential Evapotranspiration (PET) of 0.32. Consequently, wetlands in this area are sensitive to changes in regional hydrology, particularly where their catchment becomes transformed and the water available to sustain them becomes redirected. The Quaternary Catchment C22A fall within the fifth WMA, the Vaal Major. The major rivers that are located within this WMA include the Wilge-, Liebenbergsvlei-, Mooi-, Renoster-, Vals-, Sand-, Vet-, Harts-, Molopo and Vaal River. The wetland and associated dam flows south into the Klip River, which eventually drains into the Vaal River.

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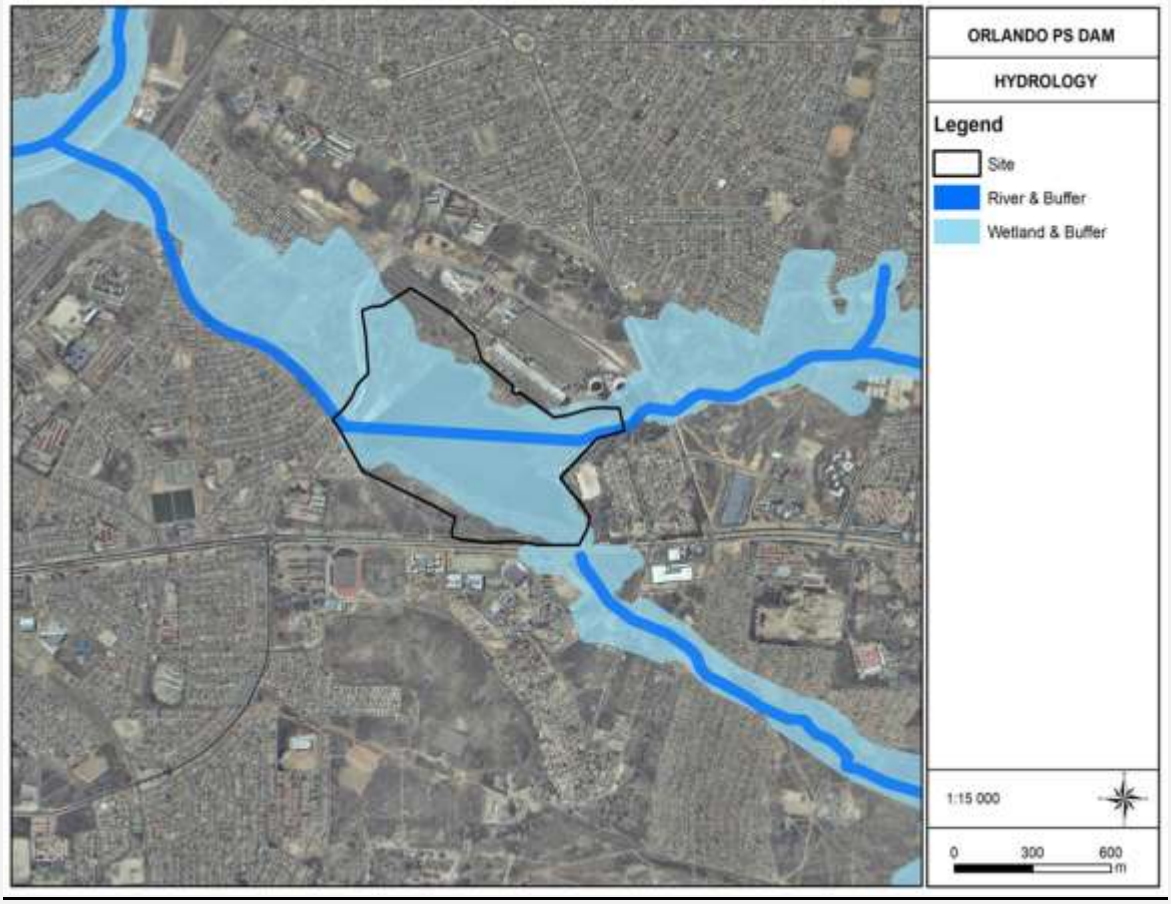

Figure 4: Regional hydrology

Geology and Soils

The entire site is underlain by Klipriviersberg and Turffontein geological units (GDACE, 2002) (Figure 3). The regional soil description for the area is summarised in the table and figures below (Table 4 & Figure 5)

Table 4: Soil of the study site

Soil Name	Description	Relation to wetlands
U – Entire study area	Unconsolidated/Urban Soil Usually considered a disturbed soil which no longer retains recognizable profiles following anthropogenic disturbance.	None

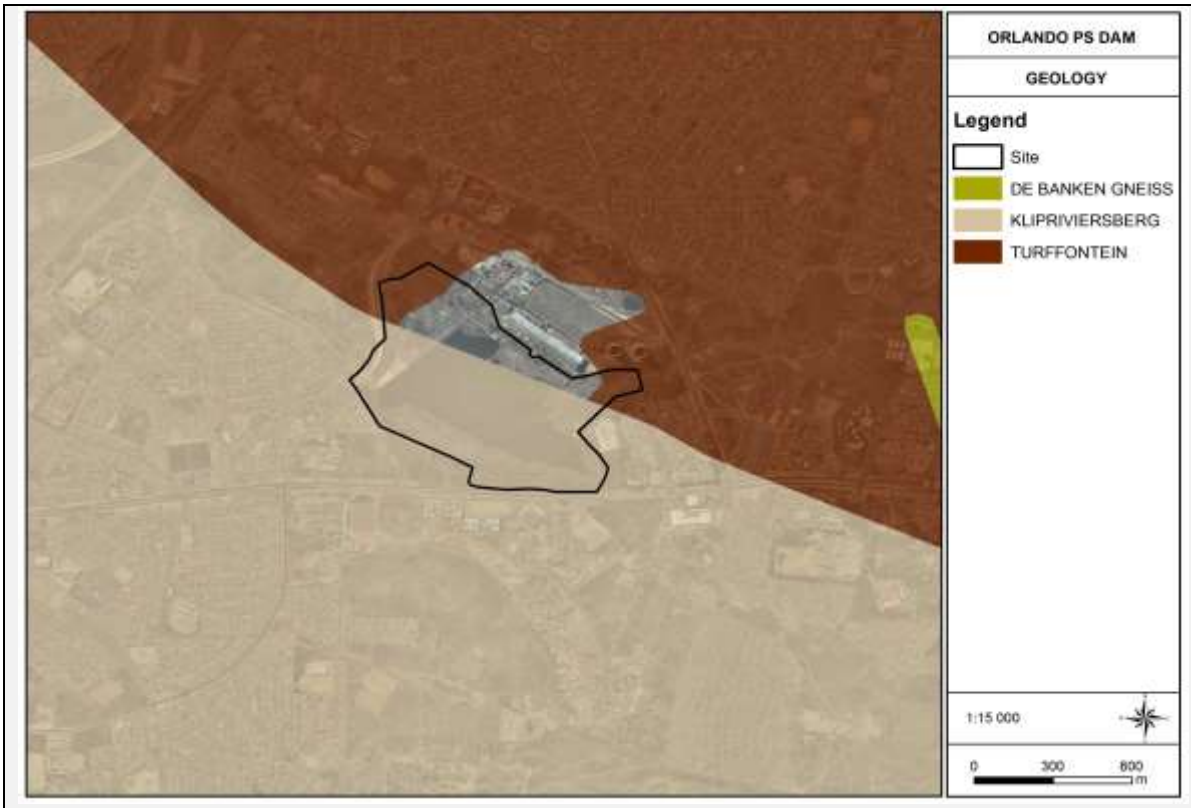

Figure 5: Soil of the study area and surroundings.

The soil profile of the area is predominantly disturbed by anthropogenic activities associated with construction of commercial and residential infrastructure and roads as well as the construction of the dam.

6. AGRICULTURE

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)? NO □

Please note: The Department may request specialist input/studies in respect of the above.

7. GROUNDCOVER

To be noted that the location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Indicate the types of groundcover present on the site and include the estimated percentage found on site

Proposed Activity

Natural veld - good condition % =	Natural veld with scattered aliens % =	**Natural veld with heavy alien infestation % =60**	Veld dominated by alien species % =	Landscaped (vegetation) % =
Sport field % =	Cultivated land %=	Paved surface (hard landscaping) % =	**Building or other structure % =40**	**Bare soil % =10**

7.1 Land Use, Cover and Ecological State

The Orlando Dam is situated within Soweto, directly south of the defunct Orlando Power Station and the well-known Soweto Towers (City of Johannesburg). The dam falls between the residential areas of Nancefield in the south-west and in Masopha in the north. Mbambisa Road (constructed in 2011) traverses the wetland downstream of the Orlando Dam. The dam falls within the quarter degree square 2627BD.

Figure 1: Google Earth aerial imagery of the dam and surrounding vegetation from 2000, 2004, 2006, 2010, 2011 and 2019 show the continuous soil disturbances around the dam over time

The SEF 2004 and 2009 reports indicated that the site is degraded and dominated by invasive species. Since the drafting of these reports the site vegetation has remained in a degraded state while numerous additional weeds have since colonised the site.

Figure 7a: Cattle grazing the vegetation north of the dam wall and ; (Figure 7b) kikuyu sods harvested from site

Figure 7c: Vegetation north of the dam wall- ditches and invasive plant species were common.

Figure 8) Bare soils on the dam wall

Figure 9: Eroded dam wall

Please note: The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

Are there any rare or endangered flora or fauna species (including red list species) present on the site	**Yes**	**No**

If YES, specify and explain:

7.2 Regional Vegetation Description & Threatened Ecosystems

The site is situated within the Grassland Biome that experiences summer rainfall and dry winters with frost (and fire), which are unfavourable to tree growth. Therefore, grasslands comprise mainly of grasses and plants with perennial underground storage organs, for example bulbs, tubers and suffrutex species. In some grassland areas, the surface topography (e.g. rocky hills and protected valleys) creates habitats that are favourable to shrublands and trees (Mucina & Rutherford, 2006). The grassland biome is under severe threat from urbanisation, industrialisation, mining and agriculture, especially in Gauteng. The site is situated in the Soweto Highveld Grassland vegetation type that is classified as Endangered as the extent conserved is less than the targeted extent that should be conserved (Mucina and Rutherford, 2006) (Figure 10).

Figure 10: The site falls within the historic extent of the Soweto Highveld Grassland.

7.2.1 Gauteng Conservation Plan.

According to the Gauteng Conservation Plan (version 3.3), the Orlando Dam forms part of an Ecological Support Area (ESA) and surrounding grassland falls within a Critical Biodiversity Area (CBA): Important (Figure 4). The Gauteng Conservation Plan (Version 3.3) (GDARD, 2011) classified areas within the province based on its contribution to reach the conservation targets within the province.

These areas are grouped as Critical Biodiversity Areas (CBAs) or Ecological Support Corridors (ESAs). The CBAs comprise 'Irreplaceable' areas that must be conserved and areas classified as 'Important' to reach the conservation targets of the Province. ESA's are areas that are not essential for meeting biodiversity representation targets/thresholds but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. (ESAs) to ensure sustainability in the long term, refer to Figure 11

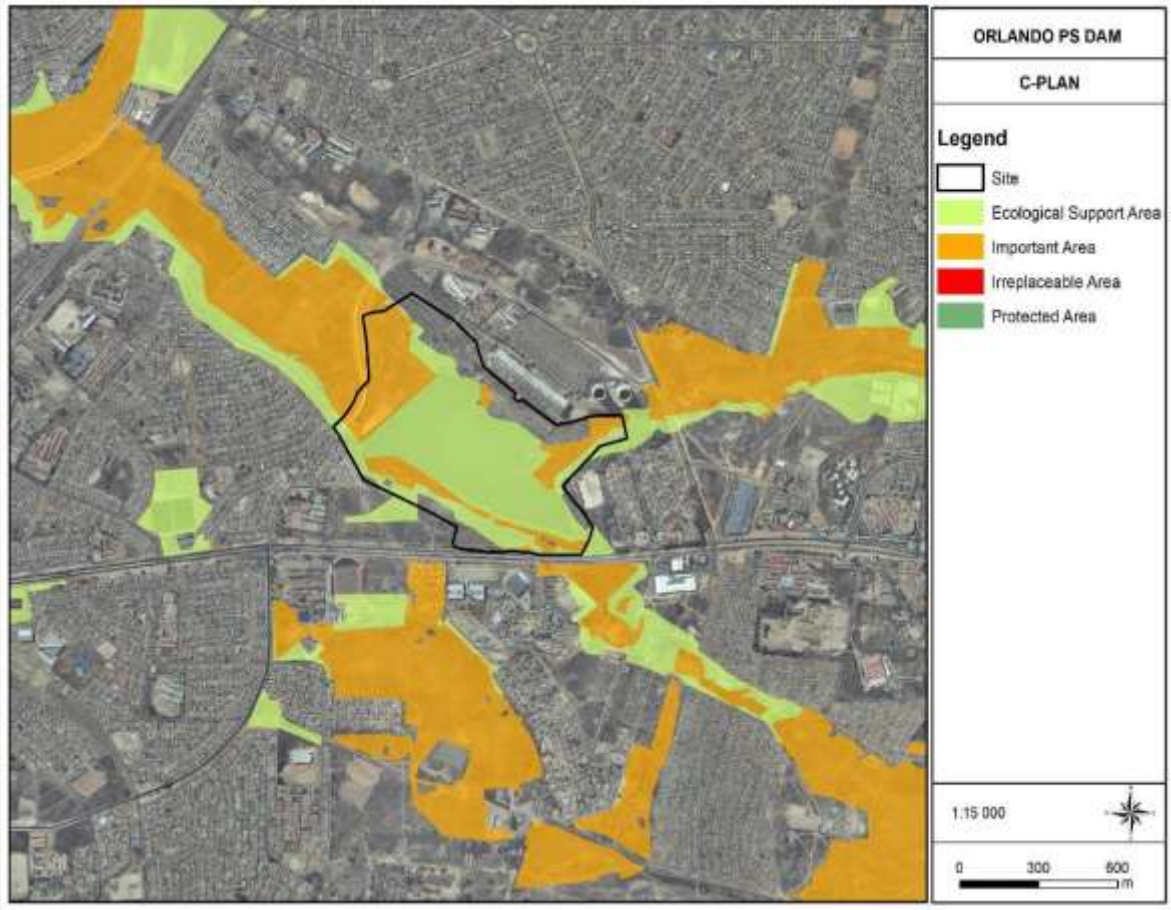

Figure 11: As per the Gauteng Conservation Plan, the Orlando Dam forms part of an ESA and CBA: Important

7.2.2 Gauteng Ridges

The Orlando Dam is situated north of a Class 2 ridge, which will not be impacted on by the proposed rehabilitation activities (Figure 12). Ridges are protected environments within Gauteng (GDACE, 2006). The term ridge refers to hills, koppies, mountains, kloofs and gorges and/or a landscape type or topographic feature that is characterized by two or more of the following features: a crest, plateau, cliff or footslope. Many threatened species of plants and animals inhabit ridges. As such, the conservation of ridges in Gauteng will contribute significantly to the future persistence of

these species. Ridges are thus of conservation concern and development within such areas are restricted, depending on the classification of each ridge. The Gauteng Development Guideline for Ridges (GDACE, 2006) classified ridges into four classes based on the percentage of the ridge that has been transformed.

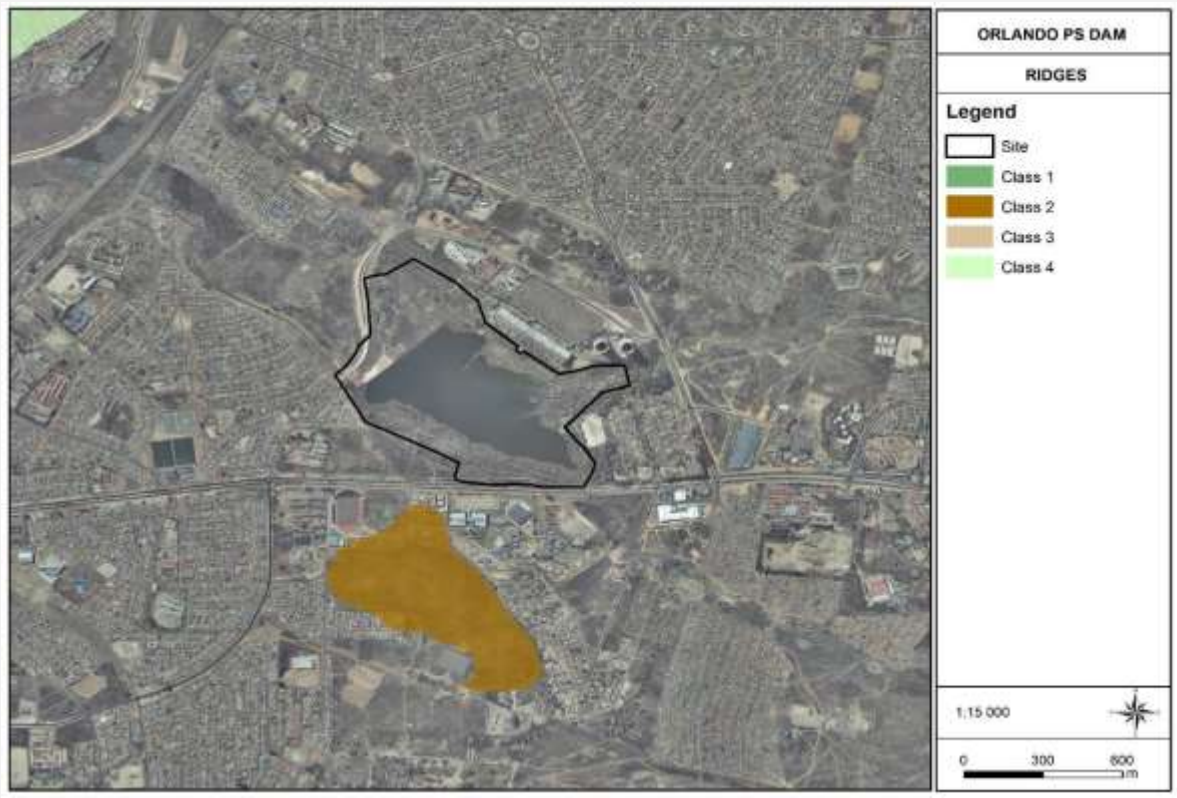

Figure 12: The Orlando Dam is situated in proximity to Class 2 ridge

7.2.3 Site Vegetation

Most of the vegetation that will be impacted on by the dam rehabilitation was classified as moderately to severely modified form the reference state of Soweto Highveld Grassland. The vegetation was mapped to a 100m buffer around the project area as follows:

Watercourse vegetation:

- *Phragmites asutralis vegetation*
- *Typha capensis-Mirabilis jalapa vegetation*

Severely modified moist grassland

Modified to severely modified grassland

The vegetation is geographically represented in Figure 13 and Appendix A and discussed below. Built-up areas or where historic structures were demolished was mapped as no natural habitat /

built-up and not discussed further. Species recorded in each vegetation group is listed in Appendix B of the vegetation assessment report attached within Appendix G.

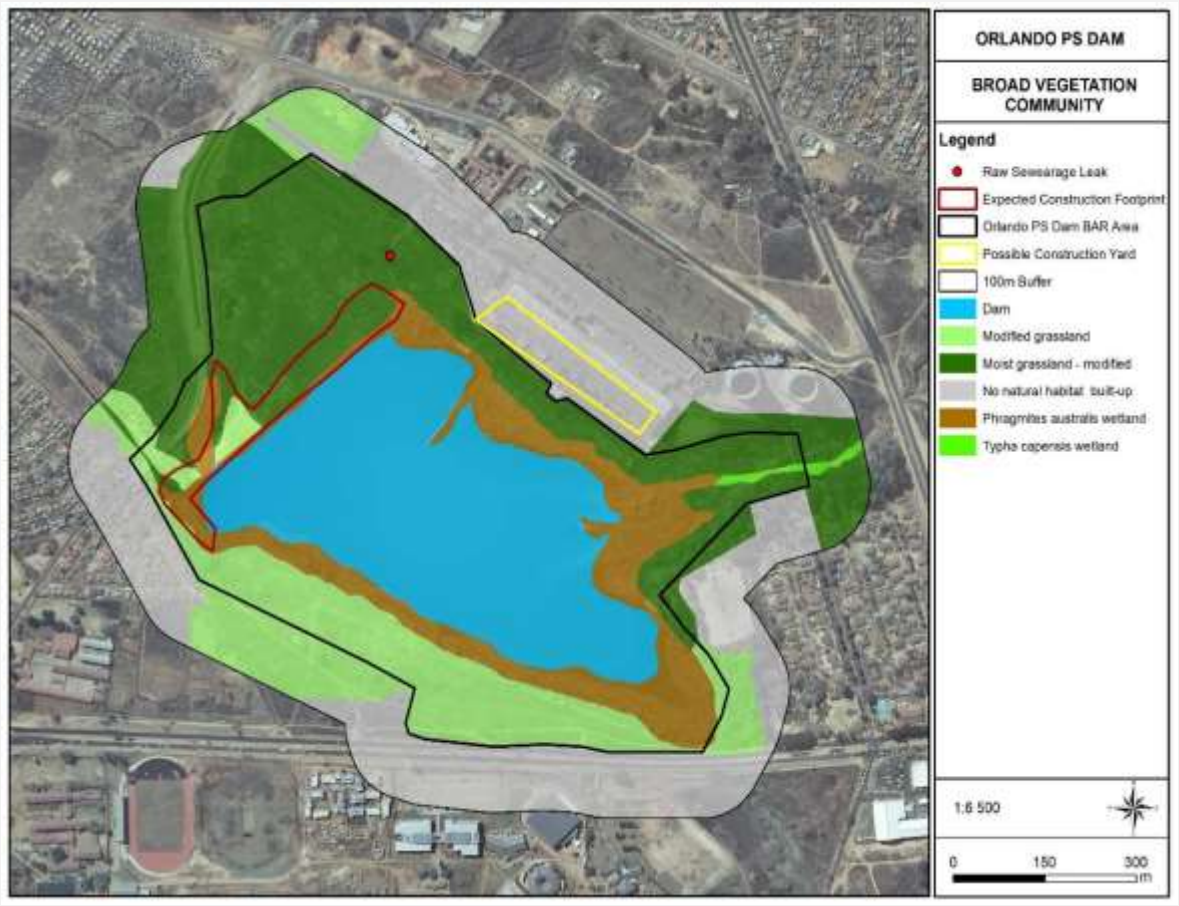

Figure 13: **Vegetation groups within 100m around the dam**

7.2.3.1 Watercourse vegetation

According to the National Water Act (Act No.36 of 1998), a watercourse means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which, water flows.

Two watercourses drain into the Orlando Dam. The permanently wet areas were grouped based on the dominant species present and discussed below. No plant species of conservation concern were recorded in the watercourse vegetation, although such species may be present.

Phragmites australis vegetation

The dominant grass around the dam, as well as the watercourses flowing into the dam from the east and south-east, was the tall growing *Phragmites australis* (common reed) (Figure 14). Small pockets, mainly areas where water flows out of the dam or into the dam included the reed *Typha capensis* (bulrush). Phragmites plays an important role in wetlands, particularly disturbed or impacted wetlands as it has an extensive root system that binds soils and prevents erosion. It can withstand high levels of environmental contamination and can assimilate heavy metals, nitrogen

and phosphorous (Tarr, 2006).

Other grasses included species such as *Paspalum dilataum* and the invasive *Pennisetum clandestinum* (kikuyu). Exotic trees such as *Salix babylonica* (willow) and *Ligustrum* species (privet) were recorded.

The *P. australis* vegetation is in a natural state as this species tends to form dense stands allowing little if any forb species to grow.

Figure 14: a) *P australis* in the pond underneath the dam overflow north of the dam wall, b) *P australis* in the spillway, c) around the edge of the dam and d) at the inflow of the Diepkloofspruit at Chris Hani Road.

Typha capensis-Mirabilis jalapa vegetation

The non-perennial river draining into the Orland Dam from the east was dominated by the indigenous reed *Typha capensis* (bulrush) in the permanently wet areas (Photograph 15a). However, the vegetation was invaded by numerous alien and invasive plant species, with the category 1b invasive shrub *Mirabilis jalapa* (four-o'clocks), being the most dominant on either side of Sheffield Road that traverses the watercourse (Figure 15b). This invasive species was not noted during the historic vegetation assessments of the site (SEF, 2004 & 2009) and has since emerged as the dominant species in the area.

Invasive species outnumbered indigenous vegetation with limited indigenous species such as *Cynodon dactylon (couch grass), Hyparrhenia hirta and the reeds Schonoplectus corymbosus and*

Juncus effuses present. Other than M jalapa, the most common invasive species were *Pennisetum clandestinum (kikuyu), Solanum mauritianum (bugweed), Amaranthus hybridus (pigweed), Nasturtium officinale (watercress), Melilotus alba (bokhara clover) and Ricinus communis (castor oil).*

The species composition of this vegetation is modified from typical highveld wetland vegetation. However, the degraded vegetation plays a role in flood attenuation and soil stabilisation.

Figure 15: a) *Typha capensis* patches west of Sheffield Road and b) invasive species dominated vegetation east of the Sheffield Road

7.2.3.2 Moist grassland

Moist grassland surrounds the dam and the watercourse. Here the soil moisture is elevated due to wetland conditions and sewerage leaks. Some plant species are adapted to temporary or permanently inundated soil conditions and grows in the moist grassland.

The moist grassland north of the dam wall is grazed and subsequently dominated by *Cynodon dactylon* (Figure 16). Other indigenous grasses include *Hyparrhenia hirta* (common thatch grass

and *Eragrostis plana* (tough love grass). Much of the vegetation was dominated by alien invasive plant species. The dominant spreading grass was the invasive *Pennisetum clandestinum* (kikuyu). Forbs were also weedy in nature e.g. *Plantago lanceolata, Centella asiatica* (marsh pennywort) and the category 1b invasive species *Cirsicum vulgare* (Scotch thistle), *Verbena bonariensis, Flavernia bidentis* (smelters bush) and a dominance of the emergent weed *Verbesina encelioides* var *encelioides* (wild sunflower).

Figure 16: Alien invasive species dominate the moist grassland a) west of Mbambisa Road, b) and c) along the dam wall and north-west thereof

The moist grassland is modified from natural wetland vegetation in the Highveld. However, the vegetation is the typical result of increased stormwater or sewerage, soil disturbances, erosion and colonisation by invasive plant species in an urban environment. No plant species of conservation concern are expected to be present due to the historical disturbances in the area (see section 4.3). Even though parts of the moist grassland north of the dam wall is classified as a CBA: Important, it is not in a primary state.

7.2.3.4 Modified grassland

Modified landscapes are regarded as areas where the vegetation structure and composition have been compromised and are not representative of the reference state, in this case, Soweto Highveld Grassland (SANBI, 2016). However, ecological function continues, albeit in an altered way. These

areas usually support a low species diversity. Modified land can range from moderately modified to severely or irreversibly modified. Subsequently, these areas are usually of a poor to fair ecological condition. The drier grassland surrounding the dam and moist grassland was historically disturbed and vegetation clearance took place in various portions (Figure 6; SEF 2004 and 2009). Indigenous grass species colonised the disturbed land, along with weedy pioneer species (Figure 17). Parts of the grassland have reached a secondary state; however, the forb and grass diversity remained low. The grassland is regularly mowed and grazed. Trampling and dumping were also noted.

Figure 17: Modified grassland downstream of the dam wall a) west of Mbambisa Road, b) east of the road c) on top of the dam wall (dominated by *Cynodon dactylon)* and d) modified grassland just north of Chris Hani Road.

The grass layer was dominated by the indigenous pioneer grass *Cynodon dactylon* (couch grass) and *C nlemfuensis* (star grass), which were likely planted as part of the post construction rehabilitation of Mbambisa Road. Other indigenous grasses include *Hyparrhenia hirta* (common thatch grass), *Eragrostis curvula* (love grass), *Panicum repens* and limited *Digitaria eriantha* (finger grass) and *Eragrostis plana* (tough love grass). The forb layer was dominated by the weedy *Plantago lanceolata* and patches of *Conyza podocephala.* Other species include *Cleome gynandra* (African cabbage), *Tribulus terrestris* (common devil's thorn), *Lactuca inermis* (wild lettuce), *Gomphocarpus fructicosus* (milk weed) and *Nidorella hottentottica* (refer to Appendix B of the vegetation report attached within Appendix G of this report).

The species diversity was poor and altered from the reference state of Soweto Highveld Grassland (see Table 1 of the vegetation report attached within Appendix G of this report). However, the grassland maintains its function as an ESA although it is unlikely to support plant species of conservation concern.

7.2.3.5 Provincially Protected Plants

At the time of this assessment, no TOPS listed species were recorded within the proposed development footprint or are expected to occur.

7.2.3.6 Alien Invasive Plant Species

Declared weeds and invader plant species have the tendency to dominate or replace the canopy or herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of natural ecosystems. Therefore, it is important that these plants are controlled and eradicated by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species (Henderson, 2001).

The alien plant species identified east of the dam wall are listed below.

Table 5: Category 1b alien invasive species recorded on and around the site

Species	Common name	Main are of occurrence
Araujia sericifera	Moth catcher	West of dam along fences
Argemone ochroleua	Mexican Poppy (White)	Modified grasslands
Cirsium vulgare	Scotch Thistle	Modified grassland and -moist grassland, north of dam wall
Cuscuta campestris	Common Dodder	Modified grassland south of dam
Datura stramonium (M)	Thorn-apple / Olieboom	Modified grassland and -moist grassland, north of dam wall
Eucalyptus camalduensis	River buegum	Moist grassland and surrounds
Ipomoea purpurea	Morning Glory	West of dam along fences
Mirabilis jalapa	Four-o'clocks	Moist grassland (dominant species)
Pennisetum clandestinum	Kikuyu Grass	Moist grassland and modified grassland (a dominant species)
Solanum mauritianum	Bugweed	Moist grassland
Solanum sisymbrifolium	Wild Tomato	Modified grassland
Verbena bonariensis	Wild Verbena	Moist grassland
Verbena officionalis	Verbain	Moist grassland
Verbesina encelioides var encelioides *Emerging weed proposed Category 1b*	Wilde Sonneblom	Moist grassland (dominant species)

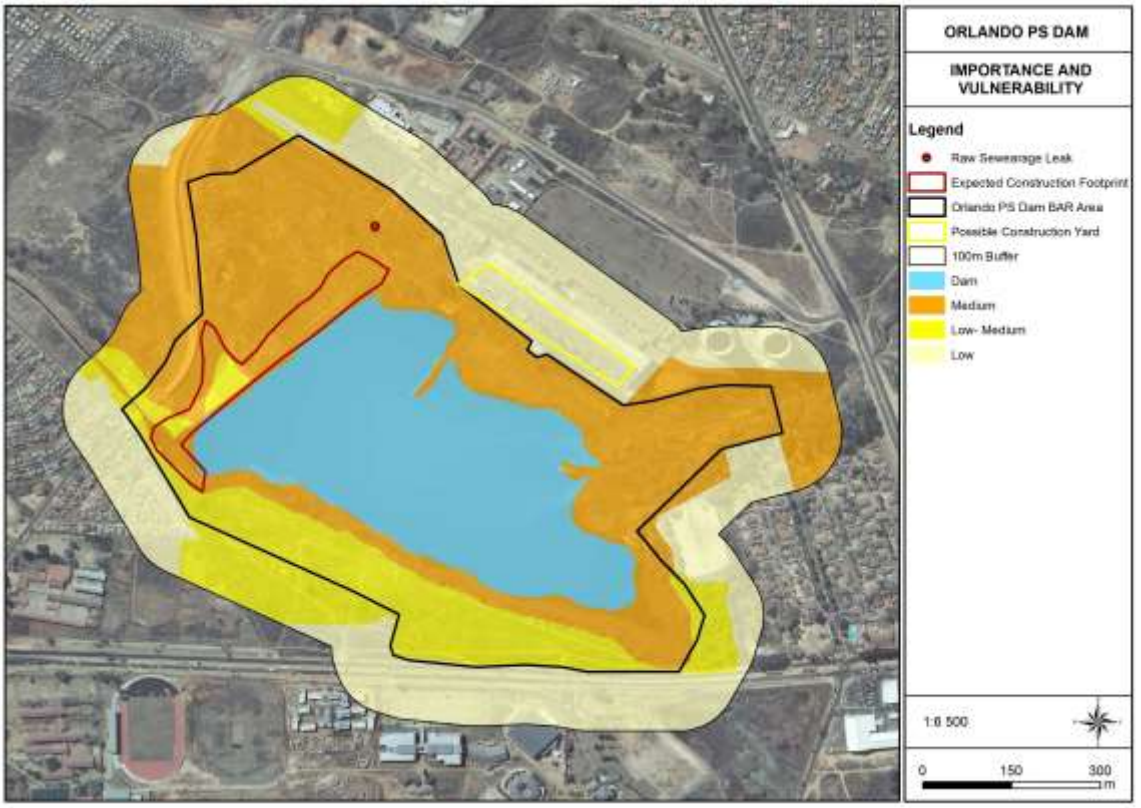

Figure 18. Vegetation sensitivity on Site

For details refer to the Vegetation Assessment Report attached within Appendix G of this Report.

7.3 Fauna - Findings of the field assessment

7.3.1 Terrestrial Fauna

Surrounding areas are fairly densely developed and ecological connectivity is limited to the east and west along the river. Developments include formal and informal housing, industrial, community and tourism developments such as the canoe and adventure club associated with the decommissioned cooling towers.

No mammals were noted on site, but scat for two species were noted. Based on the characteristics of the scat and overall habitat characteristics it is suspected to belong to the following two species:

- Southern African Hedgehog (*Atelerix frontalis*) (GN151 Protected; RL Near Threatened; GP Protected Game). The species feeds predominantly on invertebrates and may play an important role in pest control. The most severe threats are habitat loss, degradation and fragmentation from urban sprawl and agriculture. Also threatened by illegal harvesting from the wild for food, or for sale as pets and traditional medicine (Light et al., 2016).

- Common Duiker (*Sylvicapra grimmia*). The Common Duiker is an important prey base for several carnivores (Birss et al., 2016).

7.3.3.2 Mammal Species of Conservation Concern

No TOP or endemic species were noted on site. The habitats are generally not in a pristine state and the ecological corridor is fairly narrow and very exposed in the western area. This, along with the fact that the immediate area and the surrounds are well-populated (species prone to persecution by people and domestic animals) and developed means that many TOPS are unlikely in the greater area and won't reside in the development area for any length of time. Therefore many TOP species with distributions over the development area are unlikely to occur in the area.

7.3.4 Birds

The following TOP and Endemic Species are likely to occur on site:

- Lesser Kestrel (Falco naumanni) (GN151 Vulnerable). As an insectivore, the species may contribute to control of invertebrate populations. Mainly faces threats in Europe and Asia, but also threatened by control of insects through pesticides, felling of tall trees and collisions with vehicles (Taylor et al., 2015).

- Yellow-billed Stork (Mycteria ibis) (RL Endangered). Species feeds on fish, frogs, insects, worms and crustaceans. Ecosystem services are limited but may contribute to aquatic pest control and possibly control of AI fish. Threats include loss of wetland habitats, including wetland systems of pans, marshes and floodplains. Loss of suitable trees for roosting/nesting also threatens species (Taylor et al., 2015).

- Endemic Eastern Long-billed Lark (*Certhilauda semitorquata*). Species feeds on insects and seeds and may provide limited seed dispersal. Species may also contribute to control of invertebrate numbers with other insectivores (Taylor et al., 2015).

Endemic Greater Double-collared Sunbird (*Cinnyris afer*). Species feeds on nectar and also insects and spiders. Species is a pollinator. Species may also contribute to control of invertebrate numbers with other insectivores (Taylor et al., 2015).

No TOPS or endemic species were observed on site, and only a few were recorded for the pentad or likely to occur on site. Therefore the immediate area is unlikely to support significant TOP bird

7.3.5. Reptiles and Frogs

Many reptiles and frogs are insectivores and contribute to control of invertebrate populations with other insectivorous species. They are also prey-base for many animals. No significant TOP Hepertofauna populations are expected on site. The specific site is not considered significant in terms of maintaining endemic herpetofauna populations. No frogs or reptiles were noted on site.

Due to the existing status of the site, no fatal flaws or special recommendations are relevant and no additional faunal assessments or studies are required. From a terrestrial fauna perspective, there is no reason for not authorizing the activity as impacts to terrestrial fauna are minor and can be mitigated to low significance as long as the following proposed conditions are met:

- The managing body of the Klipriviersberg Nature Reserve must be included within the public participation process and any requirements included within the final EMPr.
- Wetlands and rivers must be managed in terms of the wetland report and also in line with the requirements of the water use authorization.
- Integrate all mitigation measures and monitoring requirements of this report and the vegetation report into the EMPr and operational procedures.

In terms of the terrestrial fauna, if the above conditions are met there should be no reason not to authorise the activity. Refer to Appendix G of this report for the Fauna Assessment Report

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.	[redacted] No

If YES, specify and explain:

Are there any special or sensitive habitats or other natural features present on the site? If YES, specify and explain:	**Yes**□ [redacted]

Wetland (An Ecological Sensitive Habitat)

The watercourse recorded on the site was classified as a large dam area constructed on the confluence of two small channelled valley bottom wetlands (Figure 19). When the water exits the constructed dam it forms an unchannelled valley bottom wetland with elements of floodplain wetland characteristics. The aforementioned area is thus described as a dam within a wetland system. The construction of the Orlando Power station started in 1939 and the wetland has thus

been impacted on for 81 years or longer. Not only does the wetland have numerous impoundments, trenches but it also has numerous storm water drains and canals entering and exiting the wetland. Leaking sewerage is also an issue. The system is subsequently greatly altered from the theoretical natural state. The hydrology, geomorphology and vegetation has changed significantly, however, the wetland and dam provide habitat and breeding ground for a variety of faunal species, especially for avifauna species.

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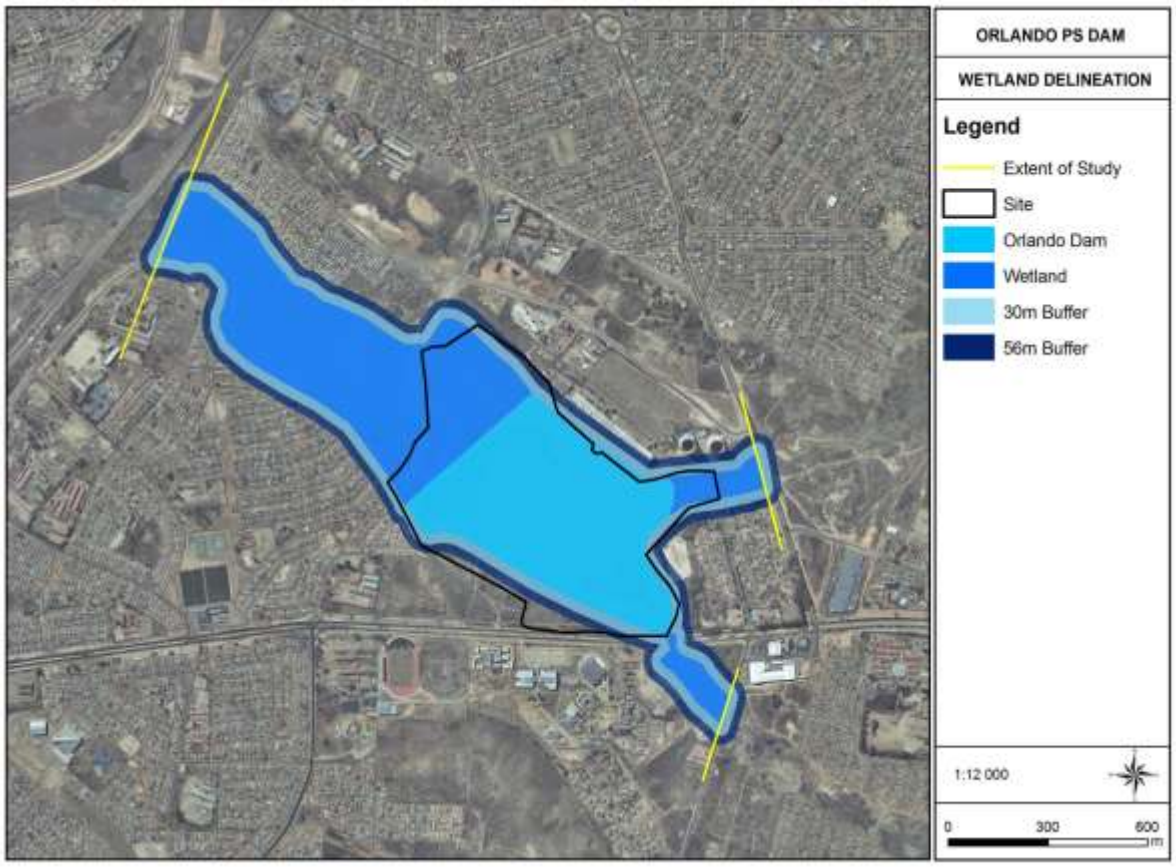

Figure 19: Dam and associated wetland and their associated buffer zone.

Wetland Vegetation

The vegetation associated with the wetland is similar to that usually found in the disturbed wetlands in parts of Johannesburg. Some woody vegetation was recorded in the wetlands flowing into the dam, these include Salix babylonica, *Eucalyptus grandis*, *Ligustrum sp*. The wetlands were also characterised by large areas of subsistence farming on the banks of the streams. These areas, if not actively used for farming, are usually dominated by exotic species. The dominant wetland vegetation include the cosmopolitan pioneer *Phragmites australis* which is known to colonises areas with high sedimentation rates, as well as *Typha capensis* (Bullrushes). Large areas were colonised by the invasive grass *Pennisetum clandestinum* Kikuyu Grass) and the indigenous wetland grass *Paspalum dilatatum*. Other exotic species recorded on the study include *Mirabilis jalapa, Solanum mauritianum, Ricinus communis*, *Nasturtium officinale, Cortaderia selloana*,

Tagetes minuta, Arundo donax, Verbena bonariensis, and Amaranthus hybridus (Figure 20).

Figure 20: General characteristics of the wetland in the study area including invasive trees

Present Ecological Status (PES)

The wetland scored a PES of E - Largely modified. The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable. The wetland conditions recorded on the study site are likely to remain stable over the next 5 years. This is due to the prolonged altered state of the wetland area, although it is likely that the vegetation composition will deteriorate slightly over the next 5 years given the amount of exotic species located on the study site that tend to grow into dense exclusive stands. The scores are summarised in Table 3 of the Wetland Assessment Report attached within Appendix G.

Ecological Importance and Sensitivity (EIS)

The EIS score of 1.3 for the wetland falls into a category characterised by Moderate ecological importance and sensitivity. Wetlands that fall into this category are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these wetlands is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water in major rivers (DWAF, 1999). The dense stands of vegetation are likely to contribute in some degree to the hydro-functionality of the wetland and is likely to enhance water quality to some degree although it is likely still very much pollute and unsuitable for human consumption or use explaining the low score for human benefits refer to (Table 4) of the wetland specialist report attached within Appendix G.

Was a specialist consulted to assist with completing this section	**Yes** ☐

If yes complete specialist details

1.) Wetland Specialist

Name of the specialist:	Antoinette Bootsma		
Qualification(s) of the specialist:	B. Sc (Botany & Zoology) University of South Africa (1997 - 2001), B. Sc (Hons) Botany University of Pretoria (2003-2005), MSc Ecology, University of South Africa (2010 - on-going), Short course in wetland delineation, legislation and rehabilitation, University of Pretoria (2007) and Short course in wetland soils, Terrasoil Science (2009).		
Postal address:	P.O. Box 32733, Waverley, Pretoria		
Postal code:	0135		
Telephone:	012 543 9982	Cell:	083 4545 454
E-mail:	antoinette@limosella.co.za	Fax:	

Are any further specialist studies recommended by the specialist?	**NO** ☐
If YES, specify:	**N/A**
If YES, is such a report(s) attached?	**NO** ☐
If YES list the specialist reports attached below	**N/A**

Signature of specialist:		Date:	**10th February 2020**

Please note; if more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated

2.) Vegetation Specialist

Name of the specialist:	Antoinette Eyssell-Knox
Qualification(s) of the specialist:	▪ Highest qualification: MSc Environmental Science (2010), University of Pretoria ▪ Professional membership: SACNASP Pr Sci Nat (400019/11) Ecological Science
Postal address:	Dimela Eco Consulting P.O box 72847 Lynnwood Ridge, Pretoria
Postal code:	0040

Tel		Cell:	083 642 6295
E-mail:	Antoinette@dimela-eco.co.za	Fax:	

Are any further specialist studies recommended by the specialist? NO □

If YES, specify: **N/A**

If YES, is such a report(s) attached? NO □

If YES list the specialist reports attached below

N/A

Signature of specialist: 

Date: **21st January 2020**

3.) Fauna Specialist

Name of the specialist:	Barbara Kasl
Qualification(s) of the specialist:	▪ Highest qualification: Holds a PhD in Animal, Plant and Environmental Sciences from the University of the Witwatersrand; ▪ Is a registered SACNASP Professional Ecological and Environmental Scientist (Pr.Sci.Nat. Registration ▪ No.: 400257/09), with expertise in faunal ecology; ▪ Has been actively involved in the environmental consultancy field for over 12 years; and ▪ Is a member of the Entomological Society of South Africa.
Postal address:	Dimela Eco Consulting P.O box 72847 Lynnwood Ridge, Pretoria
Postal code:	0040
Tel	
Cell:	
E-mail:	bk.zoology@gmail.com
Fax:	

Are any further specialist studies recommended by the specialist? NO □

If YES, specify: **N/A**

If YES, is such a report(s) attached? NO □

If YES list the specialist reports attached below

N/A

Signature of specialist: 

Date: **28th January 2020**

4.) Heritage Specialist

Name of the specialist:	J A van Schalkwyk (D Litt et Phil),		
Qualification(s) of the specialist:	▪ BA. - 1976 ▪ BA. (Hons.) Archaeology - 1978 - (with distinction) ▪ Post Graduate Diploma in Museum Science - 1979 ▪ BA. (Hons.) Anthropology - 1981 - (with distinction) ▪ MA. Anthropology - 1985 ▪ D. Lit et Phil (Anthropology) - 1996		
Postal address:	P O Box 28088, Sunnyside,		
Postal code:	0132		
Telephone:	(012) 324 6082;	Cell:	+27 082 3351288.
E-mail:	jcpvanwyk@absamail.co.za	Fax:	(012) 328 5173;

Are any further specialist studies recommended by the specialist? **NO** □

If YES, specify: **N/A**

If YES, is such a report(s) attached? **NO** □

If YES list the specialist reports attached below

N/A

Signature of specialist: 

Date: **03rd January 2020**

5.) Paleontological Specialist

Name of the specialist:	Doctor Heidi Fourie)		
Qualification(s) of the specialist:	Ph.D Palaeontology		
Postal address:	P O Box 28088, Sunnyside,		
Postal code:	0132		
Telephone:	012 322 7632	Cell:	079 940 6048
E-mail:	heidicindy@yahoo.com	Fax:	

Are any further specialist studies recommended by the specialist? **NO** □

If YES, specify: **N/A**

If YES, is such a report(s) attached? **NO** □

If YES list the specialist reports attached below

N/A

Signature of specialist: 

Date: **18th February 2020**

8. LAND USE CHARACTER OF SURROUNDING AREA

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site

Proposed Activity:

1. Vacant land	**2. River, stream, wetland**	3. Nature conservation area	**4. Public open space**	**5. Koppie or ridge**
6. Dam or reservoir	. Agriculture	8. Low density residential	**9. Medium to high density residential**	10. Informal residential
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial[AN]	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport[N]	23. Train station or shunting yard[N]	24. Railway line[N]	25. Major road (4 lanes or more)[N]
26. Sewage treatment plant[A]	27. Landfill or waste treatment site[A]	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33.Spoil heap or slimes dam[A]	34. Small Holdings	
Other land uses (describe):	**Existing dam**			

NOTE: Each block represents an area of 250m X 250m, if your proposed development is larger than this please use the appropriate number and orientation of hashed blocks

Site

NORTH

8	**8**	**8**	**8**	**2**
8	**1**	**1**	**4,2**	**8**
2,8	**1,2**	**2**	**1,8**	**2**
1	**1**	**1**	**1**	**8**
4, 2	**1**	**8**	**8**	**8**

WEST EAST

SOUTH

Note: More than one (1) Land-use may be indicated in a block

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an "[A]" and with an "[N]" respectively.

Have specialist reports been attached **YES**

If yes indicate the type of reports below

- Vegetation Assessment Report
- Fauna Assessment
- Wetland Assessment Report
- Heritage Impact Assessment Report
- Paleontological Desktop study

The above specialists reports are attached within **Appendix G** of this report

9. SOCIO-ECONOMIC CONTEXT

Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

Introduction: The study site is located in the suburb of Orlando East in Soweto, City of Johannesburg, Gauteng Province (Figure 1). The dam located south of the Orlando Power Station and the Soweto Towers. It is bordered in the south by the M68 road. The approximate coordinates of the study area are 26°15'16.88"S and 27°55'9.76"EThe City of Johannesburg Local Municipality is situated in Gauteng province and covers an area of 1645km². The City of Johannesburg Local Municipality is divided into seven regions, designated alphabetically from A to G. The proposed development is located within **Region D**.

Population: The City of Johannesburg has a population of approximately 4.4 million people made up primarily of a young population aged between 30 and 39 years. The total population translates into roughly 1.4 million households with an average household size of 3 persons. At a regional level, Region D is the most densely populated region in the City with 24.4% followed by Regions G (16.7%), F (13.4%), A (12.6%), E (11.8%), **C (11.6%)** and B (9.4%) respectively. In terms of gender, 50.2% of the population is male and 49.8% is female. Majority of the population are black (76.4%), followed by 12.3% white, 5.6% coloured, 4.9% Indian, and 0.8% other. The predominant languages within the City are Zulu (23.1%), followed by English (19.8%) and Sotho (9.5%).

Economic Profile: The City of Johannesburg's economy is driven primarily by four economic sectors which are: (a) finance and business services, (b) community services, (c) manufacturing, and (d) trade. These four economic sectors collectively account for more than 82% of economic activity within the City. These sectors also account for the highest levels of formal and informal employment. This state of affairs suggests that the City of Johannesburg's economy is highly concentrated; making it vulnerable to sudden external shocks such as the recession experienced during 2008/09. Every opportunity should therefore be explored to diversify the economy into other sectors in which the City enjoys a comparative advantage.

Employment

The City has a high unemployment level of 25%. Of the 1 228 666 economically active youth (15–35 years), 31.5% are unemployed. Regional analysis shows that Region D had the highest level of unemployment (42.7%) followed by Regions G (28.1%), F (26.2%) and A (15.7%). Regions E, B and **C** have the lowest rates of unemployment at 2.3%, 9.2% and **11.7%** respectively. Youth unemployment remains a major challenge both nationally and for the City. Low education levels and slow formal sector growth are two of the major causes of youth unemployment. The vast majority of the youthful population in Johannesburg has only a matric certificate preventing access to the labour market (CoJ IDP 2012/2016).

Education

In terms of education within the City of Johannesburg Local Municipality, of those 20 years and older 3.4% have completed primary school, 32.4% have some secondary education, 34.9% have completed matric, 19.2% have some form of higher education, and 2.9% of those aged 20 years and older have no form of schooling

10. CULTURAL/HISTORICAL FEATURES

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as-
(a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
(b) the construction of a bridge or similar structure exceeding 50m in length;

(c) any development or other activity which will change the character of a site-

(i) exceeding 5 000 m2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources

authority;

(d) the re-zoning of a site exceeding 10 000 m2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest 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.

Are there any signs of culturally (aesthetic, social, spiritual, environmental) or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:	**NO** □

If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:

Heritage Findings

The findings of the Heritage Assessment are summarised below:

- It is classified as an ordinary earthen embankment dam, and exhibit no exceptional qualities in its design or construction;
- It cannot be related to any significant individual or event;

However,

- It is older than 60 years and therefore enjoy general protection under the National Heritage Resources Act, No. 25 of 1999;
- It originally formed part of the industrial heritage of the area as well as the larger region. Unfortunately, with the destruction of the power station, this link has also been broken;
- It has some significance to the local community, which is much involved in its maintenance and protection and is used by them for recreational purposes (bird watching, picnic, canoeing).

Heritage reasoned opinion as to whether the proposed activity should be authorised:

It is our considered opinion, based on the findings of the desktop research together with the fieldwork findings, that the danger posed by the lack of structural integrity of the dam wall is sufficient reason to implement the proposed remedial actions, and thereby protecting a heritage site of significance to the local community. In addition, the excessive plant growth around the dam limits its use for recreational purposes very much and should be contained.

Paleontological Findings

- All the land involved in the development was assessed and none of the property is unsuitable for development
- The following should be conserved: if any paleontological material is exposed during digging, excavating, drilling or blasting, SAHRA must be notified. All development activities must be stopped and a palaeontologist should be called in to determine proper mitigation measures, especially for shallow caves.
- Condition in which development may proceed: It is further suggested that a Section 37(2) agreement of the Occupational, Health and Safety Act 85 of 1993 is signed with the relevant contractors to protect the environment (fossils) and adjacent areas as well as for safety and security reasons.

Will any building or structure older than 60 years be affected in any way?	**NO** □
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	**NO** □

If yes, please attached the comments from SAHRA in the appropriate Appendix

SECTION C: PUBLIC PARTICIPATION (SECTION 41)

1. THE ENVIRONMENTAL ASSESSMENT PRACTITIONER MUST CONDUCT PUBLIC PARTICIPATION PROCESS IN ACCORDANCE WITH THE REQUIREMENT OF THE EIA REGULATIONS, 2014.

2. LOCAL AUTHORITY PARTICIPATION

Local authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least thirty (30) calendar days before the submission of the application to the competent authority.

Was the draft report submitted to the local authority for comment?	YES	NO

If yes, has any comments been received from the local authority?	YES	NO

If "YES", briefly describe the comment below (also attach any correspondence to and from the local authority to this application):

Please note that, this is the DBAR that is being release out to public and any comments that will be received will be added into the comments and response report.

1. **The Local ward councilors (Ward 25)**

   The Regional Head and local ward councilor were consulted and neither objection nor comment was received during the process notification period.

2. **City of Johannesburg (CoJ)**

   The DBAR has been submitted to the commenting authority and comments are expected during the DBAR review period.

3. **Department of Water and Sanitation**

   Comments are expected during the DBAR review period. A Water Use License application is underway.

   .

4. **Gauteng Department of Agriculture and Rural Development (GDARD).**

   The DBAR has been submitted to the competent/authorizing authority and comments are expected during the DBAR review period.

All comments and responses provided will be included in Appendix E6 Comments and Response Report.

If "NO" briefly explain why no comments have been received or why the report was not submitted if that is the case.

As this is the Draft Basic Assessment Report at present, it will be submitted for comment to the local authority and as well as to other stakeholders. Once comments have been received at the end of the 30-day review period, they will be recorded and reflected in the Final Basic Assessment Report. The following public participation was conducted for the proposed project:

Identification of stakeholders, including occupiers of the property, owners and occupiers of land adjacent to the site, municipal officials and relevant State Departments as part of the Public Participation Process. All respondents were placed on the project database. This database will be supplemented by I&APs who will contact the EAP to be included on the database. The database will be used throughout the process to inform the stakeholders of the project.

In order to canvass the issues and concerns of the broader public and to ensure that all IAPs are afforded the opportunity to comment on the proposed development, the proposed project was announced as follows:

- Erection of site notices, size (A2) advertising the proposed development and displaying the contact details of the EAP were prepared and displayed on-site. The site notices will serve the purpose of informing potential IAPs of the project and therefore afford them the opportunity to comment.
- Distribution of the notification letter with a registration and comment sheet, and the locality map to state departments and other potential stakeholders through emails.
- An advert was placed in the Soweto Urban Pimville Newspaper on 30th January 2020 2019 to notify the public about the Basic Assessment process, invite members of the public to register as I&APs on the project's database.
- Communication with local authorities and stakeholders
- A copy of the Draft Basic Assessment Report will be made available for public review for a 30 day review period at the Orlando East Library - Public library 6544 Rathebe St, Orlando East, Johannesburg.
- The DBAR will also be uploaded on Dropbox for the public to access.
- The DBAR will also be hand delivered to affected Organs of State
- A public meeting will be held during the DBAR review period
- Any further comments received during the public meeting and review period of the draft Basic Assessment as well as responses provided will be captured and recorded within the Comments and Response Report in the final Basic Assessment Report that will be submitted to GDARD.
- Once GDARD has made a decision on Environmental Authorization: The registered I&APs, stakeholders and organs of state will be notified of the department's decision.

3. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the activity, site or property, such as servitude holders and service providers, should be informed of the application at least **thirty (30) calendar days** before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders? **Yes**

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

The public were notified of the application, during the process notification period.

Most of the comments revolved around job opportunities that the development will provide to the local community and when construction is anticipated to commence. The majority of the IAPS also requested to be added on the project database. For details refer to the comments and response report attached within Appendix E6 and Appendix E4 for the direct correspondence with IAPs.

Additional comments are expected during the DBAR review period and also during the holding of the public meeting with the community.

If "NO" briefly explain why no comments have been received

4. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

The Environmental Assessment Practitioner must ensure that the public participation process is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees and ratepayers associations. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorization it may have issued if it becomes apparent that the public participation process was flawed.

The EAP must record all comments and respond to each comment of the public / interested and affected party before the application report is submitted. The comments and responses must be captured in a Comments and Responses Report as prescribed in the regulations and be attached to this application.

5. APPENDICES FOR PUBLIC PARTICIPATION

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below

Appendix is to be ordered as detailed below

Appendix 1 – Proof of site notice

Appendix 2 – Written notices to I&APs & Correspondences

Appendix 3 – Proof of newspaper advertisements

Appendix 4 –Authority Correspondence

Appendix 5 – Minutes of any public and/or stakeholder meetings – this is anticipated during the Draft BAR review period

Appendix 6 - Comments and Responses Report Attached as Appendix E6

Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report - Comments are anticipated during the Draft BAR review period

Appendix 8 –Comments from I&APs on amendments to the BA Report N/A

Appendix 9 – Copy of the register of I&APs

Appendix E10 - Comments from I&APs on the application (None)

SECTION D: RESOURCE USE AND PROCESS DETAILS

Note: Section D is to be completed for the proposal and alternative(s) (if necessary)

Instructions for completion of Section D for alternatives

1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed
4) Each alterative needs to be clearly indicated in the box below
5) Attach the above documents in a chronological order

Section D has been duplicated for alternatives	**0**	times	(Complete only when appropriate)

Section D Alternative No.		(complete only when appropriate for above)

1. WASTE, EFFLUENT, AND EMISSION MANAGEMENT

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES☐ ■
If yes, what estimated quantity will be produced per month?	Could not be determined at this stage m^3

How will the construction solid waste be disposed of (describe)?

Construction rubble/ solid waste will be temporarily stored on site in designated waste skips and then removed by an appropriate waste contractor appointed by the main construction contractor to an approved landfill site. This will be managed through the EMPr.

Where will the construction solid waste be disposed of (describe)?

General waste removed from site will be disposed of at a suitably licensed disposal facility. The nearest licensed landfill site is the FG Landfill site. Safe disposal certificates must be obtained and kept on site for the duration of the construction phase

Will the activity produce solid waste during its operational phase?	■ NO ☐
If yes, what estimated quantity will be produced per month?	`m^3

How will the solid waste be disposed of (describe)?

No solid waste will be produced during the operational phase of the proposed project.

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?	■ NO ☐

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

During construction a registered landfill sites e.g. Marie Louise landfill- Roodepoort can be used as they still have capacity and no waste will be generated during the operation phase.

Note: If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation? ■ NO □

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility? ■ NO □

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Describe the measures, if any, that will be taken to ensure the optimal reuse or recycling of materials:

During Construction, wastes must be separated at source into recyclable and non-recyclable materials and distributed for recycling where applicable. During the construction phase, construction waste rubble should be re-used as fill material and as foundation for the proposed rehabilitation processes where possible. The re-use of construction rubble and other waste materials will minimize the amount of waste that will need to be disposed of at registered municipal waste facilities.

Liquid effluent (other than domestic sewage)

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? ■ **NO** □

If yes, what estimated quantity will be produced per month? N/A m3

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)? YES NO

Will the activity produce any effluent that will be treated and/or disposed of on site? ■ **NO** □

If yes, what estimated quantity will be produced per month? N/A m3

If yes describe the nature of the effluent and how it will be disposed.

N/A

Note that if effluent is to be treated or disposed on site the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA

Will the activity produce effluent that will be treated and/or disposed of at another facility? ■ **NO** □

If yes, provide the particulars of the facility:

Facility name:	N/A		
Contact person:	N/A		
Postal address:	N/A		
Postal code:	N/A		
Telephone:	N/A	Cell:	

E-mail: N/A Fax:

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

N/A

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system? **YES**☐

If yes, what estimated quantity will be produced per month? Unknown at this state

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)? **NO**☐

Will the activity produce any effluent that will be treated and/or disposed of onsite? **NO**☐

If yes describe how it will be treated and disposed of.

Chemical toilets are going to be used and the sewage waste will be collected by the waste service provider for treatment at a treatment facility.

Emissions into the atmosphere

Will the activity release emissions into the atmosphere? **NO**☐

If yes, is it controlled by any legislation of any sphere of government? YES NO

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

The activity itself will not contribute directly to emissions released into the atmosphere except possible short-term dust emissions during the construction phase. Emissions generated will be in the form of dust, carbon dioxide and other vehicle emissions generated by diesel powered machinery and trucks during the construction process i.e. tip trucks, TLB's, excavators and dust from the movement of the construction vehicles. These emissions will be composed primarily of CO_2 and will be of a low concentration.

2. WATER USE

Indicate the source(s) of water that will be used for the activity

Municipal	Directly from water board	groundwater	river, stream, dam or lake	other	the activity process itself will not use water

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate
the volume that will be extracted per month: litters

If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix

Does the activity require a water use permit from the Department of Water Affairs? **YES**☐

If yes, list the permits required

A Water Use License is required for the following Section 21 water uses:

- Storing water;

- Impeding or diverting the flow of water in a watercourse;
- Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- Disposing of waste in a manner that may detrimentally affect a water resource; and
- Altering the bed, banks, course or characteristics of a watercourse.

However, regarding the above, it is reported that the dam exists and therefore already authorized for some activities listed in Section 21 of the Water ACT, e.g. (21b), the DWS will have to advise us on that during the pre-consultation meeting.

If yes, have you applied for the water use permit(s)?		**NO** □
If yes, have you received approval(s)? (attached in appropriate appendix)	YES	NO

The Integrated Water Use License Application (IWULA) has been initiated on the DWS online portal. The DBAR will also be made available to the Department of Water and Sanitation for comment during the DBAR review period.

3. POWER SUPPLY

Please indicate the source of power supply e.g. Municipality / Eskom / Renewable energy source

The development will not require power supply during its operation phase. However generators will be used as a source of power if needed during the construction phase.

If power supply is not available, where will power be sourced from?

Please see above.

4. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

No particular considerations of energy saving/ conservation were deemed applicable in this project. However, the scope of work will be structured in a way that, where possible, the use of labour intensive methods will be employed. Not only will it serve the local community but it also saves the use of Pneumatic Equipment that requires a lot of energy input.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

The proposed development is not an energy-intensive development that will require energy/electricity input for its continued operations and will therefore not consume energy during its operation phase.

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts as well as the impacts of not implementing the activity (Section 24(4) (b) (i).

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summaries the issues raised by interested and affected parties.

Summary of main issues raised by I&APs	Summary of response from EAP
Will the project provide job opportunities to us from the local community	Yes, the proposed development will create jobs opportunities during the construction phase; these employment opportunities will target local community members. The ward councilor will be informed of this development and he will make arrangements of how you get the job opportunities from the project
Any job opportunities now	Not at this stage the developer is still procuring permits e.g. environmental permit before they may start construction.
When is construction expected	Construction is anticipated later this year
How long will construction last for?	The expected duration of construction is twelve (12) months.
Will the project have any impacts on our households	The impacts will be assessed in the draft basic assessment report (DBAR). You will be informed of the availability of this report once it is ready for public review it will be placed at the nearest local library and also on drop box. The impacts are expected to be minimal as the facility already exists within the Hospital premises. All identified impacts will have control measures in place to minimize the significance of the impacts. The mitigation measures will be contained with the environmental management programme (EMPr)

	which will become a legal binding document to the developer once the project is approved. Additionally an independent environment control officer will be required to monitor the implementation of this EMP and the environmental authorization once issued

As this is the Draft Basic Assessment Report at present, it will be submitted for comment to the local authority and as well as to other stakeholders and the public. Any additional comments that will be received at the end of the 30-day review period will be recorded and reflected in the Final Basic Assessment Report.

Summary of response from the practitioner to the issues raised by the interested and affected parties (including the manner in which the public comments are incorporated or why they were not included)
(A full response must be provided in the Comments and Response Report that must be attached to this report):

Refer to the table above

2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION AND OPERATIONAL PHASE

Briefly describe the methodology utilized in the rating of significance of impacts

The purpose of impact assessment is to assign relative significance to predicted impacts associated with the project, and to determine the manner in which impacts are to be avoided, mitigated or managed. The potentially significant environmental impacts were identified based on the nature of the receiving environment, a review of the proposed activities, and the issues raised in the public participation process.

The potential impacts of the proposed development were identified through a site visit, the Environmental Assessment Practitioners experience and expertise in the field and specialist study reports. In the Basic Assessment Report, the potential impacts are broadly identified and outlined. An assessment of the potential impacts is provided, identifying the impacts that are potentially significant and recommending management and mitigation measures to reduce the impacts.

In general, it is recognized that every development has the potential to pose various risks to the environment as well as to the residents or businesses in the surrounding area. Therefore, it is important that these possible risks are taken into account during the planning phase of the development. Risks and key issues were identified and addressed through an internal process based on similar developments, and an environmental evaluation.

In accordance with the requirements from the EIA Regulations 2014 GN 982, Regulation 19 (3) and as set out in Appendix 1, the following impacts of the issues identified through the basic assessment phase were assessed in terms of the following methodology. All impacts are assessed according to the following criteria.

- The **nature**, a description of what causes the effect, what will be affected, and how it will be affected.
  - The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate with
  - a score of 1 being site specific,
  - 2 = local (site + immediate surrounds),
  - 3 = regional (the impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns) ,
  - 4 = national and
  - a score of 5 being international (where the impact has international ramifications that extend beyond the boundaries of South Africa).

- The **duration**, wherein it is indicated whether:
  - The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - Medium-term (5–15 years) – assigned a score of 3;
  - Long term (> 15 years) - assigned a score of 4; or;
  - Permanent - assigned a score of 5.

- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - 0 is small and will have no effect on the environment;
  - 2 is minor and will not result in an impact on processes;
  - 4 is low and will cause a slight impact on processes;
  - 6 is moderate and will result in processes continuing but in a modified way;
  - 8 is high (processes are altered to the extent that they temporarily cease); and
  - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

- The **probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
  - Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
  - Assigned a score of 2 is improbable (some possibility, but low likelihood);
  - Assigned a score of 3 is probable (distinct possibility);
  - Assigned a score of 4 is highly probable (most likely); and
  - Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).

- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- The **status**, which is described as positive, negative or neutral.
- The degree to which the impact can be reversed.

- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:
S= (E+D+M) P; where

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance** weightings for each potential impact are as follows:

- < **30 points**: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- **30-60 points**: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- **>60 points**: High (i.e. Impact is significant, mitigation is critical to reduce impact or risk. Resulting impact could influence the decision depending on the possible mitigation. An impact which could influence the decision about whether or not to proceed with the project.).

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the **CONSTRUCTION PHASE** for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

2.1 Structural Design Rehabilitation Alternative 1: Only rehabilitate the embankment and spillway without the addition of an outlet pipe (Preferred and Proposed).

Table 4: Structural Design Rehabilitation Alternative 1: CONSTRUCTION PHASE IMPACTS

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td colspan="3">1. Impact on Watercourse (Changes in water flow)</td></tr>
<tr><td>Nature of the Impact: Changing the quantity and fluctuation properties of the watercourse by for example restricting water flow or increasing flood flows

Source of Impact: The sources of this impact are limited since no hydrological changes will occur. During the construction phase it is possible that the compaction of soil temporary removal of vegetation may affect local water flow

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Possible (2)</td></tr>
</table>
</td><td>▪ Other than approved and authorized rehabilitation efforts, no other development or maintenance infrastructure is allowed within the delineated wetland and riparian areas or their associated buffer zones.
▪ Construction in and around watercourses must be restricted to the dryer winter months.
▪ A temporary fence or demarcation must be erected around the works area to prevent access to sensitive environs. The works areas generally include the servitude, construction camps, areas where material is stored and the actual footprint of the infrastructure.
▪ Prevent pedestrian and vehicular access into the riparian areas and buffer areas
▪ The amount of vegetation removed should be limited to the least amount possible.</td><td>Impacts to the flow characteristics of this watercourse are likely to be permanent unless rehabilitated.</td></tr>
</table>

Duration	Medium-term (3)	Medium-term (3)
Extent	Regional (3)	Limited to the local area (2)
Magnitude	Moderate (6)	Low (4)
Significance	**36(Medium)**	**18 (Low)**
Status (positive or negative)	Negative	Negative

▪ Formalize access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas. ▪ Management of on-site water use and prevent storm water or contaminated water directly entering the watercourse ▪ Management of point discharges ▪ Planning of the construction site must include eventual rehabilitation / restoration of indigenous vegetative cover ▪ Alien plant eradication and follow-up control activities prior to construction, to prevent spread into disturbed soils, as well as follow-up control during construction ▪ Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the proposed infrastructure and take immediate corrective action where invasive species are observed to establish. ▪ Rehabilitation of damage/impacts that arise as a result of construction must be implemented immediately upon completion of construction. ▪ Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed.	

2. Sedimentation of the Watercourse

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented
Nature of the Impact: <u>Sedimentation and change in turbidity of the watercourse</u> • Earthwork activities when constructing	▪ Consider the various methods and equipment available and select whichever method(s) that will have the least impact on watercourses.	Moderate changes to the ecosystem

<table>
<tr>
<td>

- Clearing of surface vegetation will expose the soils, which in rainy events would wash through the pans, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonies eroded soils successfully and seeds from proximate alien invasive trees can spread easily into these eroded soil.
- Disturbance of soil surface
- Disturbance of slopes through creation of roads and tracks adjacent to the watercourse
- Erosion (e.g. gully formation, bank collapse)

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly probable (4)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Medium-term (3)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Limited to the local area (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>52 (Medium)</td><td>18 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>

</td>
<td>

- Ensure that crew camps are located outside of the wetland or its buffer zone and establish effective sediment control measures, for example hay bales down slope of stockpiles
- Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005).
- Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.
- Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon completion of construction.
- Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.
- Maintain buffer zones to trap sediments
- Monitoring should be done to ensure that sediment pollution is timeously dressed

</td>
<td></td>
</tr>
<tr><td colspan="3">3. Alteration of Water Quality within the Watercourse</td></tr>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr>
<td>Nature of the Impact: Alteration of water quality – due to foreign materials e.g discharge of solvents</td>
<td>

- Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer

</td>
<td>Moderate</td>
</tr>
</table>

<table>
<tr>
<td>and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the watercourse and a reduction in watercourse function.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Possible(2)</td></tr>
<tr><td>Duration</td><td>Medium-term (3)</td><td>Medium-term (3)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Local Area (2)</td></tr>
<tr><td>Magnitude</td><td>High (8)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>42 (moderate)</td><td>18 (low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td>
<td>zone.
▪ Implementation of appropriate storm water management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse.
▪ The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc.
▪ After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use.
▪ Maintenance of construction vehicles / equipment should not take place within the watercourse or watercourse buffer.
▪ Maintenance of buffer zones to trap sediments with associated toxins
▪ Ensure that no operational activities impact on the watercourse or buffer area. This includes edge effects.
▪ Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse
▪ Treatment of pollution identified should be prioritized accordingly.</td>
<td></td>
</tr>
<tr><td colspan="3">4. Impact on Vegetation</td></tr>
</table>

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr>
<td>

Nature of the Impact: The construction and rehabilitation activities will require the removal or vegetation from the dam wall and surrounds. In addition, vegetation within the moist grassland will be destroyed or degraded and activities could degrade or destroy the surrounding grassland that serve as catchment and buffer to the watercourse downstream of the dam. If these impacts are foreseen, it can be mitigated.

The sources of this impact could include:

- Clearing of and damage to vegetation in construction footprint, access roads, construction camps, vehicle / machinery traffic and trampling by workers;
- Removal of vegetation from the dam

Illegal disposal and dumping of construction material such as cement or oil, as well as maintenance materials during construction.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Definite (5)</td></tr>
<tr><td>Duration</td><td>Short term (2)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Site and surrounds (2)</td><td>Limited to Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>50 (Medium)</td><td>35 (medium)</td></tr>
<tr><td>Status</td><td>Negative</td><td>Negative</td></tr>
</table>

</td>
<td>

- The moist grasslands are sensitive, the work area (e.g. area to be disturbed) in the moist grassland must be kept to a minimum and therefore manual labour is recommended to keep the servitude as small as possible, with no heavy vehicles driving over or turning within the remnant rocky grasslands and moist grasslands.
- A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas where material is stored and the actual footprint of the development) to prevent access to sensitive environs.
- Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area (specific to the rocky grassland and moist grassland).
- No open fires are permitted.
- Formalize access roads and where possible, make use the existing road through the moist grassland, rather than creating new routes through naturally vegetated areas.
- A vegetation rehabilitation plan should be implemented during construction phase
- Moist grasslands could also be removed as sods, but should be watered while stored until such time that it could be used for rehabilitation.
- Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access until such time that monitoring confirms that rehabilitation was successful

</td>
<td>High.</td>
</tr>
</table>

(positive or negative)			(minimum of 2 years). ▪ Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority. ▪ No activities should take place during rainy events and at least 2 days afterwards. ▪ Maintain site demarcations in position until the cessation of construction work. ▪ After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.	

5. Establishment of Alien Invasive Plant Species

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented
Nature of the Impact: Introduction of additional alien invasive species and the increase in the existing level of invasion present on the study site			▪ Alien invasive species, in particular category 1 species that were identified within the study site should be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. ▪ All alien seedlings and saplings must be removed as they become evident for the duration of construction. ▪ Weed control, manual methods are preferred over chemical and biological control ▪ Monitor the establishment of alien invasive species	Excessive spread of alien plants
Description	**Without Mitigation**	**With Mitigation**		
Probability	Probable (3)	Probable (3)		
Duration	Medium-term (3)	Short duration (2)		
Extent	Regional (4)	Local (2)		
Magnitude	Low (4)	Low (4)		
Significance	**33 (Moderate)**	**24 (Low)**		
Status	Negative	Negative		

(positive or negative)			within the areas affected by the construction and take immediate corrective action where invasive species are observed to establish. ▪ Rehabilitate or vegetate disturbed areas	

6. Impact on Soil and Seed bank

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented
Nature of Impact: Soil compaction and subsequent impacts on the seed bank			▪ Vehicles and machinery may not veer from the dedicated roads. ▪ Once construction is complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion, while the natural species composition should be re-established. ▪ It is advised that environmental audits be undertaken by an independent party during this construction period, especially in sensitive areas.	Medium
Description	**Without Mitigation**	**With Mitigation**		
Probability	Probable (3)	Probable (3)		
Duration	Permanent (5)	Permanent (5)		
Extent	Site (1)	Site (1)		
Magnitude	High (8)	Minor (2)		
Significance	**42 (Medium)**	**24 (Low)**		
Status (positive or negative)	Negative	Negative		

7. Soil Erosion

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented
Nature of the Impact: Exposure of the soil to erosion and subsequent sedimentation of proximate moist grassland			▪ Do not allow erosion to develop on a large scale before taking action. ▪ Where possible, no construction / activities should be undertaken within the moist grasslands. The extent of wetland conditions should be verified by a wetland	
Description	**Without**	**With Mitigation**		

	Mitigation	
Probability	Highly Probable (4)	Probable (3)
Duration	Medium term (3)	Medium term (3)
Extent	Local (2)	Site (1)
Magnitude	High (8)	Minor (2)
Significance	**52 (Medium)**	**18 (Low)**
Status (positive or negative)	Negative	Negative

specialist and no activities should take place within these areas without that a Water Use License was granted by the Department of Water and Sanitation (DWS) for these activities.

- Make use of existing roads and tracks where feasible, rather than creating new routes through vegetated areas.
- Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area.
- Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed.
- Colonization of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study site.
- Protect all areas susceptible to erosion (especially the sloped rocky grassland) and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.

8. Impact on Fauna, Birds and Hepertofauna

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>Nature of the Impact: Loss of fauna, birds and Hepertofauna due to habitat infringement

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Short-term (2)</td><td>Short-term (2)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Limited to Local Area (2)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Minor (2)</td></tr>
<tr><td>Significance</td><td>24 (Low)</td><td>12 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>▪ Ensure that that vegetation is only removed in the work area/project authorized areas
▪ No fires should be allowed in natural veld – demarcated areas
▪ Demarcate the wetlands and riparian areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas.
▪ The Contractor shall ensure that domestic animals and native animals belonging to the local community are kept away from unprotected works.
▪ The Contractor shall ensure that the work site is kept clean and tidy and free from rubbish, which would attract animal pest species.
▪ Anthills that occur should not be disturbed unless it is unavoidable for construction purposes. Before construction starts, construction workers should be educated with regards to littering and poaching;
▪ Develop a procedure for dealing with amphibians /reptiles encountered at the site, including dangerous reptiles' e.g. snakes. Where necessary, call in professionals (such as SPCA) to remove the reptiles.</td><td>Low</td></tr>
<tr><td colspan="3">9. Visual Impact</td></tr>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>Nature of the Impact: Visual nuisance caused by inappropriate housekeeping and waste management on site</td><td>▪ Ensure that no litter, refuse, waste, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent or</td><td>The risk is medium</td></tr>
</table>

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Improbable (2)
Duration	Short-term (2)	Short-term (2)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	Medium (6)	Medium (6)
Significance	**30 (Medium)**	**20 (Low)**
Status (positive or negative)	Negative	Negative

surrounding properties including road verges, roads or public places and open spaces during or after the construction period. All waste/litter/rubbish etc. must be disposed of at an approved dumping site as approved by the Council.

- Supply sufficient garbage bins throughout the site and service regularly.
- Ensure good housekeeping is implemented at all times.
- Keep the property neat and litter free at all times and maintain the landscaped areas.
- Bare surfaces must be rehabilitated as soon as possible with indigenous vegetation that will be able to grow in the area;
- The landscape must be rehabilitated in such a way that it corresponds to the surrounding topography;
- Lighting on site is to be sufficient for safety and security purposes, but shall not be intrusive to neighboring residents, disturb wildlife, or interfere with road traffic;
- Should overtime/night work be authorized, the Contractor shall be responsible to ensure that lighting does not cause undue disturbance to neighboring residents. In this situation low flux and frequency lighting shall be utilized.

10. Noise Pollution

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented

<table>
<tr>
<td>Nature of the Impact: Construction noise to immediate surrounding neighborhood.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Short-term (2)</td><td>Short-term (2)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Limited to Local Area (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (5)</td></tr>
<tr><td>Significance</td><td>30 (Medium)</td><td>18 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td>
<td>▪ Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays only.
▪ If construction is required on the weekend; permission from adjacent landowners will be required prior to construction.
▪ No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site.
▪ Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers etc.) must be used as per operating instructions and maintained properly during site operations.</td>
<td>Medium</td>
</tr>
<tr><td colspan="3">11. Impact on Heritage Resources</td></tr>
<tr><td>Potential impacts:</td><td>Proposed mitigation:</td><td>Risk of the impact and mitigation not being implemented</td></tr>
<tr>
<td>Nature of the Impact: <u>Loss and disturbance of heritage sites due to the development.</u>

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Short-term (2)</td><td>Short-term (2)</td></tr>
</table>
</td>
<td>▪ Should graves, fossils or any archaeological artefacts be identified during construction, work on the area where the artefacts were found, must cease immediately and it should immediately be reported to a heritage practitioner or local museum so that an investigation and evaluation of the finds can be made.</td>
<td>N/A</td>
</tr>
</table>

Extent	Limited to Site (1)	Limited to Site (1)		
Magnitude	Low (4)	Minor (2)		
Significance	**24 (Low)**	**12 (Low)**		
Status (positive or negative)	Negative	Negative		
Impact on Paleontological Resources				
Impact is Insignificant			▪ The following should be conserved: if any paleontological material is exposed during digging, excavating, drilling or blasting, SAHRA must be notified. All development activities must be stopped and a palaeontologist should be called in to determine proper mitigation measures, especially for shallow caves. ▪ Condition in which development may proceed: It is further suggested that a Section 37(2) agreement of the Occupational, Health and Safety Act 85 of 1993 is signed with the relevant contractors to protect the environment (fossils) and adjacent areas as well as for safety and security reasons.	**Impact is Insignificant with or without mitigation**
12. Impact on Healthy and Safety and Security Risk				
Potential impacts:			**Proposed mitigation:**	**Risk of the impact and mitigation not being implemented**
Nature of the Impact: ▪ Influx of people looking for jobs to site ▪ Employees using the surrounding environment			▪ All flammable substances must be stored in dry area which do not pose an ignition risk to the said	Medium

for ablution
- Open fires
- Theft etc.
- Injuries due to construction hazards

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Improbable (2)
Duration	Short-term (1)	Short-term (1)
Extent	Local Area (2)	Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**36 (Medium)**	**12 (Low)**
Status (positive or negative)	Negative	Negative

substances
- Ensure all construction vehicles and machinery is under the control of competent personnel.
- No open fires will be allowed on site unless in a demarcated area identified by the ECO
- Limit access to the construction site to the workforce only. Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).
- Construction footprints, including site offices, excavations, storage areas, materials lay-down areas, stockpile area, and workers rest areas should be clearly demarcated or fenced off before construction commences.
- All construction activities should be limited to the demarcated areas.
- Access to these demarcated areas strictly controlled.
- Entry points and access routes to the sites must be clearly marked and traffic limited to those areas as far as possible.
- Suitable warning and information signage should be erected before construction commences.
- Adequate toilet facilities must be provided for all staff members as standard health and safety practice.
- The ablution facilities must be regularly serviced to reduce the risk of surface or groundwater pollution
- Packaging and other waste material may not be burned on site under any circumstances.
- The Contractor shall supply firefighting equipment in proportion to the fire risk presented by the type of

	construction and other on-site activities and materials used on site. This equipment shall be kept in good operating order. This particularly applies to welding activities. ▪ Smoking is only allowed in designated safe smoking areas. ▪ Emergency preparedness and response plan for the construction phase must be developed and implemented. ▪ All new laborers recruited from the community must undergo relevant training to reduce hazards that may arise from job responsibilities and improve on job skills. ▪ No accommodation will be allowed on site. The contractor and project site manager are responsible for making the necessary arrangements for transporting staff to and from site on a daily basis.	
13. Pollution caused by Inappropriate Management and Handling of Waste		
Potential impacts:	**Proposed mitigation:**	**Risk of the impact and mitigation not being implemented**
Nature of the Impact: ▪ Inappropriate management of construction rubble left onsite may attract vermin, encourage the growth of opportunistic alien vegetation and become unsightly ▪ Hazardous waste e.ge used oils, offcuts, empty	▪ Regular litter picking and general waste bins must be readily available for litter disposal and general housekeeping. ▪ All solid waste generated during the construction process must be placed in a designated waste collection area within the construction camp and	Medium

bitumen containers etc., could pollute surface and groundwater resources if not properly contained.

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Probable (3)
Duration	Short-term (2)	Very short-term (1)
Extent	Limited to Local Area (2)	Limited to Local Area (1)
Magnitude	Moderate (6)	Moderate (6)
Significance	**40 (Moderate)**	**24 (Low)**
Status (positive or negative)	Negative	Negative

must not be allowed to blow around the site, be accessible to animals, or be placed in piles adjacent the waste skips / bins. All solid waste must then be disposed of at the nearest licensed landfill and safe disposal certificates obtained. Separate waste skips/ bins for the different waste streams must be available on site.

- The waste containers must be appropriate to the waste type contained therein and where necessary should be lined and covered. This will be managed through the site specific EMPr and monitored by the ECO.
- No waste (hazardous or general) will be disposed of in the trenches around the construction footprint. All hazardous material must be carefully stored and then disposed of offsite at the licensed hazardous landfill site
- All excess material and rubble must be removed from the site so not to restrict the rehabilitation process.
- Adequate toilet facilities must be provided for all staff members as standard construction practice. Monitor the sewerage facilities for spillages, and handle any spillages as hazardous waste;
- Chemical toilets must be placed within the construction camp and not in close proximity to the river/wetlands. The chemical toilets to be provided must be from a registered company and all sewage must be disposed of at an appropriate facility. Safe disposal certificates must be kept on record.
- Machinery must be properly maintained to keep oil

<table>
<tr><td></td><td>leaks in check</td><td></td></tr>
<tr><td colspan="3">14. Soil, Surface and Groundwater Pollution</td></tr>
<tr><td>Potential impacts:</td><td>Proposed mitigation:</td><td>Risk of the impact and mitigation not being implemented</td></tr>
<tr><td>Nature of the Impact:
Mismanagement, handling and storage of hazardous chemicals and materials may result in spillages causing pollution to soil, surface and groundwater resources

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Short-term (2)</td><td>Very short-term (1)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Limited to Local Area (1)</td></tr>
<tr><td>Magnitude</td><td>High (8)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>48 (Medium)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>▪ Any hazardous or dangerous goods utilized during the construction phase must be stored on an impermeable surface that is bunded, fenced, locked and covered.
▪ A spill kits must be clearly marked and visible when utilizing hazardous or dangerous materials to ensure all spills can be immediately cleaned.
▪ Remediation of spillages must be conducted on a continual within 24h of spillage;
▪ Contaminated soil will be considered to be hazardous waste and disposed of accordingly
▪ Any hazardous or dangerous goods utilized during the construction phase must be stored on an impermeable surface that is bunded, fenced, locked and covered.
▪ A spill kits must be clearly marked and visible when utilizing hazardous or dangerous materials to ensure all spills can be immediately cleaned.
▪ Remediation of spillages must be conducted on a continual basis and within 24h of spillage;
▪ Contaminated soil will be considered to be hazardous waste and disposed of accordingly.
▪ The contractors must provide and maintain a method statement for mixing of cement and asphalt. The</td><td>Medium</td></tr>
</table>

	method statement must provide information on proposed location, storage, washing and disposal of cement, packaging, tools and plant storage. ▪ Washing and cleaning of equipment and vehicles should also be done within a bermed area (wash bay area). ▪ The mixing of concrete should only be done at specifically selected sites on mortar boards or similar structures to contain pollution ▪ Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bunded areas or under lock and key, as appropriate, in well-ventilated areas ▪ Drip trays (minimum of 10cm deep) must be placed under all vehicles suspected of leaking these must not be left unattended, drip trays must be utilized. ▪ Drip trays must be utilized during repairs and maintenance of all machinery. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle	
15. Social Economic Impact		
Potential impacts:	**Proposed mitigation:**	**Risk of the impact and mitigation not being implemented**
Nature of the Impact: ○ Temporary job creation and skills development during the construction phase.	▪ It is recommended that local employment policy is adopted to maximize the opportunities made	Medium

○ Economic multiplier effects from the use of local contractors and establishment of related businesses. **Description / Without Enhancement / With Enhancement** **Probability**: Probable (3) / Probable (3) **Duration**: Short-term (2) / Short-term (2) **Extent**: Limited to Local Area (2) / Limited to Local Area (2) **Magnitude**: Moderate (6) / High (8) **Significance**: **30 (Low)** / **36 (Medium)** **Status (positive or negative)**: Positive / Positive	available to the local labor force. ▪ Where reasonable and practical JRA should appoint local contractors and implement a (local first) policy especially for semi-skilled and low skilled job categories. ▪ Training and skills development programmers should be initiated prior to the commencement of the construction phase. ▪ The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. ▪ Where possible, efforts should be made to employ local employees that are compliant with Black Economic Empowerment (BEE) criteria.	
16. Impact on Air Quality		
Potential impacts:	**Proposed mitigation:**	**Risk of the impact and mitigation not being implemented**
Nature of Impact: Impact on Air Quality ○ Dust generated during vegetation clearing ○ Exhaust fumes from construction machinery and vehicles **Description / Without Mitigation / With Mitigation** **Probability**: Highly Probable (4) / Probable (3) **Duration**: Short-term (2) / Very short-term (1)	▪ Appropriate dust suppression measures should be implemented to control dust pollution during windy and dry conditions. ▪ Speed restriction of 40km/h must be implemented for all construction vehicles. ▪ All vehicles transporting friable materials such a sand, rubble etc. must be covered by a tarpaulin or wet down. ▪ No burning of refuse or vegetation is permitted on site.	Moderate

Extent	Limited to Local Area (2)	Limited to Local Area (1)		
Magnitude	Medium (6)	Low (4)		
Significance	**40 (medium)**	**18 (Low)**		
Status (positive or negative)	Negative	Negative		

IMPACTS THAT MAY RESULT FROM THE OPERATION PHASE
A summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the **Operation Phase** of the Activity Alternative 1: **Proposed & Preferred Activity**

2.2 Activity Rehabilitation Alternative 1: Only rehabilitate the embankment and spillway without the addition of an outlet pipe (Preferred and Proposed).

OPERATION PHASE IMPACTS

Table 5: The environmental impacts associated with the **OPERATION PHASE** are anticipated as follows.

<table>
<tr><th colspan="3">1. Impact on Vegetation</th></tr>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>Nature of the Impact: Loss of natural vegetation in sensitive areas

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Medium-term (2)</td><td>Medium term (3)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>24 (low)</td><td>18 (low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>▪ The moist grasslands are sensitive, the work area (e.g. area to be disturbed) in the moist grassland must be kept to a minimum and therefore manual labour is recommended to keep the servitude as small as possible, with no heavy vehicles driving over or turning within the remnant rocky grasslands and moist grasslands.
▪ A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas where material is stored and the actual footprint of the development) to prevent access to sensitive environs.
▪ Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area (specific to the rocky grassland and</td><td>Expected to be medium</td></tr>
</table>

	moist grassland). ▪ No open fires are permitted. ▪ Formalize access roads and where possible, make use the existing road through the moist grassland, rather than creating new routes through naturally vegetated areas. ▪ Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access until such time that monitoring confirms that rehabilitation was successful (minimum of 2 years). ▪ Maintenance workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority. ▪ No maintenance activities should take place during rainy events and at least 2 days afterwards. ▪ Maintain site demarcations in position until the cessation of construction work. ▪ After maintenance, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.	
2. Spread of Alien Invasive Plant Species		
Potential impacts:	**Proposed mitigation:**	**Risk of the impact and mitigation not being implemented**

<table>
<tr>
<td>Nature of the Impact: Introduction of additional alien invasive species and the increase in the existing level of invasion present on the study site

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Medium-term (2)</td><td>Medium term (3)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>24 (low)</td><td>18 (low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td>
<td>

Alien invasive species, in particular category 1 species that were identified within the study site should be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation.
Weed control, manual methods are preferred over chemical and biological control
All maintenance vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the area that requires maintenance during operation.
Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish.
Rehabilitate or vegetate disturbed areas

</td>
<td>Expected to be medium</td>
</tr>
<tr><td colspan="3">3. Impact on Soil</td></tr>
<tr><td>Potential impacts:</td><td>Proposed mitigation:</td><td>Risk of the impact and mitigation not being implemented</td></tr>
<tr>
<td>Nature of Impact: Soil compaction and subsequent impacts on the seed bank

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
</table>
</td>
<td>

Vehicles and machinery may not veer from the dedicated roads.
Once maintenance is complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion, while the natural species composition should be re-

</td>
<td>Expected to be medium</td>
</tr>
</table>

Duration	Permanent (5)	Permanent (5)	established.	
Extent	Site (1)	Site (1)		
Magnitude	Moderate (6)	Small (0)		
Significance	**36 (Medium)**	**12 (Low)**		
Status (positive or negative)	Negative	Negative		

4. Soil Erosion

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented
Nature of the Impact: Exposure of the soil to erosion and subsequent sedimentation of proximate moist grassland **Description** / **Without Mitigation** / **With Mitigation** **Probability**: Highly Probable (4) / Improbable (2) **Duration**: Medium term (3) / Medium term (3) **Extent**: Site (1) / Site (1) **Magnitude**: Low (4) / Minor (2) **Significance**: **32 (Medium)** / **14 (Low)** **Status (positive or negative)**: Negative / Negative	▪ Do not allow erosion to develop on a large scale before taking action. ▪ Make use of existing roads and tracks where feasible, rather than creating new routes through vegetated areas. ▪ Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area. ▪ Remove only the vegetation where essential for maintenance purposes and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed. ▪ Protect all areas susceptible to erosion (especially the sloped rocky grassland) and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.	Expected to be medium

<table>
<tr><th colspan="3">5. Changing the quantity and fluctuation properties of the watercourse.</th></tr>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>Nature of the Impact: Changing the quantity and fluctuation properties of the watercourse.

Source of Impact: The sources of this impacts include the compaction of soil, surface water redirection of water during operation activities

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (4)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>33 (Moderate)</td><td>16 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>▪ Maintenance activities should not take place within watercourses or buffer zones. Where unavoidable, the footprint needed for maintenance must be kept to a minimum. This is subjected to authorization by means of a water use license.
▪ Where possible, maintenance within watercourses must be restricted to the drier winter months.
▪ Maintenance activities should not impact on rehabilitated areas.
▪ Maintenance workers should respect and also maintain fences that are in place to prevent livestock from entering rehabilitated areas, until such time that monitoring found that rehabilitation is successful and the fences removed.
▪ Maintenance should not impact on natural vegetation.
▪ Maintenance vehicles must stay on dedicated roads/servitudes.</td><td>Expected to be low with or without mitigation</td></tr>
<tr><th colspan="3">6. Sedimentation of the Watercourse</th></tr>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>Nature of the Impact: Sedimentation of the Watercourse

<table>
<tr><th>Description</th><th>Without</th><th>With Mitigation</th></tr>
</table>
</td><td>▪ Rehabilitated vegetation should not be impacted on by maintenance.
▪ Maintenance vehicles must remain on dedicated roads and servitudes.</td><td>Expected to be low with or without mitigation</td></tr>
</table>

	Mitigation	
Probability	Probable (3)	Possible (2)
Duration	Long term (4)	Medium term (3)
Extent	Regional (3)	Local (2)
Magnitude	Low (4)	Low (4)
Significance	**33 (moderate)**	**18 (low)**
Status (positive or negative)	Negative	Negative

- Maintenance activities should not take place within watercourses or buffer zones. Where unavoidable, the footprint needed for maintenance must be kept to a minimum. This is subjected to authorization by means of a water use license.
- Where possible, maintenance within watercourses must be restricted to the drier winter months.
- Maintenance activities should not impact on rehabilitated areas and where soil or vegetation disturbances took place, this should be rehabilitated immediately.
- Runoff from the maintenance footprint must be managed to avoid erosion and pollution problems.
- Implementation of best management practices such as the bio retention facility will minimize impacts

7. **Impact on Water Quality**

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented
Nature of the Impact: Alteration of water quality – increasing the amounts of nutrients (phosphate, nitrite, nitrate,).	▪ Provision of adequate sanitation facilities located outside of the wetland/riparian area or its associated buffer zone.	Expected to be low with or without mitigation

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Possible (2)
Duration	Short-term (2)	Short-term (2)
Extent	Local (2)	Local (2)
Magnitude	Low (4)	Low (4)
Significance	**24 (Low)**	**16 (Low)**

Status (positive or negative)	Negative	Negative		

8. **Impact on a Watercourse**

Potential impacts:			**Proposed mitigation:**	**Risk of the impact and mitigation not being implemented**
Nature of the Impact: Changing the physical structure within a water resource (habitat).			▪ Maintenance activities should not take place within watercourses or buffer zones. Where unavoidable, the footprint for maintenance must be kept to a minimum. This is subjected to authorization by means of a water use license. ▪ Where possible, maintenance within watercourses must be restricted to the drier winter months. ▪ Maintenance activities should not impact on rehabilitated or naturally vegetated areas.	Expected to be medium.
Description	**Without Mitigation**	**With Mitigation**		
Probability	Probable (3)	Possible (2)		
Duration	Long term (4)	Short term (2)		
Extent	Regional (3)	Local (2)		
Magnitude	Moderate (4)	Low (4)		
Significance	**33 (Moderate)**	**16 (Low)**		
Status (positive or negative)	Negative	Negative		

The Present Ecological Situation and Ecological Condition of the various subsections of the site will be improved by the rehabilitation exercise. None of the vertebrates will be displaced or disadvantaged by the rehabilitation. The latter will in fact boost the persistence and increase of the vertebrate species richness in an otherwise densely built-up residential area

9. **Risk of Vandalism on Rehabilitated Dam and Its Associated Infrastructure**

Only rehabilitate the embankment and spillway without the addition of an outlet pipe

An outlet pipe is of high risk to vandalism, in this Option1, the outlet pipe has been eliminated to avoid the vandals. Hence, none is will be expected should this Option be implemented.

2.2 REHABILITATE THE EMBANKMENT AND SPILLWAY WITH THE ADDITION OF AN OUTLET PIPE THAT IS PLACED OVER THE EMBANKMENT TO FORM A SIPHON: ALTERNATIVE 2

Table 6: Structure Design Alternative 2-: CONSTRUCTION IMPACTS

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td colspan="3">17. Impact on Watercourse (Changes in water flow)</td></tr>
<tr><td>Nature of the Impact: Changing the quantity and fluctuation properties of the watercourse by for example restricting water flow or increasing flood flows

Source of Impact: The sources of this impact are limited since no hydrological changes will occur. During the construction phase it is possible that the compaction of soil temporary removal of vegetation may affect local water flow

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Medium-term (3)</td><td>Medium-term (3)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Limited to the</td></tr>
</table>
</td><td>▪ Other than approved and authorized rehabilitation efforts, no other development or maintenance infrastructure is allowed within the delineated wetland and riparian areas or their associated buffer zones.
▪ Construction in and around watercourses must be restricted to the dryer winter months.
▪ A temporary fence or demarcation must be erected around the works area to prevent access to sensitive environs. The works areas generally include the servitude, construction camps, areas where material is stored and the actual footprint of the infrastructure.
▪ Prevent pedestrian and vehicular access into the riparian areas and buffer areas
▪ The amount of vegetation removed should be limited to the least amount possible.
▪ Formalize access roads and make use of existing roads and tracks where feasible, rather than creating new routes</td><td>Impacts to the flow characteristics of this watercourse are likely to be permanent unless rehabilitated.</td></tr>
</table>

		local area (2)
Magnitude	Moderate (6)	Low (4)
Significance	**36(Medium)**	**18 (Low)**
Status (positive or negative)	Negative	Negative

through naturally vegetated areas.

- Management of on-site water use and prevent storm water or contaminated water directly entering the watercourse
- Management of point discharges
- Planning of the construction site must include eventual rehabilitation / restoration of indigenous vegetative cover
- Alien plant eradication and follow-up control activities prior to construction, to prevent spread into disturbed soils, as well as follow-up control during construction
- Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the proposed infrastructure and take immediate corrective action where invasive species are observed to establish.
- Rehabilitation of damage/impacts that arise as a result of construction must be implemented immediately upon completion of construction.
- Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed.

18. Sedimentation of the Watercourse

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented
Nature of the Impact: <u>Sedimentation and change in turbidity of the watercourse</u> • Earthwork activities when constructing • Clearing of surface vegetation will expose the soils, which in rainy events would wash through	▪ Consider the various methods and equipment available and select whichever method(s) that will have the least impact on watercourses. ▪ Ensure that crew camps are located outside of the wetland or its buffer zone and establish effective	Moderate changes to the ecosystem

the pans, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonies eroded soils successfully and seeds from proximate alien invasive trees can spread easily into these eroded soil.

- Disturbance of soil surface
- Disturbance of slopes through creation of roads and tracks adjacent to the watercourse
- Erosion (e.g. gully formation, bank collapse)

Description	Without Mitigation	With Mitigation
Probability	Highly probable (4)	Possible (2)
Duration	Long term (4)	Medium-term (3)
Extent	Regional (3)	Limited to the local area (2)
Magnitude	Moderate (6)	Low (4)
Significance	**52 (Medium)**	18 (Low)
Status (positive or negative)	Negative	Negative

sediment control measures, for example hay bales down slope of stockpiles

- Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005).
- Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.
- Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon completion of construction.
- Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.
- Maintain buffer zones to trap sediments
- Monitoring should be done to ensure that sediment pollution is timeously dressed

19. Alteration of Water Quality within the Watercourse

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented
Nature of the Impact: Alteration of water quality – due to foreign materials e.g discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in	▪ Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone. ▪ Implementation of appropriate storm water	Moderate

<table>
<tr>
<td>the loss of sensitive biota in the watercourse and a reduction in watercourse function.

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Possible(2)</td></tr>
<tr><td>Duration</td><td>Medium-term (3)</td><td>Medium-term (3)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Local Area (2)</td></tr>
<tr><td>Magnitude</td><td>High (8)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>42 (moderate)</td><td>18 (low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td>
<td>management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse.
▪ The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc.
▪ After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use.
▪ Maintenance of construction vehicles / equipment should not take place within the watercourse or watercourse buffer.
▪ Maintenance of buffer zones to trap sediments with associated toxins
▪ Ensure that no operational activities impact on the watercourse or buffer area. This includes edge effects.
▪ Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse
▪ Treatment of pollution identified should be prioritized accordingly.</td>
<td></td>
</tr>
<tr><td colspan="3">20. Impact on Vegetation</td></tr>
<tr><td>Potential impacts:</td><td>Proposed mitigation:</td><td>Risk of the impact and mitigation not being implemented</td></tr>
<tr><td></td><td>▪ The moist grasslands are sensitive, the work area (e.g.</td><td>High.</td></tr>
</table>

Nature of the Impact: The construction and rehabilitation activities will require the removal or vegetation from the dam wall and surrounds. In addition, vegetation within the moist grassland will be destroyed or degraded and activities could degrade or destroy the surrounding grassland that serve as catchment and buffer to the watercourse downstream of the dam. If these impacts are foreseen, it can be mitigated.

The sources of this impact could include:

- Clearing of and damage to vegetation in construction footprint, access roads, construction camps, vehicle / machinery traffic and trampling by workers;
- Removal of vegetation from the dam

Illegal disposal and dumping of construction material such as cement or oil, as well as maintenance materials during construction.

Description	Without Mitigation	With Mitigation
Probability	Definite (5)	Definite (5)
Duration	Short term (2)	Short term (2)
Extent	Site and surrounds (2)	Limited to Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**50 (medium)**	**35 (medium)**
Status (positive or negative)	Negative	Negative

area to be disturbed) in the moist grassland must be kept to a minimum and therefore manual labour is recommended to keep the servitude as small as possible, with no heavy vehicles driving over or turning within the remnant rocky grasslands and moist grasslands.

- A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas where material is stored and the actual footprint of the development) to prevent access to sensitive environs.
- Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area (specific to the rocky grassland and moist grassland).
- No open fires are permitted.
- Formalize access roads and where possible, make use the existing road through the moist grassland, rather than creating new routes through naturally vegetated areas.
- A vegetation rehabilitation plan should be implemented during construction phase
- Moist grasslands could also be removed as sods, but should be watered while stored until such time that it could be used for rehabilitation.
- Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access until such time that monitoring confirms that rehabilitation was successful (minimum of 2 years).
- Construction workers may not remove flora and neither may anyone collect seed from the plants without

<table>
<tr><td></td><td>permission from the local authority.
▪ No activities should take place during rainy events and at least 2 days afterwards.
▪ Maintain site demarcations in position until the cessation of construction work.
▪ After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.</td><td></td></tr>
<tr><td colspan="3">21. Establishment of Alien Invasive Plant Species</td></tr>
<tr><td>Potential impacts:</td><td>Proposed mitigation:</td><td>Risk of the impact and mitigation not being implemented</td></tr>
<tr><td>Nature of the Impact: Introduction of additional alien invasive species and the increase in the existing level of invasion present on the study site

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium-term (3)</td><td>Short duration (2)</td></tr>
<tr><td>Extent</td><td>Regional (4)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>33 (Moderate)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>▪ Alien invasive species, in particular category 1 species that were identified within the study site should be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation.
▪ All alien seedlings and saplings must be removed as they become evident for the duration of construction.
▪ Weed control, manual methods are preferred over chemical and biological control
▪ Monitor the establishment of alien invasive species within the areas affected by the construction and take immediate corrective action where invasive species are observed to establish.</td><td>Excessive spread of alien plants</td></tr>
</table>

<table>
<tr><td></td><td>▪ Rehabilitate or vegetate disturbed areas</td><td></td></tr>
<tr><td colspan="3">22. Impact on Soil and Seed bank</td></tr>
<tr><td>Potential impacts:</td><td>Proposed mitigation:</td><td>Risk of the impact and mitigation not being implemented</td></tr>
<tr><td>Nature of Impact: Soil compaction and subsequent impacts on the seed bank

<table><tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr><tr><td>Probability</td><td>Probable (3)</td><td>Probable (3)</td></tr><tr><td>Duration</td><td>Permanent (5)</td><td>Permanent (5)</td></tr><tr><td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr><tr><td>Magnitude</td><td>High (8)</td><td>Minor (2)</td></tr><tr><td>Significance</td><td>42 (Medium)</td><td>24 (Low)</td></tr><tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr></table></td><td>▪ Vehicles and machinery may not veer from the dedicated roads.
▪ Once construction is complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion, while the natural species composition should be re-established.
▪ It is advised that environmental audits be undertaken by an independent party during this construction period, especially in sensitive areas.</td><td>Medium</td></tr>
<tr><td colspan="3">23. Soil Erosion</td></tr>
<tr><td>Potential impacts:</td><td>Proposed mitigation:</td><td>Risk of the impact and mitigation not being implemented</td></tr>
<tr><td>Nature of the Impact: Exposure of the soil to erosion and subsequent sedimentation of proximate moist grassland

<table><tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr><tr><td>Probability</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr></table></td><td>▪ Do not allow erosion to develop on a large scale before taking action.
▪ Where possible, no construction / activities should be undertaken within the moist grasslands. The extent of wetland conditions should be verified by a wetland specialist and no activities should take place within these areas without that a Water Use License was granted by the Department of Water and Sanitation</td><td></td></tr>
</table>

Duration	Medium term (3)	Medium term (3)
Extent	Local (2)	Site (1)
Magnitude	High (8)	Minor (2)
Significance	**52 (Medium)**	**18 (Low)**
Status (positive or negative)	Negative	Negative

(DWS) for these activities.

- Make use of existing roads and tracks where feasible, rather than creating new routes through vegetated areas.
- Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area.
- Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed.
- Colonization of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study site.
- Protect all areas susceptible to erosion (especially the sloped rocky grassland) and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.

24. Impact on Fauna, Birds and Hepertofauna

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented
Nature of the Impact: Loss of fauna, birds and Hepertofauna due to habitat infringement	▪ Ensure that that vegetation is only removed in the	Low

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Improbable (2)
Duration	Short-term (2)	Short-term (2)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	Low (4)	Minor (2)
Significance	**24 (Low)**	**12 (Low)**
Status (positive or negative)	Negative	Negative

work area/project authorized areas
- No fires should be allowed in natural veld – demarcated areas
- Demarcate the wetlands and riparian areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas.
- The Contractor shall ensure that domestic animals and native animals belonging to the local community are kept away from unprotected works.
- The Contractor shall ensure that the work site is kept clean and tidy and free from rubbish, which would attract animal pest species.
- Anthills that occur should not be disturbed unless it is unavoidable for construction purposes. Before construction starts, construction workers should be educated with regards to littering and poaching;
- Develop a procedure for dealing with amphibians /reptiles encountered at the site, including dangerous reptiles' e.g. snakes. Where necessary, call in professionals (such as SPCA) to remove the reptiles.

25. Visual Impact

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented
Nature of the Impact: Visual nuisance caused by inappropriate housekeeping and waste management on site	▪ Ensure that no litter, refuse, waste, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent or surrounding properties including road verges, roads or public places and open spaces during or after the construction period. All waste/litter/rubbish etc.	The risk is medium

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Improbable (2)

Duration	Short-term (2)	Short-term (2)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	Medium (6)	Medium (6)
Significance	**30 (Medium)**	**20 (Low)**
Status (positive or negative)	Negative	Negative

must be disposed of at an approved dumping site as approved by the Council.

- Supply sufficient garbage bins throughout the site and service regularly.
- Ensure good housekeeping is implemented at all times.
- Keep the property neat and litter free at all times and maintain the landscaped areas.
- Bare surfaces must be rehabilitated as soon as possible with indigenous vegetation that will be able to grow in the area;
- The landscape must be rehabilitated in such a way that it corresponds to the surrounding topography;
- Lighting on site is to be sufficient for safety and security purposes, but shall not be intrusive to neighboring residents, disturb wildlife, or interfere with road traffic;
- Should overtime/night work be authorized, the Contractor shall be responsible to ensure that lighting does not cause undue disturbance to neighboring residents. In this situation low flux and frequency lighting shall be utilized.

26. Noise Pollution

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented
Nature of the Impact: Construction noise to immediate surrounding neighborhood.	▪ Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays only.	Medium

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Improbable (2)
Duration	Short-term (2)	Short-term (2)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	Moderate (6)	Moderate (5)
Significance	**30 (Medium)**	**18 (Low)**
Status (positive or negative)	Negative	Negative

- If construction is required on the weekend; permission from adjacent landowners will be required prior to construction.
- No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site.
- Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers etc.) must be used as per operating instructions and maintained properly during site operations.

27. Impact on Heritage Resources

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented
Nature of the Impact: Loss and disturbance of heritage sites due to the development.	▪ Should graves, fossils or any archaeological artefacts be identified during construction, work on the area where the artefacts were found, must cease immediately and it should immediately be reported to a heritage practitioner or local museum so that an investigation and evaluation of the finds can be made.	N/A

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Improbable (2)
Duration	Short-term (2)	Short-term (2)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Low (4)	Minor (2)

Significance	**24 (Low)**	**12 (Low)**		
Status (positive or negative)	Negative	Negative		
Impact on Paleontological Resources				
Impact is Insignificant			▪ The following should be conserved: if any paleontological material is exposed during digging, excavating, drilling or blasting, SAHRA must be notified. All development activities must be stopped and a palaeontologist should be called in to determine proper mitigation measures, especially for shallow caves. ▪ Condition in which development may proceed: It is further suggested that a Section 37(2) agreement of the Occupational, Health and Safety Act 85 of 1993 is signed with the relevant contractors to protect the environment (fossils) and adjacent areas as well as for safety and security reasons.	**Impact is Insignificant with or without mitigation**
28. Impact on Healthy and Safety and Security Risk				
Potential impacts:			**Proposed mitigation:**	**Risk of the impact and mitigation not being implemented**
Nature of the Impact: ▪ Influx of people looking for jobs to site ▪ Employees using the surrounding environment for ablution ▪ Open fires ▪ Theft etc.			▪ All flammable substances must be stored in dry area which do not pose an ignition risk to the said substances ▪ Ensure all construction vehicles and machinery is under the control of competent personnel. ▪ No open fires will be allowed on site unless in a	Medium

- Injuries due to construction hazards

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Improbable (2)
Duration	Short-term (1)	Short-term (1)
Extent	Local Area (2)	Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**36 (Medium)**	**12 (Low)**
Status (positive or negative)	Negative	Negative

demarcated area identified by the ECO

- Limit access to the construction site to the workforce only. Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).
- Construction footprints, including site offices, excavations, storage areas, materials lay-down areas, stockpile area, and workers rest areas should be clearly demarcated or fenced off before construction commences.
- All construction activities should be limited to the demarcated areas.
- Access to these demarcated areas strictly controlled.
- Entry points and access routes to the sites must be clearly marked and traffic limited to those areas as far as possible.
- Suitable warning and information signage should be erected before construction commences.
- Adequate toilet facilities must be provided for all staff members as standard health and safety practice.
- The ablution facilities must be regularly serviced to reduce the risk of surface or groundwater pollution
- Packaging and other waste material may not be burned on site under any circumstances.
- The Contractor shall supply firefighting equipment in proportion to the fire risk presented by the type of construction and other on-site activities and materials used on site. This equipment shall be kept in good operating order. This particularly applies to welding activities.

	▪ Smoking is only allowed in designated safe smoking areas. ▪ Emergency preparedness and response plan for the construction phase must be developed and implemented. ▪ All new laborers recruited from the community must undergo relevant training to reduce hazards that may arise from job responsibilities and improve on job skills. ▪ No accommodation will be allowed on site. The contractor and project site manager are responsible for making the necessary arrangements for transporting staff to and from site on a daily basis.	
29. Pollution caused by Inappropriate Management and Handling of Waste		
Potential impacts:	**Proposed mitigation:**	**Risk of the impact and mitigation not being implemented**
Nature of the Impact: ▪ Inappropriate management of construction rubble left onsite may attract vermin, encourage the growth of opportunistic alien vegetation and become unsightly ▪ Hazardous waste e.ge used oils, offcuts, empty bitumen containers etc., could pollute surface and groundwater resources if not properly contained.	▪ Regular litter picking and general waste bins must be readily available for litter disposal and general housekeeping. ▪ All solid waste generated during the construction process must be placed in a designated waste collection area within the construction camp and must not be allowed to blow around the site, be accessible to animals, or be placed in piles adjacent the waste skips / bins. All solid waste must then be disposed of at the nearest licensed landfill and safe	Medium

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Probable (3)
Duration	Short-term (2)	Very short-term (1)
Extent	Limited to Local Area (2)	Limited to Local Area (1)
Magnitude	Moderate (6)	Moderate (6)
Significance	**40 (Moderate)**	**24 (Low)**
Status (positive or negative)	Negative	Negative

disposal certificates obtained. Separate waste skips/ bins for the different waste streams must be available on site.

- The waste containers must be appropriate to the waste type contained therein and where necessary should be lined and covered. This will be managed through the site specific EMPr and monitored by the ECO.
- No waste (hazardous or general) will be disposed of in the trenches around the construction footprint. All hazardous material must be carefully stored and then disposed of offsite at the licensed hazardous landfill site
- All excess material and rubble must be removed from the site so not to restrict the rehabilitation process.
- Adequate toilet facilities must be provided for all staff members as standard construction practice. Monitor the sewerage facilities for spillages, and handle any spillages as hazardous waste;
- Chemical toilets must be placed within the construction camp and not in close proximity to the river/wetlands. The chemical toilets to be provided must be from a registered company and all sewage must be disposed of at an appropriate facility. Safe disposal certificates must be kept on record.
- Machinery must be properly maintained to keep oil leaks in check

30. Soil, Surface and Groundwater Pollution

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr>
<td>Nature of the Impact:
Mismanagement, handling and storage of hazardous chemicals and materials may result in spillages causing pollution to soil, surface and groundwater resources

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Short-term (2)</td><td>Very short-term (1)</td></tr>
<tr><td>Extent</td><td>Limited to Local Area (2)</td><td>Limited to Local Area (1)</td></tr>
<tr><td>Magnitude</td><td>High (8)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>48 (Medium)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td>
<td>

Any hazardous or dangerous goods utilized during the construction phase must be stored on an impermeable surface that is bunded, fenced, locked and covered.
A spill kits must be clearly marked and visible when utilizing hazardous or dangerous materials to ensure all spills can be immediately cleaned.
Remediation of spillages must be conducted on a continual within 24h of spillage;
Contaminated soil will be considered to be hazardous waste and disposed of accordingly
Any hazardous or dangerous goods utilized during the construction phase must be stored on an impermeable surface that is bunded, fenced, locked and covered.
A spill kits must be clearly marked and visible when utilizing hazardous or dangerous materials to ensure all spills can be immediately cleaned.
Remediation of spillages must be conducted on a continual basis and within 24h of spillage;
Contaminated soil will be considered to be hazardous waste and disposed of accordingly.
The contractors must provide and maintain a method statement for mixing of cement and asphalt. The method statement must provide information on proposed location, storage, washing and disposal of cement, packaging, tools and plant storage.
Washing and cleaning of equipment and vehicles

</td>
<td>Medium</td>
</tr>
</table>

	should also be done within a bermed area (wash bay area). ▪ The mixing of concrete should only be done at specifically selected sites on mortar boards or similar structures to contain pollution ▪ Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bunded areas or under lock and key, as appropriate, in well-ventilated areas ▪ Drip trays (minimum of 10cm deep) must be placed under all vehicles suspected of leaking these must not be left unattended, drip trays must be utilized. ▪ Drip trays must be utilized during repairs and maintenance of all machinery. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle	
31. Social Economic Impact		
Potential impacts:	**Proposed mitigation:**	**Risk of the impact and mitigation not being implemented**
Nature of the Impact: o Temporary job creation and skills development during the construction phase. o Economic multiplier effects from the use of local contractors and establishment of related businesses.	▪ It is recommended that local employment policy is adopted to maximize the opportunities made available to the local labor force. ▪ Where reasonable and practical JRA should appoint local contractors and implement a (local first) policy especially for semi-skilled and low skilled job	Medium

Description	Without Enhancement	With Enhancement
Probability	Probable (3)	Probable (3)
Duration	Short-term (2)	Short-term (2)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	Moderate (6)	High (8)
Significance	**30 (Low)**	**36 (Medium)**
Status (positive or negative)	Positive	Positive

categories.

- Training and skills development programmers should be initiated prior to the commencement of the construction phase.
- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.
- Where possible, efforts should be made to employ local employees that are compliant with Black Economic Empowerment (BEE) criteria.

32. Impact on Air Quality

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented

Nature of Impact: Impact on Air Quality

- Dust generated during vegetation clearing
- Exhaust fumes from construction machinery and vehicles

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Probable (3)
Duration	Short-term (2)	Very short-term (1)
Extent	Limited to Local Area (2)	Limited to Local Area (1)
Magnitude	Medium (6)	Low (4)
Significance	**40 (medium)**	**18 (Low)**

- Appropriate dust suppression measures should be implemented to control dust pollution during windy and dry conditions.
- Speed restriction of 40km/h must be implemented for all construction vehicles.
- All vehicles transporting friable materials such a sand, rubble etc. must be covered by a tarpaulin or wet down.
- No burning of refuse or vegetation is permitted on site.

Moderate

Status (positive or negative)	Negative	Negative		

IMPACTS THAT MAY RESULT FROM THE OPERATION PHASE
A summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the **Operation Phase** of the Implementing the Development: **Via Activity Alternative 2 Remedial Measures:**

2.2 REHABILITATE THE EMBANKMENT AND SPILLWAY WITH THE ADDITION OF AN OUTLET PIPE THAT IS PLACED OVER THE EMBANKMENT TO FORM A SIPHON: ALTERNATIVE 2:

Operation Impacts

Table 7: The environmental impacts associated with the **Operation phase** of the Remedial Works via (**Rehabilitation Activity Alternative 2**) are anticipated as follows.

<table>
<tr><th colspan="3">1. Impact on Vegetation</th></tr>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>Nature of the Impact: Loss of natural vegetation in sensitive areas

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Short term (1)</td><td>Short term (1)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Regional (3)</td></tr>
</table>
</td><td>▪ The moist grasslands are sensitive, the work area (e.g. area to be disturbed) in the moist grassland must be kept to a minimum and therefore manual labour is recommended to keep the servitude as small as possible, with no heavy vehicles driving over or turning within the remnant rocky grasslands and moist grasslands.
▪ A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas where material is stored and the actual footprint of the development) to</td><td>Expected to be medium</td></tr>
</table>

Magnitude	Moderate (6)	Minor (2)
Significance	**40 (Medium)**	**12 (Low)**
Status (positive or negative)	Negative	Negative

prevent access to sensitive environs.

- Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area (specific to the rocky grassland and moist grassland).
- No open fires are permitted.
- Formalize access roads and where possible, make use the existing road through the moist grassland, rather than creating new routes through naturally vegetated areas.
- Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access until such time that monitoring confirms that rehabilitation was successful (minimum of 2 years).
- Maintenance workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority.
- No maintenance activities should take place during rainy events and at least 2 days afterwards.
- Maintain site demarcations in position until the cessation of construction work.
- After maintenance, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.

2. Impact on threatened Plant

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>Nature of the Impact: Loss of threatened plants or plants of conservation concern
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Permanent (5)</td><td>Medium term (3)</td></tr>
<tr><td>Extent</td><td>National (4)</td><td>National (4)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Minor (2)</td></tr>
<tr><td>Significance</td><td>60 (Medium)</td><td>18 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>▪ Ensure that a walk through, to identify red or orange listed species, is conducted prior to the initiation of any rehabilitation efforts.
▪ Ensure that the appropriate plant rescue techniques are used if the permit to remove them is granted.</td><td>Expected to be medium</td></tr>
<tr><td colspan="3">3. Spread of Alien Invasive Plant Species</td></tr>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Nature of the Impact: Introduction of additional alien invasive species and the increase in the existing level of invasion present on the study site
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Medium term (3)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
</table></td><td>▪ Alien invasive species, in particular category 1 species that were identified within the study site should be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation.
▪ Weed control, manual methods are preferred over chemical and biological control</td><td>Expected to be medium</td></tr>
</table>

Magnitude	Low (4)	Low (4)
Significance	**36 (Medium)**	**14 (Low)**
Status (positive or negative)	Negative	Negative

- All maintenance vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the area that requires maintenance during operation.
- Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish.
- Rehabilitate or vegetate disturbed areas

4. Impact on Soil

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented
Nature of Impact: Soil compaction and subsequent impacts on the seed bank	▪ Vehicles and machinery may not veer from the dedicated roads. ▪ Once maintenance is complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion, while the natural species composition should be re-established.	Expected to be medium

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Improbable (2)
Duration	Permanent (5)	Permanent (5)
Extent	Site (1)	Site (1)
Magnitude	Moderate (6)	Small (0)
Significance	**36 (Medium)**	**12 (Low)**
Status (positive or negative)	Negative	Negative

5. Soil Erosion

<table>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>Nature of the Impact: Exposure of the soil to erosion and subsequent sedimentation of proximate moist grassland

<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Medium term (3)</td></tr>
<tr><td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Minor (2)</td></tr>
<tr><td>Significance</td><td>32 (Medium)</td><td>14 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>▪ Do not allow erosion to develop on a large scale before taking action.
▪ Make use of existing roads and tracks where feasible, rather than creating new routes through vegetated areas.
▪ Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area.
▪ Remove only the vegetation where essential for maintenance purposes and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed.
▪ Protect all areas susceptible to erosion (especially the sloped rocky grassland) and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.</td><td>Expected to be medium</td></tr>
<tr><td colspan="3">6. Changing the quantity and fluctuation properties of the watercourse.</td></tr>
<tr><th>Potential impacts:</th><th>Proposed mitigation:</th><th>Risk of the impact and mitigation not being implemented</th></tr>
<tr><td>Nature of the Impact: Changing the quantity and fluctuation properties of the watercourse.

Source of Impact: The sources of this impacts include the compaction of soil, surface water redirection of water during operation activities</td><td>▪ Maintenance activities should not take place within watercourses or buffer zones. Where unavoidable, the footprint needed for maintenance must be kept to a minimum. This is subjected to authorization by means of a water use license.
▪ Where possible, maintenance within watercourses</td><td>Expected to be low with or without mitigation</td></tr>
</table>

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Probable (3)
Duration	short-term (2)	short-term (2)
Extent	Limited to Local Area (2)	Limited to Local Area (1)
Magnitude	Moderate (6)	Moderate (6)
Significance	**30 (Low)**	**27 (Low)**
Status (positive or negative)	Negative	Negative

must be restricted to the drier winter months.
- Maintenance activities should not impact on rehabilitated areas.
- Maintenance workers should respect and also maintain fences that are in place to prevent livestock from entering rehabilitated areas, until such time that monitoring found that rehabilitation is successful and the fences removed.
- Maintenance should not impact on natural vegetation.
- Maintenance vehicles must stay on dedicated roads/servitudes.

7. **Sedimentation of the Watercourse**

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented

Nature of the Impact: Sedimentation of the Watercourse

Description	Without Mitigation	With Mitigation
Probability	Improbable (2)	Very Improbable (1)
Duration	Long term (4)	Long term (4)
Extent	Limited to Local Area (1)	Limited to Site (1)
Magnitude	Minor (2)	Small (0)
Significance	**14 (Low)**	**5 (Low)**
Status (positive or	Negative	Negative

- Rehabilitated vegetation should not be impacted on by maintenance.
- Maintenance vehicles must remain on dedicated roads and servitudes.
- Maintenance activities should not take place within watercourses or buffer zones. Where unavoidable, the footprint needed for maintenance must be kept to a minimum. This is subjected to authorization by means of a water use license.
- Where possible, maintenance within watercourses must be restricted to the drier winter months.
- Maintenance activities should not impact on rehabilitated areas and where soil or vegetation

Expected to be low with or without mitigation

<table>
<tr><td>

negative)		

</td><td>disturbances took place, this should be rehabilitated immediately.
▪ Runoff from the maintenance footprint must be managed to avoid erosion and pollution problems.
▪ Implementation of best management practices such as the bio retention facility will minimize impacts</td><td></td></tr>
<tr><td colspan="3">8. Impact on Water Quality</td></tr>
<tr><td>Potential impacts:</td><td>Proposed mitigation:</td><td>Risk of the impact and mitigation not being implemented</td></tr>
<tr><td>Nature of the Impact: Alteration of water quality – increasing the amounts of nutrients (phosphate, nitrite, nitrate,).

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Very improbable (1)
Duration	Medium term (3)	Short-term (2)
Extent	Limited to Local Area (2)	Limited to Site (1)
Magnitude	Low (4)	Low (4)
Significance	**27 (Low)**	**6 (Low)**
Status (positive or negative)	Negative	Negative

</td><td>▪ Provision of adequate sanitation facilities located outside of the wetland/riparian area or its associated buffer zone.</td><td>Expected to be low with or without mitigation</td></tr>
<tr><td>Nature of Impact: Alteration of water quality – toxic contaminants (including toxic metal ions (e.g. Copper, lead, zinc) and hydrocarbons.

Description	Without	With Mitigation

</td><td>▪ Ensure that maintenance work does not take place haphazardly, but according to a fixed plan, from one area to the other.
▪ After maintenance, the land must be cleared of rubbish, surplus materials, and equipment, and all</td><td>Expected to be low with or without mitigation</td></tr>
</table>

	Mitigation	
Probability	improbable (2)	Very improbable (1)
Duration	Medium term (3)	Short-term (2)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	Moderate (6)	Low (4)
Significance	**22 (Low)**	**8 (Low)**
Status (positive or negative)	Negative	Negative

parts of the land shall be left in a condition as close as possible to that prior to use.
- Ensure maintenance vehicles are in proper order and well maintained.
- Control of waste discharges.
- Guidelines for implementing clean technologies.
- Maintenance of buffer zones to trap sediments with associated toxins.

9. Impact on a Watercourse

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented

Nature of the Impact: Changing the physical structure within a water resource (habitat).

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Improbable (1)
Duration	Long term (4)	Medium-term (3)
Extent	Limited to Local Area (2)	Limited to Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**36 (Medium)**	**8 (Low)**
Status (positive or negative)	Negative	Negative

- Maintenance activities should not take place within watercourses or buffer zones. Where unavoidable, the footprint for maintenance must be kept to a minimum. This is subjected to authorization by means of a water use license.
- Where possible, maintenance within watercourses must be restricted to the drier winter months.
- Maintenance activities should not impact on rehabilitated or naturally vegetated areas.

Expected to be medium.

The Present Ecological Situation and Ecological Condition of the various subsections of the site will be improved by the rehabilitation exercise. None of the vertebrates will be displaced or disadvantaged by the rehabilitation. The latter will in fact boost the persistence and increase of the vertebrate species richness in an otherwise densely built-up residential area.
10. **Risk of Vandalism on Rehabilitated Dam and Its Associated Infrastructure**
Rehabilitate the embankment and spillway *with the addition of an outlet pipe that is placed over the embankment to form a Siphon* The problem with Option 2 is that the dam is situated in an area with a *high risk of vandalism*. The dam was originally constructed with outlet works consisting of an intake tower in the basin and an outlet pipe from the base of the tower that passes through the base of the embankment to the downstream end. A pedestrian bridge crossed from the embankment crest to the tower. As can be seen in Photographs 5 and 8 in the attached Appendix B, the pedestrian bridge has been removed by vandals. Furthermore; there have been several deaths in 2013-2014 at the abandoned power station building which is adjacent to the dam when the structure collapsed on vandals removing metal for scrap.

1. NO GO OPTION

No go Alternative (compulsory). This is the option of not rehabilitating the deteriorating Orlando PS Dam and its auxiliary infrastructure

Table 8: Potential impacts should the Development not be Approved **"No-Go" Alternative**

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Changing the quantity and fluctuation properties of the wetland: No-go would mean the study site carries on undisturbed.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Changing the amount of sediment entering wetlands - No-go would mean the study site carries on in its baseline condition	N – Medium	Implement the proposed rehabilitation measures of the dam and its basin	N – Medium	High risk
Erosion and Flooding, there is severe erosion encroaching towards the dam No-go would mean the study site carries on in its baseline condition	N – Very High	Implement the proposed rehabilitation measures of the dam and its basin	N – Very High	Very high risk to property and motorist should the dam fail
Alteration of water quality -. It is reported that the dam has some sewage leaks. No-go would mean the study site continues in its baseline condition	N – Medium	There are no mitigation measures	N– Low	Medium risk
Changing the physical structure within a water resource - No-go would mean the study site carry on undisturbed.	N – Low	There are no mitigation measures	N – Low	Low

Destruction of natural vegetation - No-go would mean the study site carries on the same with severe encroachment of vegetation into the facility compromising its functionality.	N – High	There are no mitigation measures	N –High	Low
Establishment of Alien Invasive Plants: During the site visit it was observed that numerous additional alien invasive species were present on site. The baseline conditions will remain the same	N – High	There are no mitigation measures	N – High	Baseline conditions will persist
Visual Impacts expected on the construction site. No-go would mean the study site carries on baseline condition	Negligible	There are no mitigation measures	Negligible	No risk
Noise Impacts anticipated. No-go would mean study site status quo is maintained.	Negligible	There are no mitigation measures	Negligible	No risk
Heritage Impacts and Probability of artifacts present on site. No heritage artifacts are expected to be in the study area.	Negligible	There are no mitigation measures	Negligible	No risk
Paleontological Impacts.				
Health and Safety. No-go would that the current existing safety hazards to motorist and houses on the buffer of the dam will continue to experience these safety risks.	N-High	The facility poses a safety risk to motorist and neighboring home owners	N-High	Baseline conditions will persist
Social-Economic Impact No-go would mean status quo remains the same, no job creation anticipated with the no – go option.	N-Medium		N-Medium	The opportunity cost is medium

Dust generated during vegetation clearing. No-go would mean study site status quo is maintained.	Negligible	There are no mitigation measures	Negligible	No risk

If the no go alternative is pursued, then the operational-related positive impacts will not be realised, no jobs will be created.

This alternative is not preferred as the applicant is providing a crucial service to the local community to control storm water runoff in the study area. Should the rehabilitation of the Dam and its basin not be implemented as proposed, the following below will continue.

- Damage to the upstream face of the embankment due to erosion caused by wave action which is initiated by wind.
- Seepage at the downstream toe of the embankment.
- The discharge capacity of the spillway capacity is insufficient
- The substantial vegetation which already is encroaching the discharge channel, flow depths will increase resulting in much lower discharge capacity for the spillway
- A risk to society

It is also worth noting that the study area is not a pristine environment, other existing impacts on site include the following

- Establishment of invasive plant species
- Disturbance of vegetation due to encroachment by housing and road developments
- The wetland on site has been completely transformed
- Other impacts associated with the dam include erosion, water pollution from sewage discharge which was evident by a strong sewerage small and foaming of the water, and exotic vegetation

In light of the above, the Dam and Its Basin will remain a hot spot risk area prone to severe erosion, flood risk due to the deterioration of the infrastructure due to age (the dam is over 80 years old) and thus exposing the community to safety hazards and pose a potential damage to property. The **No Go Option** is an **UNDESIRABLE OPTION** for the project as it will pose negative impacts on the social and economic perspective and is not considered desirable

Benefits of Undertaking Rehabilitation Works on Site.

The potential positive impacts of the proposed remedial works include the following:

- Improved water quality
- Enhanced ecological function of the Dam and the surrounding wetlands
- Reduce land erosion (siltation and sedimentation)
- Improved overall visual quality of the selected sites
- Reduced flood risk
- Removal and reduced spreading of alien plant species infestation
- The Present Ecological Situation and Ecological Condition of the various subsections of the site will be improved by the rehabilitation exercise.
- The wetland specialist reported that the wetland system in the Study Area is in a critical condition and no longer provides many services it would have provided in its reference state, including water energy attenuation, sediment trapping and support of high biodiversity. It is likely that rehabilitation of the system as a whole will improve the PES and EC scores. Impacts on the wetland include damage caused by erosion, sedimentation and alien invasions. These issues will be attended to by the rehabilitation.
- Public safety
- Employment opportunities and skills transfer

The negative impacts of the No Go Option Alternative are considered to outweigh the positive impacts of this alternative.

The No Go Option is therefore not preferred.

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

- G1: Wetland Assessment Report
- G2: Vegetation Assessment Report
- G3: Fauna Assessment Report
- G4: Heritage Assessment Report
- G5: Paleontological Desktop Study

Describe any gaps in knowledge or assumptions made in the assessment of the environment and the impacts associated with the proposed development.

EAPs Assumptions

- All information provided to EAP by the applicant was accurate and up to date.

Wetland specialist Assumptions

The recreation grade GPS used for wetland and riparian delineations is accurate to within five meters. Therefore, the wetland delineation plotted digitally may be offset by at least five meters to either side. Furthermore, it is important to note that, during the course of converting spatial data to final drawings, several steps in the process may affect the accuracy of areas delineated in the current report. It is therefore suggested that the no-go areas identified in the current report be pegged in the field in collaboration with the surveyor for precise boundaries. The scale at which maps and drawings are presented in the current report may become distorted should they be reproduced by for example photocopying and printing.

Heritage Assumptions

Assumptions and Limitations

- The investigation has been influenced by the following factors:
- It is assumed that the description of the proposed project, provided by the client, is accurate.
- No subsurface investigation (i.e. excavations or sampling) were undertaken, since a permit from SAHRA is required for such activities.
- It is assumed that the public consultation process undertaken as part of the Environmental Impact Assessment (EIA) is sufficient and that is does not have to be repeated as part of the heritage impact assessment.
- The unpredictability of buried archaeological remains.
- This report does not consider the paleontological potential of the site.

Ecological Assumptions

- Even though every care is taken to ensure the accuracy of this report, environmental assessment studies are limited in scope, time and budget. Discussions and proposed mitigations are to some extent made on reasonable and informed assumptions built on bone fide information sources, as well as deductive reasoning. Deriving a 100% factual report based on field collecting and observations can only be done over several years and

seasons to account for fluctuating environmental conditions and migrations. Since environmental impact studies deal with dynamic natural systems additional information may come to light at a later stage.

2. IMPACTS THAT MAY RESULT FROM THE DECOMISSIONING AND CLOSURE PHASE

Briefly describe and compare the potential impacts (as appropriate), +significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Proposed and Alternative Rehabilitation Designs

Potential impacts:	**Significance rating of impacts(positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
It is not foreseen that the proposed development would reach a decommissioning and closure phase due to the nature of the development (Storm water attenuation facility). Impacts associated with the decommissioning phase were therefore not assessed.				

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

Not Applicable

Where applicable indicate the detailed financial provisions for rehabilitation, closure and ongoing post decommissioning management for the negative environmental impacts.

On-going post decommissioning management cost will not be determined for this development due to the nature of the development. The developer JRA is the Organ of State responsible for storm water infrastructure management and according to the Johannesburg Metropolitan Municipality IDP 2017/2018, the construction and upgrade of storm water infrastructure was identified by Municipality as one of the infrastructure that requires attention. The JRA received an allocation of R 2 523 210 000 for 2018/19. This is a 70% year on year increase for the municipal entity, and continues the entity's commitment to improving roads, bridges and storm water infrastructure. Of the R 2 523 210 000 received approximately R46 million of the financial allocation goes for storm water related projects. This also includes the rehabilitation of the environment that is damaged during works. However, the detailed financial provisions for this development could not be determined at this stage.

3. CUMULATIVE IMPACTS

Describe potential impacts that, on their own may not be significant, but is significant when added to the impact of other activities or existing impacts in the environment. Substantiate response:

Cumulative impacts can result from actions which may not be significant on their own but which are significant when added to the impact of other similar actions. The Dam and its immediate surroundings are highly transformed with dense residential and housing development and road infrastructure. Existing impact on the Dam and riparian areas include the following:

- Encroachment of development (housing developments, and road infrastructure onto wetland areas,
  Vegetation encroachment of the Dam
- Alien plant invasion
- Erosion on the upstream of the Dam
- High velocities of urban runoff into the catchment/watercourse

The anticipated **Cumulative Impacts** of this development (for both the Proposed- Structural Design Alternative 1 and Structural Design Alternative 2-) includes the following:

- **Spread on Alien Invasive Plant species**
  The study site is infested with alien (exotic) plant species, disturbance during construction if not controlled will result in more of these plants occurring on site as such plant species proliferate in disturbed areas. The potential cumulative impact on vegetation is rated as having a **low significance** with the implementation of mitigation measures.

- **Loss of Indigenous Vegetation**
  There is impact on site vegetation due to severe encroachment by residential development and the subsequent spread of alien invasive species. The rehabilitation measures on site may contribute to the cumulative impact through the clearance of vegetation during site preparations. Similarly construction activities on the banks, crest and spillway of the dam will necessarily encroach onto specialised habitat created by hydrophytic vegetation. The impact is anticipated to be **Medium** and can be reduced to **Low** significance through the implementation of suggested mitigation measures.
- **Encroachment of development onto wetland areas**
  Impacts associated with construction could increase the significance of this impact already present as a result of other activities in the area such as housing developments, commercial infrastructure and roads. The potential cumulative impact is **Medium significance** with or without mitigation.

Positive Cumulative Impacts
Social environment.

- The development may have positive social impacts during construction through the provision of job opportunities to local people and improving on skills transfer. The impact will be Medium with or without enhancement.
- The Dam is used by local for recreation activities such as rowing and the rehabilitation measures will improve the function of the Dam. The overall impact will be Positive Medium with or Without Enhancement

Responsible environmental management will be required during the entire project life cycle. These management measures should be guided by the **Environmental Management Plan,** attached as **Appendix H**

4. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposal and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Comparison of Structural Rehabilitation Design Alternative 1 (Proposed & Preferred) and Structural Rehabilitation Design Alternative 2.

This section provides a summary of the environmental assessment and conclusions drawn for the Proposed rehabilitation of the Orlando PS Dam in Klipsruit, City of Johannesburg, Gauteng Province. This can be achieved either via the Constructing and upgrading the facility using Structural Design Alternative 1 (Proposed & Preferred) or Structural Design Alternative 2 Remedial Measures. The two Options will be compared. In doing so, it draws on the information gathered as part of the Basic Assessment process and the knowledge gained by the environmental consultant during the course of the process and presents an informed opinion of the environmental impacts associated with the proposed project.

The proposed activities assessed within this Basic Assessment Report are required to provide essential remedial works in the study area "The Proposed Rehabilitation of Orando PS Dam in Klipspruit, City of Johannesburg, Gauteng Province". In summary, the Basic Assessment has assessed potential impacts and identified appropriate management and mitigation measures.

CONSTRUCTION PHASE EVALUATION OF ALTERNATIVES

CONSTRUCTION PHASE, The anticipated impacts during rehabilitation of the Orlando Ps Dam and its basin via Structural Design Alternative 1 OR Structural Design Alternative 2 during the construction phase are similar with the same level significance, the identified impacts are in the majority of Medium Significance before mitigation.

The impacts can also be effectively mitigated to have a **Low Significance** provided the prescribed mitigation measures are implemented. As detailed above the impacts of the two Structural designs on the biophysical and social environment do not differ from one another.

ENVIRONMENTAL CUMULATIVE IMPACTS that can be expected to arise as a result of the project proceeding in either way of implementation include the following:

Negative Cumulative Impacts

- Spread of alien vegetation
- Encroachment of the development into wetland areas
- Loss of indigenous vegetation

These costs are expected to occur at a site and local level and are considered acceptable provided the mitigation measures as outlined in this Basic Assessment and **EMPr** attached in **Appendix H** are implemented.

OPERATION PHASE EVALUATION OF ALTERNATIVES

OPERATION PHASE, The impacts during operation for the Structural Design Alternative 1 (Preferred) and Structural Design Alternative 2 are similar. The identified negative impacts have **Medium-Low** significance and can be effectively mitigated to have a lower significance impact rating after management and mitigation. Refer to the summary of the operations impact table in Table 10, of this report. However the difference emanates from the below Table 1

Table 1: Qualitative Evaluation of Alternative Solutions during Operation

ITEM	Structural Design Alternative 1	Structural Design Alternative 2
1. Safety	Comparable	Comparable
2. Capital Cost	less expensive as designs comes without the addition of an outlet pipe	more expensive with the addition of an outlet pipe that is prone to vandals and will require regular replacement once stolen
3. Hydraulic efficiency	Comparable	Comparable
4. Maintenance	Low	Very High due to vandals
5. Vandalism Prone	Low (no removable parts and scrap value)	Very High (removable parts and scrap value) e.g. outlet pipe

PREFERRED ALTERNATIVE

On the basis of the foregoing comparisons in Tables 1 above, and capital cost estimates, The problem with option 2 is that the dam is situated in an area with a high risk of vandalism. The dam was originally constructed with outlet works consisting of an intake tower in the basin and an outlet pipe from the base of the tower that passes through the base of the embankment to the downstream end. A pedestrian bridge crossed from the embankment crest to the tower. As can be seen in Photographs 5 and 8 in the attached Appendix B, the pedestrian bridge has been removed by vandals.

Benefits that will arise from the rehabilitation of the site include the following

- The proposed development will result in important economic benefits at the local and regional scale through job creation, procurement of materials for construction and provision of services. These will extend beyond the site and would be experienced at

local and regional scale.

- The development will assist to keep residences and infrastructure from flooding continually during minor and major storm events, which in turn results in further damage to property and infrastructure.
- It is likely that rehabilitation of the system as a whole will improve the PES and EC scores.
- The Present Ecological Situation and Ecological Condition of the various subsections of the site will be improved by the rehabilitation exercise. None of the vertebrates will be displaced or disadvantaged by the rehabilitation. The latter will in fact boost the persistence and increase of the vertebrate species richness in an otherwise densely built-up residential area.
- Impacts on the watercourse (Dam) include damage caused by siltation, overgrown vegetation, failed dam infrastructure due to age (the dam is over 80 years old), sedimentation and alien invasions, these issues will be attended to by the rehabilitation.
- Facilitating the storage and movement of water through the system to reduce the risk of flooding residential properties
- Reducing access to and the transport of sediment through the reaches
- Encouraging the contact of water under base and low to moderate flow conditions to contact with environments that can trap and transform dissolve and suspended contaminants associated with urban runoff. These environments include both impoundments that afford extended residence times and appropriately engineered and planted vegetated systems.
- Alleviating poverty in the community through the creation of job opportunities and procurement of construction material, form local businesses during the construction phase.
- Improve on the community recreational activities such as the current recreational fishing activities on the dam by locals

The benefits of the project are expected to outweigh the costs.

Project Implementation Measures exist with respect to the rehabilitation of the Orlando PS Dam which could be rehabilitated using either the "**Structural Design Alternative 1 Remedial (Proposed)**"" OR **Structural Design Alternative 1 Remedial.** Both options would have the same net effect on the environment.

In conclusion, From an environmental perspective no environmental fatal flaws have been identified from either of way of implementing the project. However, from a technical and

cost perspective **Option 2** is **Not Preferred** for the fact that the Orlando PS dam is situated in an area with a high risk of vandalism. The dam was originally constructed with outlet works consisting of an intake tower in the basin and an outlet pipe from the base of the tower that passes through the base of the embankment to the downstream end. A pedestrian bridge crossed from the embankment crest to the tower. As can be seen in Photographs 5 and 8 in the attached Appendix B, the pedestrian bridge has been removed by vandals.
Based on the above **Option 1 is preferred**.

Structural Design Alternative 2

See above, the impacts are similar with minor difference only from a technical and cost perspective and therefore compared collectively**.**

Alternative 2 Design

N/A

No-go (compulsory)

The `**do nothing alternative**` is the option of not undertaking remedial works on site. This alternative would result in no additional environmental impacts on the site or its surrounding area. Nonetheless, the site itself has some existing impacts therefore it is not a pristine environment.

Identified Problems on Site that require remediation works

- Seepage at embankment toe
- Erosion at Upstream Slope
- Insufficient spillway capacity, this can lead to overtopping of the embankment during the peak flood event
- There are signs of the precast concrete panels having been undermined due to seepage flow through the foundation. There is a risk of these concrete panels becoming dislodged during high spillway discharge events

Should the remedial works not be undertaken on site, the above will persist and this"will limit the JRA`s potential to provide the required services in the area and cumulatively in the broader region of Johannesburg.

- Johannesburg Road Agency will be failing to carry out their legislative mandate towards the realization of provision of aforementioned services where required.
- Flooding and erosion encroachment into private property, thus pose a risk to immediate surrounding properties and roads.
- No anticipated job opportunities from the development will be created should the no go option be pursued.

- The community will remain an unhappy community.

In summary, the situation on the ground will remain the same and The **`Do Nothing Alternative`** will not assist Johannesburg Road Agency in addressing issues that require quick emergency response as detailed above. The cost of the **`Do Nothing Alternative`** are expected to outweigh the benefits and therefore this alternative is **not a preferred alternative**

5. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

For Structural Design Alternative 1 and Structural Design Alternative 2

Table 9: Impact Summary table : Alternative Activity 1 (Preferred Activity) and Activity Alternative 2 (Less Preferred)- CONSTRUCTION IMPACTS

Nature of Impact	Structural Design Alternative 1		Structural Design Alternative 2	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Changing the water flow regime of the watercourse	**Medium (36)**	**Low (18)**	**Medium (36)**	**Low (18)**
Sedimentation and Change in turbidity of the watercourse	**Medium (52)**	**Low (18)**	**Medium (52)**	**Low (18)**
Alteration of water quality due to pollution	**Medium (42)**	**Low (18)**	**Medium (42)**	**Low (18)**
Loss of natural vegetation	**Medium (50)**	**Medium (35)**	**Medium (50)**	**Medium (35)**
Spread of Alien Invasive Plant species	**Medium (39)**	**Low (18)**	**Medium (39)**	**Low (18)**
Soil compaction & subsequent impacts on the seed bank	**Medium (42)**	**Low (24)**	**Medium (42)**	**Low (24)**
Soil Erosion & subsequent sedimentation	**Medium (42)**	**Low (24)**	**Medium (42)**	**Low (24)**
Loss of Fauna, birds and Hepertofauna	**Low (24)**	**Low (12)**	**Low (24)**	**Low (12)**
Visual Impact	**Medium (30)**	**Low (20)**	**Medium (30)**	**Low (20)**

Noise pollution	**Medium (30)**	**Low (18)**	**Medium (30)**	**Low (18)**
Impact on Heritage	**N/a**	**N/a**	**N/a**	**N/a**
Health, Safety & Security Risk	**Medium (36)**	**Low (12)**	**Medium (36)**	**Low (12)**
Pollution caused by inappropriate management and handling of waste	**Medium (40)**	**Low (24)**	**Medium (40)**	**Low (24)**
Soil, surface and groundwater pollution	**Medium (48)**	**Low (24)**	**Medium (48)**	**Low (24)**
Air Quality Impact	**Medium (40)**	**Low (18)**	**Medium (40)**	**Low (18)**
Positive Environmental Impacts	**Without Enhancement**	**With Enhancement**	**Without Enhancement**	**With Enhancement**
Social Economic impacts	**Medium +(30)**	**Medium ++(36)**	**Medium +(30)**	**Medium ++ (36)**

Table 10 : Impact Summary table : Structural Design Alternative 1 and Structural Design Alternative 2 - OPERATION IMPACTS

Nature of Impact	Structural Design Alternative 1		Structural Design Alternative 2	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Changing the fluctuation properties of the watercourse by for example restricting water flow	**Medium (33)**	**Low (16)**	**Medium (33)**	**Low (16)**

Sedimentation of the watercourse	**Medium (33)**	**Low (18)**	**Medium (33)**	**Low (18)**
Changing the water quality due to foreign material	**Low (24)**	**Low (16)**	**Low (24)**	**Low (16)**
Introduction & spread of alien invasive plant species	**Low (24)**	**Low (18)**	**Low (24)**	**Low (18)**
Cost of Maintenance	Low	Low	Very High due to vandals	Very High due to vandals
Vandalism Prone	Low (no removable parts and scrap value)	Low (no removable parts and scrap value)	Very High (removable parts and scrap value) e.g. outlet pipe	Very High (removable parts and scrap value) e.g. outlet pipe

For alternative:

During construction and operation phases of the development. It is noted that the impacts of Structural Design Alternative 1 and Structural Design Alternative 2 are similar from an environmental perspective. The impacts can all be reduced to low after mitigation. However from a maintenance cost and risk of vandalism Option has a high cost of maintenance and also is prone to vandalism due to the (removable parts and scrap value) e.g. outlet pipe that is proposed to be placed that is placed over the embankment to form a Siphon.

For details, please Refer to the assessment table above.

6. SPATIAL DEVELOPMENT TOOLS

Indicate the application of any spatial development tool protocols on the proposed development and the Outcome thereof.

Provincial Spatial Development Framework (PSDF)
The Gauteng PSDF is a provincial and strategic planning policy that responds to and complies with in particular the National Development Plan vision 2030 and the National Spatial Development perspective (NSDP). This framework promotes a developmental state in accordance to the principals of global sustainability as is stated by among others, the South African constitution and enabling legislation. The Gauteng PSDF is based on six growth and development pillars, each of which has its onset of drivers with long term-programmes. Pillar 1 highlights the job creation. The proposed development will create jobs opportunities during the construction phase, these employment opportunities will target local community members that are usually excluded from mainstream economic and formal employment. Therefore, the development is in line with the Gauteng PSDF.
Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).
The study area falls within Region C of the City of Johannesburg Metropolitan Municipality,. The project will not compromise the IDP objectives but would rather assist the Local Municipality entity (Johannesburg Road Agency) in achieving the performance areas as identified by the Local Municipality. The City of Johannesburg Spatial Development Framework (SDF) is a key legislative mechanism and integral component of the IDP providing a citywide perspective of spatial challenges and interventions. The SDF and associated Regional Spatial Development Frameworks (RSDFs) seek to guide, direct and facilitate both public and private development, investment and growth within the City in a manner that will expand opportunities and contribute towards the visible upliftment of all communities in the City (City of Johannesburg, Spatial Development Framework, 2010-2011). As such the City of Johannesburg SDF suggests among others the following undertakings: ▪ An interconnected system of green open spaces supporting viable ecological systems; ▪ Protect wetland systems, riparian zones, and key natural drainage areas; ▪ Protect priority habitats and biodiversity areas; ▪ Establish a network of open spaces that contribute to social and environmental opportunities. In light of the above this project is in line with the City's SDF. This project aims at rehabilitating the Dam system which has suffered stress from erosion, siltation, spread of

alien invasive plant species etc. Overall scores show that the wetland system on site is in a critical condition and no longer provides many services it would have provided in its reference state, including water energy attenuation, sediment trapping and support of high biodiversity. The Present Ecological Situation and Ecological Condition of the various subsections of the site will be improved by the rehabilitation exercise

Level Of Unemployment: The IDP states that unemployment in Johannesburg calculated on official figures was approximately 25% in 2011 down from approximately 29.6% in 2001. Approximately 65.8% of the household heads in Johannesburg are unemployed. The significant number of the population not economically active pushes up the dependency ratio. The remedial works on site infrastructure will contribute to the social benefit that include job creation and skills transfer that will occur during the construction phase of the project, increased employment and skills transfer is aligned with the Municipalities Development Plans.

Level Of Unemployment: The IDP states that unemployment in Johannesburg calculated on official figures was approximately 25% in 2011 down from approximately 29.6% in 2001. Approximately 65.8% of the household heads in Johannesburg are unemployed. The significant number of the population not economically active pushes up the dependency ratio. The remedial works on site infrastructure will contribute to the social benefit that include job creation and skills transfer that will occur during the construction phase of the project, increased employment and skills transfer is aligned with the Municipalities Development Plans.

7. RECOMMENDATION OF THE PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner as bound by professional ethical standards and the code of conduct of EAPASA).	YES [redacted]

If "NO", indicate the aspects that require further assessment before a decision can be made (list the aspects that require further assessment):

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

In conclusion, from an environmental perspective no environmental fatal flaws have been identified from either of way of implementing the project. The activity is limited to repair and upgrade of a man-made structure within an existing tributary and ecological corridor. The area has therefore been historically impacted and the proposed rehabilitation activities are unlikely to significantly alter the current status of the site, rehabilitation works will improve the ecological status of the Dam. From an environmental perspective the upgrade of the Dam can be allowed to proceed.

The following mitigation measures should be taken into consideration.

- The EMPr should be a legal binding document and an extension of the Environmental

authorization if issued by GDARD

- The appointed contractor should be contractually bound to comply with the conditions of the EMPr
- An independent ECO should be present during construction to monitor the implementation of the EMPr and the environmental authorization once issued and compile monthly audit report for submission to the relevant authorities
- Avoid, as far as reasonably possible, disturbing wetlands within the study area. Where this is unavoidable, appropriate remediation steps must be taken
- Works should only be undertaken on the authorized properties
- All relevant legislation and requirement of other government departments (National, Provincial), in particular of Section 28 (duty of care) of NEMA, must be complied with.
- In the event of a major incident (e.g. fire causing damage to property and environment, major spill or leak of contaminants), the relevant authorities should be notified as per the notification of emergencies/ incidents, as per the requirements of section 30 of NEMA.
- An Integrated Water Use License must be obtained from Department of Water and Sanitation prior to the commencement of construction activities.
- Compliance with all legal requirements in relation to environmental management and conditions of the authorization issued by GDARD.
- Construction noise on site must not exceed 85DB as required by the Health and Safety Act
- Remedial works in the watercourse should preferably be undertaken during the drier months of the year.
- The site after construction in areas where it has been disturbed must be rehabilitated back to its original state, if not possible to a state that conforms to the principles of sustainable development.

8. THE NEEDS AND DESIREBILITY OF THE PROPOSED DEVELOPMENT *(as per notice 792 of 2012,*

or the updated version of this guideline)

Current Baseline Conditions:

- The Orlando Dam is over 80 years old; hence the structure is failing due to old age, erosion, vandalism, overgrown vegetation thus compromising the function of the infrastructure. The proposed rehabilitation works will essentially be rehabilitating of the existing structures. Reconstruction of the embankment crest might result in a

nominal increase in height of the embankment. The existing spillway crest levels will remain as it is currently. The water level in the reservoir will therefore remain unchanged. The upgrades to the spillway will repair the damaged lining. The spillway capacity will unchanged

- The holding capacity of the Dam has been compromised due to siltation and overgrown vegetation within the Dam infrastructure

The aim of the project is to address erosion and flooding of the Dam, its basin and immediate surroundings by implementing stabilization and remedial works of the Orlando PS Dam. This will allow for the best positive change in the health of the stream and thereby increasing its Ecological Importance.

Need and Desirability of the Proposed Project include among others:

- The statutory third dam safety inspection of Orlando dam was carried including the latest one from 2019 recommended that rehabilitation measures be implemented to ensure the continued safe functioning of the dam: Several findings were made with regards to the condition of the dam. The dam was found to be in generally a poor condition with excessive vegetation on the embankment slopes and visible seepage at the downstream toe of the embankment. Benching has also occurred at the upstream slope as a result of erosion due to wave action.

The Rehabilitation of the Dam will address areas of concern outlined above.

- Dams provide a range of economic, environmental, and social benefits, including recreation, flood control, water supply. Currently the dam is used for recreational fishing by the community. There is a need to rehabilitate the Dam to ensure safety of lives and damage to property is very critical.
- The remedial works will keep residences and infrastructure within the immediate vicinity of the Orlando PS Dam from the risk of the dam failing and causing a massive flooding that can cause damage to property
- Job creations and skills transfer during construction

Overall, rehabilitation will inter alia address erosion, flooding, Siltation, infrastructure failure and alien species invasions.

9. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED (Consider when the activity is expected to be concluded)

Duration and Validity: The environmental authorization is required for a period of 10 years from the date of issue. Should a longer period be required, the applicant/EAP will be required to provide a detailed motivation on what the period of validity should be

10. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

(must include post construction monitoring requirements and when these will be concluded.)

If the EAP answers "Yes" to Point 7 above then an EMP is to be attached to this report as an Appendix

EMPr attached	YES

SECTION F: APPENDIXES

The following appendixes must be attached as appropriate (this list is inclusive, but not exhaustive):

It is required that if more than one item is enclosed that a table of contents is included in the appendix

Appendix A: Site plan(s) – (must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)

Appendix A: Site plan(s)
A1: Locality Map
A2: Layout Plan overlain on Sensitivity Maps
Appendix B: Photographs
Appendix C: Facility illustration(s)
Appendix D: Route position information (N/a)
Appendix E: Public participation information

- Appendix E1: Proof of site notice
- Appendix E2: Proof of Stakeholder Consultation
- Appendix E3: Proof of newspaper advertisements
- Appendix E4: Authority Consultation
- Appendix E5: Minutes of any public and/or stakeholder meetings- No public meeting has been held as yet, this will be held during Public Review of the DBAR
- Appendix E6: Comments and Responses Report
- Appendix E7: Comments from I&APs on Draft Basic Assessment (BA) Report - Comments are anticipated during the Draft BAR review period
- Appendix E8: Comments from I&APs on amendments to the BA Report **(N/a)**
- Appendix E9: I&APs and Registered I&APs Database
- Appendix E10: Comments from I&APs on the application

Appendix F: Water use license(s) authorization, SAHRA information, service letters from municipalities, water supply information
Appendix G: Specialist reports

- G1: Wetland Specialist Report
- G2: VgetationAssessment Report
- G3: Fauna Assessment Report
- G4: Heritage Assessment Report
- G5: Paleontological Desktop Report

Appendix H: EMPr

- H1: Wetland Rehabilitation Plan
- H2: Landscape Plant Species Plan

Appendix I: Other information

- I1: EAP declaration and Expertise
- I2: Specialists Expertise

CHECKLIST
To ensure that all information that the Department needs to be able to process this application, please check that:

- Where requested, supporting documentation has been attached;
- All relevant sections of the form have been completed.