Report No: 113223/12032b

WORKING FOR WETLANDS REHABILITATION PROGRAMME, LIMPOPO

BASIC ASSESSMENT REPORT
OCTOBER 2019

Agriculture, Forestry and Fisheries
Environmental Affairs
Water Affairs and Sanitation

Working for Wetlands

EXPANDED PUBLIC WORKS PROGRAMME
Creating opportunities towards human fullfilment

This page was left blank intentionally

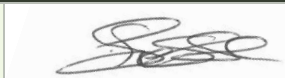
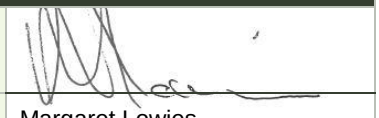
Document control record

Document prepared by:

Aurecon South Africa (Pty) Ltd
Reg No 1977/003711/07
Aurecon Centre
1 Century City Drive
Waterford Precinct
Century City
Cape Town 7441
PO Box 494
Cape Town 8000
South Africa

T +27 21 526 9400
F +27 21 526 9500
E capetown@aurecongroup.com
W aurecongroup.com

Document control					aurecon
Report title		Working for Wetlands Rehabilitation Programme, Limpopo			
Document ID		12032a	**Project number**		113223
File path		P:\Projects\113223 Plan & Env Comp Work for Wetlands\Enviro\7 DEL SERV\701 Provinces\Limpopo\2018_2019\Reports\BAR\Soutini-Baleni\Re-application			
Client		Working for Wetlands Programme			
Client contact		Dr Farai Tererai	**Client reference**		WfWetlands: LP BAR
Rev	**Date**	**Revision details/status**	**Author**	**Reviewer**	**Approver**
0	11 February 2019	**Draft for PPP**	**Pearl Rakeepile**	**Franci Gresse**	**Claire Blanche**
1	June 2019	**Draft for PPP**	**Pearl Rakeepile**	**Franci Gresse**	**Claire Blanche**
2	October 2019	**Draft for PPP**	**Pearl Rakeepile**	**Franci Gresse**	**Margaret Lowies**
Current revision		**1**			

Approval			
Reviewer signature		Approver signature	
Name	Franci Gresse	Name	Margaret Lowies
Title	Project Leader	Title	Manager

Please note that this report was previously made available for public comment in February 2019 and June 2019. Due to an unforeseen delay during the submission of the finalised reports to the Department of Environmental Affairs, the application for Environmental Authorisation lapsed, and a new application has been lodged with the Department. All comments received during the first application has been incorporated in the Public Participation Report (Appendix B).

NEMA requirements for Basic Assessment Reports		aurecon
Appendix 1	**Content as required by NEMA**	**Page**
3(1)	A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include -	
(a)	(i) details of the EAP who prepared the report; and	Section 8.2 and Appendix F
	(ii) details of the expertise of the EAP, including curriculum vitae;	
(b)	the location of the activity, including-	Section 1.1.1
	(i) the 21 digit Surveyor General code of each cadastral land parcel;	
	(ii) where available, the physical address and farm name;	
	(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	N/A
(c)	a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is-	Figure 1 and Chapter 6
	(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	N/A
	(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	N/A
(d)	a description of the scope of the proposed activity, including-	
	(i) all listed and specified activities triggered and being applied for; and	Chapter 2
	(ii) a description of the activities to be undertaken, including associated structures and infrastructure;	Section 5.2
(e)	a description of the policy and legislative context within which the development is proposed including -	Chapter 2
	(i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and	
	(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	
(f)	a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 5.1
(g)	a motivation for the preferred site, activity and technology alternative;	Chapter 5
(h)	a full description of the process followed to reach the proposed preferred alternative within the site, including -	Section 5.3
	(i) details of all the alternatives considered;	
	(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Chapter 4 and Appendix B
	(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	
	(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 6
	(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Chapter 7
	(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 3.2
	(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 7

	(viii) the possible mitigation measures that could be applied and level of residual risk;	
	(ix) the outcome of the site selection matrix;	N/A
	(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	Section 5.3
	(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	N/A
(i)	a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including -	Chapter 3 and 7
	(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and	
	(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	
(j)	an assessment of each identified potentially significant impact of risk, including -	Chapter 7
	(i) cumulative impacts;	
	(ii) the nature, significance and consequences of the impact and risk;	
	(iii) the extent and duration of the impact and risk;	
	(iv) the probability of the impact and risk occurring;	
	(v) the degree to which the impact and risk can be reversed;	
	(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and	
	(vii) the degree to which the impact and risk can be avoided, managed or mitigated;	
(k)	where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Chapter 8
(l)	an environmental impact statement which contains -	
	(i) a summary of the key findings of the environmental impact assessment;	
	(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and	Provided in the project specific rehabilitation plans.
	(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Chapter 8
(m)	based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the impact management outcomes for the development for inclusion in the EMPr;	
(n)	any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	
(o)	a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 3.3
(p)	a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 8.2
(q)	where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	Section 8.2
(r)	an undertaking under oath or affirmation by the EAP in relation to-	Appendix F
	(i) the correctness of the information provided in the report;	
	(ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and	
	(iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	

(s)	where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
(t)	any specific information that may be required by the competent authority; and	N/A
(u)	any other matter required in terms of section 24(4)(a) and (b) of the Act.	N/A

EIA Screening Tool

Regulation 16(1)(v) of the Environmental Impact Assessment Regulations (Government Notice Regulation 982, 2014, as amended) requires that an application for environmental authorisation be accompanied by a report that has been generated by the national web based environmental screening tool.

This tool became operational on 4 October 2019 (Government Notice 42561 of 5 July 2019) and screens proposed sites for environmental sensitive features. In addition, the screening tool identifies specialist studies that may be applicable to the proposed site and/or development and should be undertaken during the application process. Should any of these assessments not be applicable the Environmental Assessment Practitioner can provide a motivation to this regard for the competent authority to consider.

Applicability of Screening Tool Results

Table A below provides a list of all specialist studies that were identified by the screening tool (see Appendix F) for developments undertaken in watercourse.

It is however **important to remember** that the WfWetlands Programme is **not a development proposal**, and although this programme technically requires Environmental Authorisation in terms of Regulations pursuant to NEMA, such **environmentally positive rehabilitation projects should not need to be assessed for negative environmental impacts associated with developments.**

The very **objective** of the WfWetlands Programme is to **improve both environmental and social circumstances**, while also **giving effect to a range of policy objectives** of environmental legislation, and **honouring South Africa's commitments** under several international agreements, especially the **Ramsar Convention on Wetlands**.

The legislation protecting the environment in South Africa was **not written with the intention of preventing wetland rehabilitation efforts**, but rather of c**urtailing development in sensitive environments.**

Therefore, legislative processes aimed at preventing negative environmental impact through development are really not applicable to a project of this nature and the project activities that trigger Listing Notices are only being undertaken to benefit the environment.

Table A: Screening tool results and applicability of specialist assessments for wetlands B82G-01, B82G-02 and B82G-03

Specialist Assessment	Applicable Themes	EAP motivation for Applicability
Landscape/ Visual	Civil aviation Defence	The objective of the proposed interventions is to rehabilitate a degraded wetland. These interventions are visually non-obtrusive and were designed with a minimum footprint. Please refer to Appendix C of the Soutini-Baleni Wetland Rehabilitation Plan for the proposed intervention designs. This specialist study is therefore not considered to be applicable to the WfWetlands Programme.

Specialist Assessment	Applicable Themes	EAP motivation for Applicability
Archaeological and cultural heritage	Archaeological and cultural heritage[1]	A specialist was appointed to assessment potential impacts on heritage resources as explained in Sections 2.1.3 and 6.3 of this report. Also see Appendix B5 for final comments received from the South African Heritage Resources Agency (SAHRA). No objections were raised by SAHRA.
Palaeontology	Palaeontology	According to the palaeontological sensitivity map of SAHRA, the site is not sensitive, and a palaeontological assessment is not required (Figure 10). This was confirmed by the appointed heritage specialist as indicated in Sections 2.1.3 and 6.3, as well as the comments received from SAHRA (see Appendix B5).
Terrestrial biodiversity Aquatic biodiversity	Terrestrial biodiversity Aquatic biodiversity Plant species	The objective of the proposed interventions is to rehabilitate degraded wetlands, which would help to improve the resilience of biodiversity to climate change, etc. Furthermore, the impact of the proposed rehabilitation interventions on habitat, aquatic ecology and associated wetland fauna and flora species were assessed by the wetland specialist in his Status Quo report *(*Appendix A of the Soutini-Baleni Wetland Rehabilitation Plan*)*. Also see Sections 6.2.1 and 7.2 for more information on the expected benefits to biodiversity. Please note that limited, short term, disturbances are expected during the construction phase, however, appropriate mitigation measures (that are based on more than 15 years' experience with wetland rehabilitation) have been identified and are included in the Environmental Management Programme. Where appropriate, site specific mitigation measures have been included in the Soutini-Baleni Rehabilitation Plan (see Appendix C of the rehabilitation plan). These additional specialist studies are therefore considered not to be applicable to the WfWetlands Programme for the following reasons: (a) the objective of the proposed project is to restore and improve the functioning and ecosystem services provided by the identified wetlands (including biodiversity); (b) these benefits have been assessed in the Status Quo report included in Annexure A of the Soutin-Baleni Wetland Rehabilitation Plan; (c) potential impacts (see Chapter 7) are known based on more than 15 years' experience rehabilitating wetlands in the Limpopo Province; and

[1] This theme was identified for only Wetland S32E-03 due to its proximity to an important wetland.

Specialist Assessment	Applicable Themes	EAP motivation for Applicability
		(d) appropriate mitigation measures have been included in the Soutini-Baleni Wetland Rehabilitation Plan and Environmental Management Programme (as confirmed with the wetland specialist).
Hydrology		The objective of the proposed interventions is to rehabilitate degraded wetlands, including restoring the natural hydrology of the affected wetlands. Interventions are identified and designed to have a minimum footprint, while achieving maximum environmental benefit to the wetlands. Please refer to Sections 6.2.1 and 7.2, as well as Annexure A of the Soutini-Baleni Wetland Rehabilitation Plan for more information on the expected benefits in terms of wetland hydrology. Note that limited, short term, disturbances are expected during the construction phase, however, appropriate mitigation measures (that are based on more than 15 years' experience with wetland rehabilitation) have been identified and are included in the Environmental Management Programme. Since the WfWetlands Programme is not proposing a development, but wetland rehabilitation interventions that would restore the natural hydrology of the degraded wetlands (as discussed in Annexure A of the Soutini-Baleni Wetland Rehabilitation Plan), a hydrology impact assessment is not considered to be applicable.
Socio-economic	Agriculture	The WfWetlands Programme pursues its mandate of wetland protection, wise use and rehabilitation in a manner that maximises employment creation, supports small emerging businesses, and transfers skills amongst vulnerable and marginalised groups. The WfWetlands Programme has a current budget of just over R 130 million, of which approximately 35% is allocated directly to paying wages. Being part of the EPWP, the WfWetlands Programme has created more than 34 000 jobs and over 3.2 million person-days of paid work. The local teams are made up of a minimum of 55% women, 65% youth and 2% disabled persons (see Section 5.1). Furthermore, interventions are carefully selected to prevent potential conflict with landowners as a result of landuse change (i.e. grazing in terms of these wetlands) and rather protect agricultural resources as required in terms of the Conservation of Agricultural Resource Act (Act 43 of 1983). In addition, no objections were received from the Department of Agriculture, Forestry and Fisheries (DAFF) during the previous public comment periods.

Specialist Assessment	Applicable Themes	EAP motivation for Applicability
		This specialist study is therefore not considered to be applicable to the WfWetlands Programme.
Animal species Plant species	Terrestrial biodiversity Aquatic biodiversity Plant species	The objective of the proposed interventions is to rehabilitate degraded wetlands, which would help to improve the resilience of plant and animal species to climate change, etc. Furthermore, the impact of the proposed rehabilitation interventions on habitat, aquatic ecology and associated wetland fauna and flora species were assessed by the wetland specialist in his Status Quo report (Appendix A of the Soutini-Baleni Wetland Rehabilitation Plan). For more information on the expected benefits to biodiversity, please refer to Sections 6.2.1 and 7.2. An assessment of the potential impact on plant and animals during the construction phase is included in Section 7.1 .6. This assessment is based on the team's experience of more than 15 years' with wetland rehabilitation projects. These specialist studies are therefore not considered to be applicable to the WfWetlands Programme.

CONTENTS

APPENDICES

FIGURES

TABLES

ABBREVIATIONS

ASD	Assistant Director: Wetlands Programmes
BAR	Basic Assessment Report
BGIS	Biodiversity Geographic Information Systems
CBA	Critical Biodiversity Area
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
LCP	Limpopo Conservation Plan
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EPWP	Expanded Public Works Programme
ESA	Ecological Support Area
GA	General Authorisation
GPS	Geographical Positioning System
IA	Implementing Agent
I&AP	Interested and Affected Party
NEMA	National Environmental Management Act (Act 107 of 1998) as amended
NFEPA	National Freshwater Ecosystem Priority Area
NHRA	National Heritage Resources Act (Act 25 of 1999)
NWA	National Water Act (Act 36 of 1998)
NWI	National Wetland Inventory Project
PPP	Public Participation Process
SMME	Small, Medium and Micro Enterprises
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WfWetlands	Working for Wetlands

GLOSSARY OF TERMS

Bedrock: The solid rock that underlies unconsolidated material, such as soil, sand, clay, or gravel (Cowden and Kotze, 2008).

Basic Assessment Report (BAR): A report as required in terms of the 2014 EIA Regulations, of the National Environmental Management Act, No. 107 of 1998 (NEMA) as amended, that describes the proposed activities and their potential impacts.

Biophysical: The biological and physical components of the environment (Cowden and Kotze, 2008).

Catchment: All the land area from mountaintop to seashore which is drained by a single river and its tributaries. Each catchment in South Africa has been subdivided into secondary catchments, which in turn have been divided into tertiary catchments. Finally, all tertiary catchments have been divided into interconnected quaternary catchments. A total of 1946 quaternary catchments have been identified for South Africa. These subdivided catchments provide the main basis on which catchments are subdivided for integrated catchment planning and management (Cowden and Kotze, 2008).

Development: The building, erection, construction or establishment of a facility, structure or infrastructure, *including associated earthworks* or borrow pits, that is necessary for the undertaking of a listed or specified activity, including any associated post development monitoring, but *excludes any modification, alteration or expansion* of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and *excluding the redevelopment of the same facility in the same location, with the same capacity and footprint*.

Development Footprint: in respect of land, means *any evidence of physical alteration* as a result of the undertaking of an activity (NEMA,1998).

Environmental Assessment Practitioner (EAP): The individual responsible for the planning, management and coordination of the environmental impact assessments, strategic environmental assessments, environmental management plans and/or other appropriate environmental instruments introduced through regulations of NEMA.

Ecosystem Services or 'eco services': The services such as sediment trapping or water supply, supplied by an ecosystem (in this case a wetland ecosystem).

Environmental Impact Assessment (EIA): A study of the environmental consequences of a proposed course of action via the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

Environmental Management Programme (EMPr): A detailed plan of action to organise and co-ordinate environmental mitigation, rehabilitation and monitoring during the implementation and maintenance of interventions identified under the WfWetlands Programme such that positive impacts are enhanced, and negative impacts are avoided/minimised.

Expansion: The *modification, extension, alteration* or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the *capacity* of the facility or the *footprint* of the activity is increased.

Indigenous Vegetation: Vegetation consisting of indigenous plant species occurring naturally in an area, *regardless of the level of alien infestation* and where the topsoil has not been lawfully disturbed during the preceding ten years.

Interested and Affected Parties (I&APs): People and organisations that have interest(s) in the proposed activities, also referred to as stakeholders.

Environmental Impact: An environmental change caused by some human act.

Implementer: The person or organisation responsible for the construction of WfWetlands rehabilitation interventions.

Intervention: A method of wetland rehabilitation that aims to address the objectives of the particular wetland system, namely to restore the hydrological integrity of the system and support associated biodiversity. It can be in the form of a hard (structures made of hard materials which are fixed (e.g. a concrete weir) or soft intervention (e.g. re-vegetation).

Mitigation: Actions to reduce the impact of a particular activity.

Maintenance: The replacement, repair or the reconstruction of an existing structure within the same footprint, in the same location, having the same capacity and performing the same function as the previous structure ('like for like').

Maintenance Management Plan: A management plan for maintenance purposes defined or *adopted by the competent authority.* [For WfWetlands, this is called a Rehabilitation Plan.]

Public Participation Process (PPP): A process of involving the public in order to identify issues and concerns and obtain feedback on options and impacts associated with a proposed project, programme or development. Public Participation Process in terms of NEMA refers to: a process in which potential interested and affected parties are given an opportunity to comment on or raise issues relevant to specific project matters.

Project: An area of WfWetlands intervention generally defined by a quaternary catchment or similar management unit such as a national park in which a single implementer operates.

Quaternary Catchment: "A fourth order catchment in a hierarchal classification system in which a primary catchment is the major unit" and that is also the "principal water management unit in South Africa" (DWS, 2011).

Rehabilitation: In the context of wetlands, refers to re-instating the driving ecological forces (including hydrological, geomorphological and biological processes) that underlie a wetland, so as to improve the wetland's health and the ecological services that it delivers.

Significant impact: An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Wetland: "Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water and which in normal circumstances supports or would support vegetation typically adapted to life in saturated soils." (National Water Act, 36 of 1998) *and* "Land where an excess of water is the dominant factor determining the nature of the soil development and the types of plants living there" (Cowden and Kotze, 2008).

This page was left blank intentionally

1 INTRODUCTION AND BACKGROUND

Working for Wetlands (WfWetlands) is a government programme managed by the Natural Resource Management (NRM) Programme of the Department of Environmental Affairs (DEA), and is a joint initiative with the Departments of Water and Sanitation (DWS), and Agriculture, Forestry and Fisheries (DAFF). In this way the programme is an expression of the overlapping wetland-related mandates of the three parent departments, and besides giving effect to a range of policy objectives, it also honours South Africa's commitments under several international agreements, especially the Ramsar Convention on Wetlands.

The programme is mandated to protect pristine wetlands, promote their wise-use and rehabilitate those that are damaged throughout South Africa, with an emphasis on complying with the principles of the Expanded Public Works Programme (EPWP) and using only local Small, Medium and Micro Enterprises (SMMEs). The EPWP seeks to draw significant numbers of unemployed people into the productive sector of the economy, gaining skills while they work and increasing their capacity to earn an income.

Due to the nature of the project, it is important to note that the very objectives of the WfWetlands Programme are to improve both environmental and social circumstances. The legislation protecting the environment in South Africa was not written with the intention of preventing wetland rehabilitation efforts, but rather of curtailing development in sensitive environments.

Throughout this report there will therefore be sections which guide the reader to understand how the minimum legal requirements (as required by the amended 2014 Environmental Impact Assessment (EIA) Regulations) will be met. It is important to note that the planning cycle of the WfWetlands Programme occurs annually, and continuously builds on existing information (dating back to the early 2000s). Each project cycle occurs within three phases (Refer to Section 3.1), with Phase 1 and Phase 2 occurring prior to implementation. Figure 1 on the following page provides an overview of how Phase 1 and 2 relate to the basic assessment process.

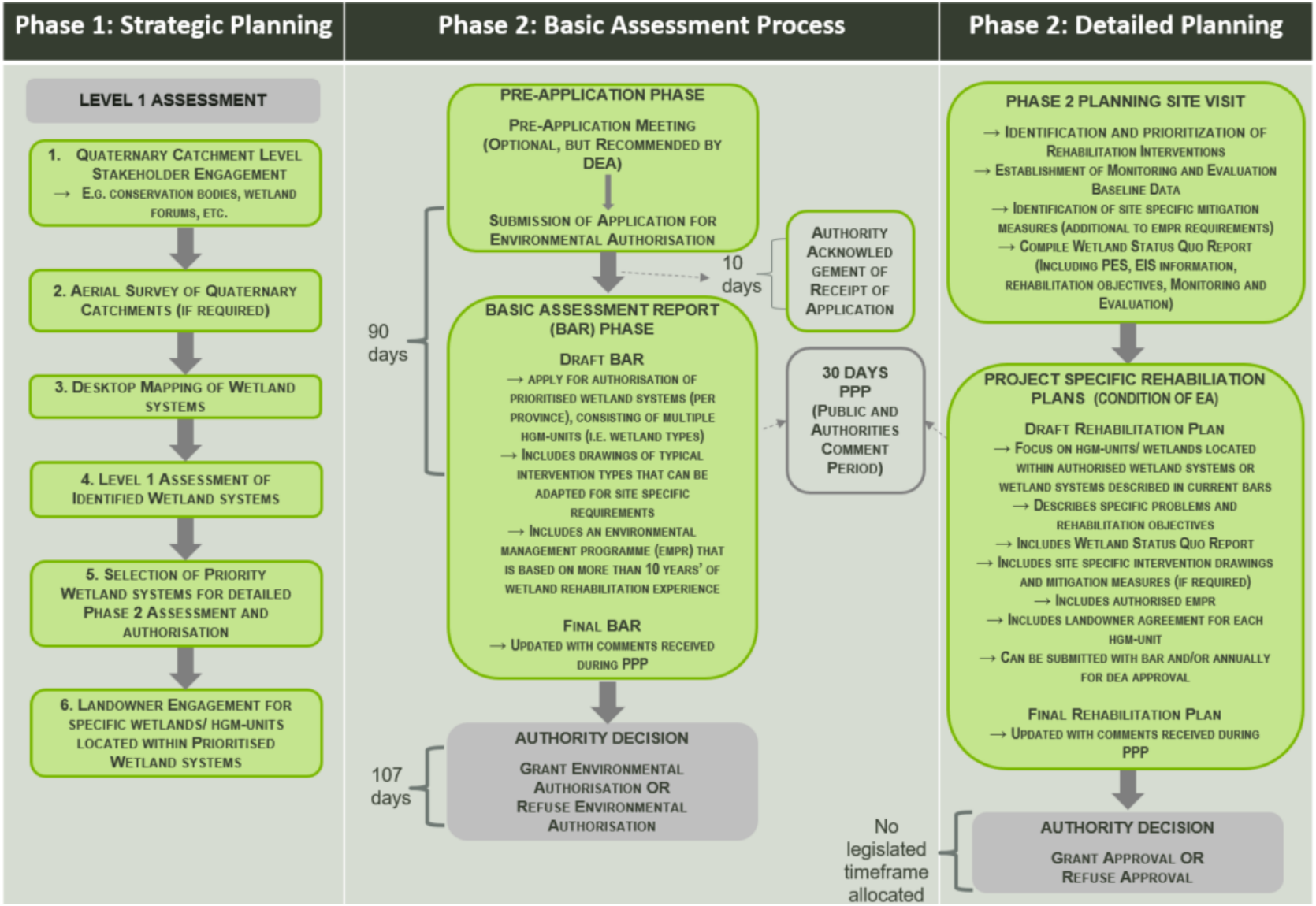


Figure 1: Overview of Phase 1 and 2 as part of the planning process.

1.1 Introducing the Project

The WfWetlands Programme is currently managing 48 WfWetlands Projects countrywide, including projects in the Limpopo Province. WfWetlands has actively been rehabilitating wetlands in the Limpopo Province since the early 2000s. Annually, the programme applies for Environmental Authorisation for a number of wetland systems for which rehabilitation plans are compiled during the course of the year. During 2018, only one new wetland system, Soutini-Baleni, was identified for rehabilitation purposes as rehabilitation efforts will continue within the wetland systems that received Environmental Authorisation during previous years. The Soutini-Baleni wetland was brought under the attention of the WFWetlands team in 2018 as a comment by the Chief of Mutale during the 30-day public participation comment period for the WFWetlands programme. The Chief made a request to the WFWetlands to include the wetland in their planning programme to undertake wetland rehabilitation activities at Soutini-Baleni. The wetland is a mineral hot spring that is culturally significant and used as a traditional Tsonga salt mining site. It is located approximately 20km southeast from the town of Giyani, and also falls within the borders of the Giyani Municipal District. The district is bordered in the east by the Kruger National Park, in the south by the Groot Letaba River and in the north by the Shingwedzi River, (Derwent, 2013).

1.1.1 Project Location

Table 1 below provides information on the location of the Soutini-Baleni wetland, as well as property details.

Table 2: Project details for Soutini-Baleni

Project Name	Soutini-Baleni	**Wetland System**	**Soutini-Baleni**
Quaternary Catchment	B82G	**Property Number**	Portion 24 of Farm 465
Property Size (ha)	37.787	**SG code**	T0LT00000000046500024
Lat (DDMMSS)	23° 25’ 9.87600’’S	**Long (DDMMSS)**	30° 54’ 42.84000’’E

1.1.2 Project Team

The team from Aurecon South Africa (Pty) Ltd (Aurecon), in partnership with GroundTruth, comprises of Design Engineers and Environmental Assessment Practitioners (EAPs) who undertake the planning, design and authorisation components of the project. The team is assisted by an external team of Wetland Specialists[2] who provide scientific insight into the operation of wetlands and expert local knowledge of the wetlands. The project team is also complimented by the Assistant Director for Wetlands Programme (ASDs) who are each responsible for a province.

The project team for the Limpopo Province includes the following professionals:

Table 3: Planning Team for Limpopo Province

Role	Representative	Company
ASD	Collin Silima	Department of Environmental Affairs, Natural Resource Management Programmes
EAP	Franci Gresse	Aurecon
Engineer	Cilliers Blaauw	Aurecon
Wetlander	Anton Linström	Wet-Earth Eco-Specs

[2] These Wetland Specialists are also referred to as Wetlanders in the Programme, and the two terms are used interchangeably. The individuals are selected based on their expertise in the province, and their involvement in the Wetland Society of South Africa.

Ms Franci Gresse acts as the EAP for the Limpopo Province and has been part of the WfWetlands Programme since 2010. Ms Gresse's signed EAP declaration and curriculum vitae (CV) can be found in **Appendix F.**

Specialist input is provided within this BAR by the provincial wetland specialist, however a specialist report does not accompany the report. A detailed assessment is however provided by a wetland specialist for the relevant rehabilitation plan. These assessments are undertaken in terms of the WET-Health methodology.

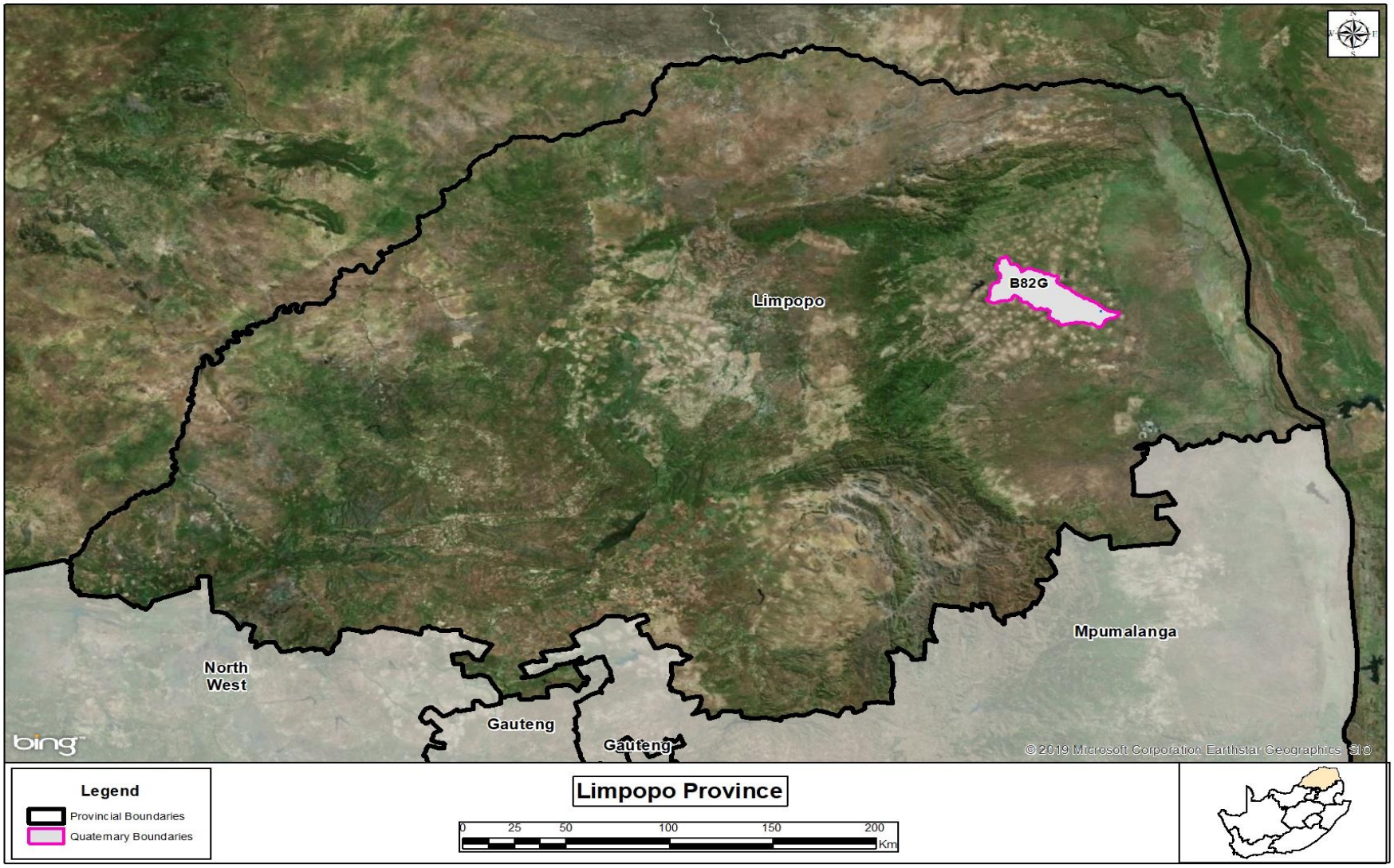


Figure 2: Locality map showing the location of quaternary catchments included in this BAR.

2 LEGAL AND PLANNING CONTEXT

One of the core purposes of the WfWetlands Programme is the preservation of South Africa's valuable wetland systems through rehabilitation and restoration.

South Africa has rigorous and comprehensive environmental legislation aimed at preventing degradation of the environment, including damage to wetland systems. The following legislation is of relevance:

- The National Environmental Management Act, No. 107 of 1998 (NEMA), as amended
- The National Water Act, No.36 of 1998 (NWA)
- The National Heritage Resources Act, No. 25 of 1999 (NHRA)

Development proposals within or near any wetland system are subject to thorough bio-physical and socio-economic assessment as mandatory processes of related legislation. These processes are required to prevent degradation of the environment and to ensure sustainable and environmentally conscientious development.

2.1 Relevant Legislation

There are a host of legal and policy documents and guidelines to consider when undertaking such a project. **Table 4** provides an overview of all the relevant legislation.

Table 4: Relevant Legislation, policies and guidelines considered in preparation of the Basic Assessment Report

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
Legislation			
Conservation of Agricultural Resources Act (Act 43)	The WfWetlands Programme is a rehabilitation proposal that aims to protect and conserve South Africa's wetland ecosystems. As such the listed legislation, policies and guidelines are all of relevance to the project.	Department of Agriculture, Forestry & Fisheries	1983
Constitution of South Africa (Act 108)		National Government	1996
National Environmental Management Act (107) (NEMA) (as amended)		Department of Environmental Affairs	1998
National Environmental Management: Biodiversity Act (Act 10)		Department of Environmental Affairs	2004
National Heritage Resources Act (Act 25)		National Heritage Resources Agency	1999
National Water Act (Act 36)		Department of Water and Sanitation	1998
National Guidelines			
EIA Guideline Series, in particular: • Guideline 5 – Companion to the NEMA EIA Regulations, 2010 (DEA, October 2012)	The WfWetlands Programme is a rehabilitation proposal that aims to protect and conserve South Africa's wetland ecosystems. As such the listed legislation, policies	Department of Environmental Affairs	2012 - 2014

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
• Guideline 7 – Public Participation in the EIA process, 2012 (DEA, October 2012) • Guideline 9 – Guideline on Need and Desirability, 2010 (DEA, October 2014)	and guidelines are all of relevance to the project.		
Provincial Bylaws, Frameworks, Plans and Policies			
Provincial Gazette for Limpopo No. 1333, Vol. 14 (GN 92 of 2007)	GN 92 of 2007 declares sites as provincial (Limpopo Province) heritage sites. As such the GN is of relevance to the project.	Limpopo Provincial Government Department of Sport, Arts and Culture	2007
Limpopo Conservation Plan Version 2	The WfWetlands Programme is a rehabilitation proposal that aims to protect and conserve South Africa's wetland ecosystems. As such the listed legislation, policies and guidelines are all of relevance to the project.	Limpopo Department of Economic Development, Environment & Tourism	2013
Limpopo Provincial Heritage regulations, No.103	The Limpopo Provincial Heritage Resources Authority (LIHRA) is responsible for the identification, conservation and management of heritage resources in the province.	Limpopo Heritage Resource Authority (LIHRA)	2003
International Conventions			
Convention on Biological Diversity	The WfWetlands Programme is a rehabilitation proposal that aims to protect and conserve South Africa's wetland ecosystems. As such the listed legislation, policies and guidelines are all of relevance to the project.		
New Partnership for Africa's Development (NEPAD)			
The Ramsar Convention			
The World Summit on Sustainable Development (WSSD)			
United Nations Conventions to Combat Desertification			

2.1.1 National Environmental Management Act, No. 107 of 1998 (NEMA)

The implementation of various interventions aimed at wetland rehabilitation require Environmental Authorisation (EA) from the Department of Environmental Affairs (DEA) in terms of Regulations pursuant to NEMA, as amended. It has been determined together with DEA that a **Basic Assessment Report (BAR)** will be prepared for each Province where work is proposed by the WfWetlands Programme In addition, **rehabilitation plans** have been prepared for each project area. The rehabilitation plans describe the combination and number of interventions selected to meet the rehabilitation objectives for each Wetland Project, as well as an indication of the approximate location and approximate dimensions of each intervention. **Appendix A** provides a description of the typical intervention types that are used for wetland rehabilitation purposes. The rehabilitation plans also provide site photographs of the general landscape as well as photographs of the proposed locations for each intervention.

The WfWetlands Programme is not a development proposal
It is important to note that the very objectives of the WfWetlands Programme are to **improve both environmental and social circumstances**. The WfWetlands Programme **gives effect to a range of policy objectives of environmental legislation**, and also **honours South Africa's commitments under several international agreements**, especially the Ramsar Convention on Wetlands. The legislation protecting the environment in South Africa was not written with the intention of preventing wetland rehabilitation efforts, but rather of curtailing development in sensitive environments. It is important to remember that **the WfWetlands Programme is not a development proposal,** and although this programme technically requires Environmental Authorisation in terms of Regulations pursuant to NEMA, such environmentally positive rehabilitation projects should not need to be assessed for negative environmental impact. Therefore, legislative processes aimed at preventing negative environmental impact through development are really not applicable to a project of this nature and the **project activities that trigger Listing Notices are only being undertaken to benefit the environment**.

2.1.1.1 Listed Activities

The following listed activities, as shown in **Table 5**, have been identified as being applicable to the proposed rehabilitation interventions:

Table 5: Listed activities triggered by the proposed Soutini-Baleni project

Listed activity	Description of project activity that triggers listed activity
Listing Notice 1 (GN R983, as amended)	
Activity 12: The development of- (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres in size; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- (a) within a watercourse; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	In order to achieve the objectives of wetland rehabilitation, changes must be made to artificial drainage lines or eroding water channels if the wetland system is to be returned to its original status. The following may be necessary: • The construction of concrete or gabion weirs within watercourses (wetlands); • The formalisation of stream crossings to ensure that the integrity of the wetland system downstream and upstream of the crossings are protected from further degradation; and

Listed activity	Description of project activity that triggers listed activity
	• The construction of walkways in public wetlands to limit human impact, and to form part of the educational component of the project.
Activity 19: The infilling or depositing of any material of more than 10 m^3 into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10m^3 from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving – (b) is for maintenance purposes undertaken in accordance with a maintenance management plan	In order to implement the proposed rehabilitation interventions, soil would need to be moved as part of the site preparation and/or construction activities, for example: • Excavations may be required to build weirs, etc.; • Erosion channels may be filled with rocks or soil; • Eroded embankments may need to be sloped for MacMat R to be applied, etc.
Listing Notice 3 (GN R985, as amended)	
Activity 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. Limpopo ii. Within critical biodiversity areas identified in bioregional plans;	In order for WfWetlands to achieve rehabilitation objectives, the removal of alien invasive species will be required. The wetland falls with a CBA 1 area
Activity 14: The development of- (i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs - (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse **e. Limpopo** i. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; or	In order to achieve the objectives of wetland rehabilitation, changes must be made to artificial drainage lines or eroding water channels if the wetland system is to be returned to its original status. The following may be necessary: • The construction of concrete or gabion weirs within watercourses (wetlands); • The formalisation of stream crossings to ensure that the integrity of wetland systems downstream and upstream of the crossings are protected from further degradation; and • The construction of walkways in public wetlands to limit human impact, and to form part of the educational component of the project. The wetland falls with a CBA 1 area and the Kruger National Park is about 1.5km from the wetland.

Listed activity	Description of project activity that triggers listed activity
(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;	

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

In terms of Section 39 of the NWA, a General Authorisation[3] (GA) has been granted for certain activities that usually require a Water Use License; as long as these activities are undertaken for wetland rehabilitation. These activities include '*impeding or diverting the flow of water in a watercourse*[4]' and '*altering the bed, banks, course or characteristics of a watercourse*[5]' where they are specifically undertaken for the purposes of rehabilitating[6] a wetland for conservation purposes. The WfWetlands Programme is required to register the 'water use' in terms of the GA.

2.1.3 National Heritage Resource Act, No. 25 of 1999 (NHRA)

Sections 27, 28 and 34 of the NHRA pertains to the protection of national and provincial heritage sites, protected areas, and structures older than 60 years, and prohibits any impacts to these resources. Section 38 of the NHRA requires that any person who intends to undertake a development as categorised in the NHRA must at the very earliest stages of initiating the development notify the responsible heritage resources authority, namely the South African Heritage Resources Agency (SAHRA) or the relevant provincial heritage agency. These agencies would in turn indicate whether or not a full Heritage Impact Assessment (HIA) would need to be undertaken.

The Soutini-Baleni wetland system included in this application, is a formally declared Natural Heritage site (General Notice 92 of 2007). It is a traditional Tsonga salt manufacturing site which provides valuable resources to the local communities and is considered culturally significant. A heritage specialist, Mr Stephen Gaigher of G&A Heritage, was thus appointed to undertake a Heritage Impact Assessment (**Appendix D**) to identify and assess potential impacts on heritage resources within the wetland system. The requirements of the NHRA are tabulated below, as well as an indication of their applicability to this project (refer **Table 6**).

Table 6: Applicability of NHRA requirements in terms of the proposed wetland rehabilitation activities

NHRA Section	Applicability to WfWetlands
Section 34: Preservation of buildings older than 60 years	No buildings older than 60 years occur within the wetland system.
Section 35: Archaeological, paleontological and meteor sites	Not applicable according to the heritage specialist.
Section 36: Graves and burial sites	Applicable due to a single grave site identified in the area adjacent to the wetland system.
Section 37: Protection of public monuments	Not applicable according to the heritage specialist.

[3]Government Notice No. 1198, 18 December 2009
[4]Section 21(c) of the NWA, No. 36 of 1998
[5]Section 21(i) of the NWA, No. 36 of 1998

NHRA Section	Applicability to WfWetlands
Section 38(1): Development categories	
(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;	A cattle fence has been proposed around the spring at Soutini-Baleni to protect it against trampling and overgrazing. This fence would exceed the 300m threshold.
(b) the construction of a bridge or similar structure exceeding 50m in length;	The typical wetland rehabilitation interventions used by WfWetlands do not meet the requirements of the definition of a bridge as adopted by the South African Institution of Civil Engineering[1]. Furthermore, even though some of the rehabilitation interventions (namely gabion and concrete weirs, see Appendix A) extend across former wetland areas, none of these structures would exceed the threshold of 50m in length. This listing is therefore not considered to be applicable to the WfWetlands Programme.
(c) any development or other activity which will change the character of a site - (i) exceeding 5 000m2 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;	The WfWetlands Programme aims toward restoration and involves wetland rehabilitation measures to restore the natural wetland system by addressing erosion problems and threats to ecological functioning (i.e. maintaining the natural character of the site). The Programme therefore does not constitute a development or an activity that will change the character of a site, but rather involves interventions to reclaim important natural systems at risk of being lost to anthropogenic impact. This Listing is therefore not considered to be applicable to the WfWetlands Programme.
(d) the re-zoning of a site exceeding 10 000m2 in extent; or	The WfWetlands Programme does not require that any of the project areas be rezoned. This Listing is therefore not considered to be applicable to the WfWetlands Programme.
(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,	The WfWetlands Programme does not constitute any other category of development provided for in regulations by SAHRA. It is a Government rehabilitation initiative. This Listing is therefore not considered to be applicable to the WfWetlands Programme.

[1] "A structure erected over a depression, river, watercourse, railway line, road or other obstacle for carrying motor, railway, pedestrian or other traffic or services and having a length of 6m or more, measured between and abutment faces along the centre line of the road at girder-bed level, expect that road-over-rail or rail-over-road structure are always classed as bridges." (COLTO, 1998).

3 METHODOLOGY

3.1 Approach to the Project

In order to manage the **WfWetlands Programme**, wetlands have been grouped into "projects", and each **Wetland Project** encompasses several smaller wetland systems which each are divided into smaller, more manageable and homogenous wetland units. These Wetland Projects may be located within one or more quaternary catchments within a Province.

Each Wetland Project is managed in three phases (as shown in the flow diagram in **Figure 3**) over a two-year cycle. The first two phases straddle the first year of the cycle and involve planning, identification, design and authorisation of interventions. The third phase is implementation, which takes place during the second year.

In order to undertake these three phases, a collaborative team has been established as follows. The **Programme Team** currently comprises two subdirectories: a) Implementation and After Care and b) Planning, Monitoring and Evaluation. The Assistant Directors for Wetlands Programmes (ASDs)[6] report to the Implementation and After Care Deputy Director and are responsible for the identification and implementation of projects in their regions. The Programme Team is further supported by a small team that fulfil various roles such as Geographical Information Systems (GIS) and training. Independent Design Engineers and Environmental Assessment Practitioners (EAPs) are appointed to undertake the planning, design and authorisation components of the project. The project team is assisted by a number of wetland specialists who provide scientific insight into the operation of wetlands and bring expert and often local knowledge to the project teams. They are also assisted by the landowners and implementers who have valuable local knowledge of these wetlands.

The first phase is the identification of suitable wetlands which require intervention. The purpose of Phase 1 and the associated reporting is to identify:

- Priority catchments and associated wetlands/ sites within which rehabilitation work needs to be undertaken; and
- Key stakeholders who will provide meaningful input into the planning phases and wetland selection processes, and who will review and comment on the rehabilitation proposals.

Phase 1 commences with a catchment and wetland prioritisation process for every province. The Wetland Specialist responsible for a specific province undertakes a desktop study to determine the most suitable wetlands for the WfWetlands rehabilitation efforts. The involvement of Provincial Wetland Forums[7] and other key stakeholders is a critical component of the wetland identification processes since these stakeholders are representative of diverse groups with shared interests (e.g. from government institutions to amateur ecological enthusiasts). This phase also involves initial communication with local landowners and other Interested and Affected Parties (I&APs) to gauge the social benefits of the work. Aerial surveys of the areas in question may be undertaken, as well as limited fieldwork investigations or site visits to confirm the inclusion of certain wetland projects or units. Once wetlands have been prioritised and agreed on by the various parties, specific rehabilitation objectives are determined for each wetland following a rapid wetland assessment undertaken by the Wetland Specialist.

[6] Also referred to as Provincial Coordinators (PCs).

[7] Where possible, the most recent provincial Wetland Forum minutes are included in Appendix E.

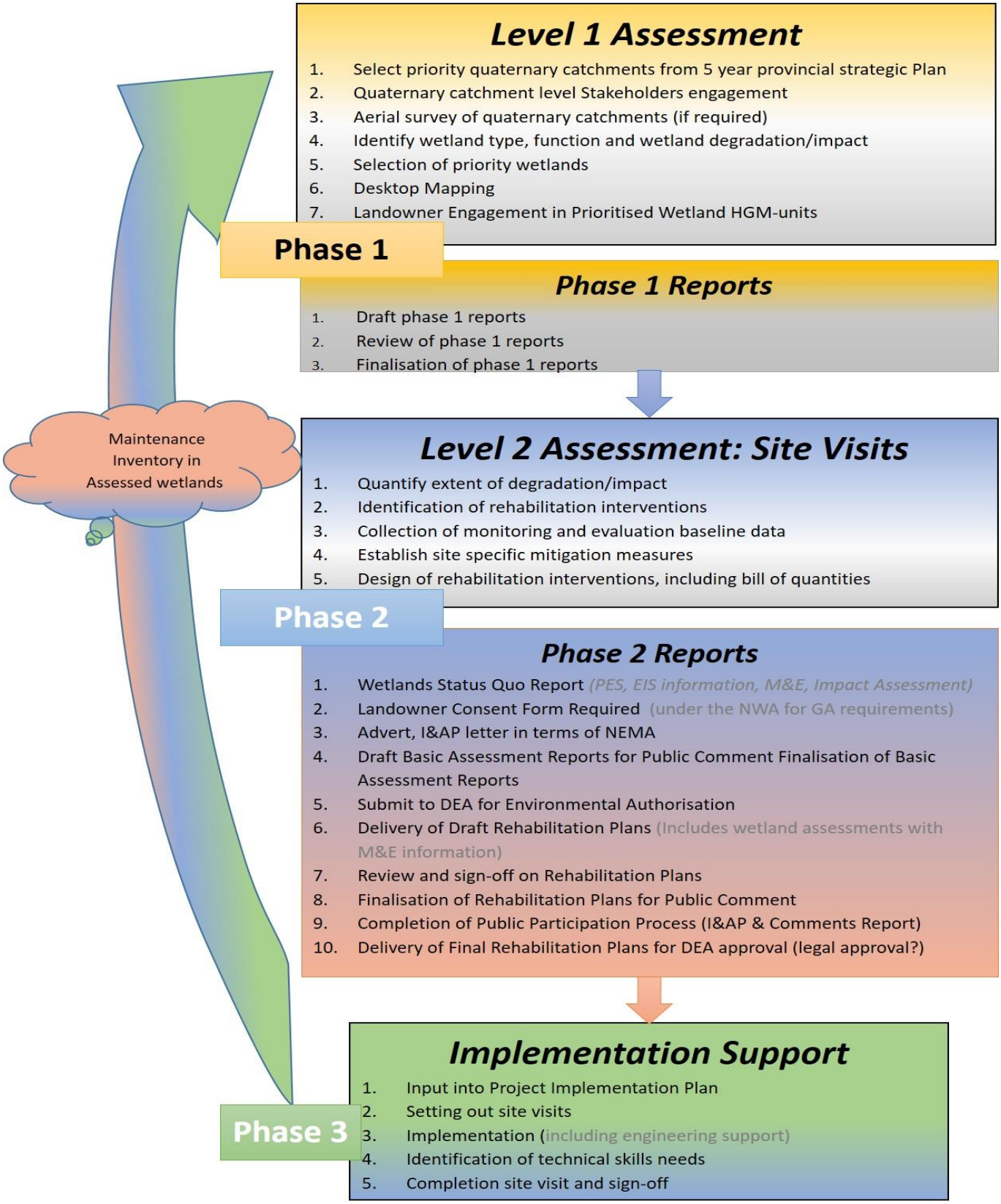


Figure 3: The Working for Wetlands planning process.

Phase 2 requires site visits attended by the fieldwork team comprising a Wetland Specialist, a Design Engineer, an EAP, and an ASD. Other interested stakeholders or authorities, landowners and in some instances the Implementing Agents (IAs) may also attend the site visits. This allows for a highly collaborative approach, as options are discussed by experts from different scientific disciplines, as well as local inhabitants with deep anecdotal knowledge. While on site, rehabilitation opportunities are investigated. The details of the proposed interventions are discussed, some survey work is undertaken by the engineers, and Global Positioning System (GPS) coordinates and digital photographs are taken for record purposes. Furthermore, appropriate dimensions of the locations are recorded in order to design and calculate quantities for the interventions. At the end of the site visit the rehabilitation objectives together with the location layout of the proposed interventions are agreed upon by the project team.

During Phase 2, monitoring systems are put in place to support the continuous evaluation of the interventions. The systems monitor both the environmental and social benefits of the interventions. As part of the Phase 2 site visit, a maintenance inventory of any existing interventions that are damaged and/or failing and thus requiring maintenance is compiled by the ASD, in consultation with the Design Engineer.

Based on certain criteria and data measurements (water volumes, flow rates, and soil types); the availability of materials such as rock; labour intensive targets; maintenance requirements etc., the interventions are then designed. Bills of quantity are calculated for the designs and cost estimates made. Maintenance requirements for existing interventions in the assessed wetlands are similarly detailed and the costs calculated. The Design Engineer also reviews and, if necessary, adjusts any previously planned interventions that are included into the historical rehabilitation plans.

Phase 2 also requires that Environmental Authorisations are obtained before work can commence in the wetlands during Phase 3. Provincial level BARs and project specific rehabilitation plans are prepared. The rehabilitation plans include details of each intervention to be implemented, preliminary construction drawings and all necessary documentation required by applicable legislation. The rehabilitation plans are considered to be the primary working document for the implementation of the project via the construction/ undertaking of interventions listed in the Plan.

Phase 3 commence upon approval of the BARs and wetland rehabilitation plans by DEA. The work detailed for the project would be implemented within a year followed by on-going monitoring. It is typically at this point in the process when the final construction drawings are issued to the Implementing Agents (IAs). Seventeen IAs are currently employed in the WfWetlands Programme and are responsible for employing contractors and their teams (workers) to construct the interventions detailed in each of the rehabilitation plans. For all interventions that are based on engineering designs (typically hard engineered interventions), the Design Engineer is required to visit the site before construction commences to ensure that the original design is still appropriate in the dynamic and ever-changing wetland system. The Design Engineer assist the IAs in pegging and setting-out interventions. Phase 3 concludes with the construction of the interventions, but there is an on-going monitoring and auditing process that ensures the quality of interventions, the rectification of any problems, and the feedback to the design team regarding lessons learnt.

Landowner consent is an important component of each phase in each Wetland Project. The flow diagram, **Figure 3**, demonstrates the point at which various consent forms must be approved via signature from the directly affected landowner. The ASDs are responsible for undertaking the necessary landowner engagement and for ensuring that the requisite landowner consent forms required as part of Phase 1 and 2 of this project are signed. Without these signed consent forms the WfWetlands Programme will not be able to implement rehabilitation interventions on the affected property.

3.2 Impact Assessment Methodology

This section outlines the proposed method for assessing the significance of the potential environmental impacts during the construction and operational phase.

For each impact, the **EXTENT** (spatial scale), **MAGNITUDE** and **DURATION** (time scale) is described. These criteria were used to ascertain the **SIGNIFICANCE** of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The mitigation described in the BAR represents the full range of plausible and pragmatic measures but does not necessarily imply that they will be implemented.

The tables on the following pages show the scale used to assess these variables and defines each of the rating categories.

Table 7: Assessment criteria for the evaluation of impacts

Criteria	Category	Description
Spatial influence of impact	**Regional**	Beyond a 10 km radius of the candidate site.
	Local	Between 100 m and 10 km radius of the candidate site.
	Site specific	On site or within 100 m of the candidate site.
Magnitude of impact (at the indicated spatial scale)	**High**	Natural and/ or social functions and/ or processes are *severely* altered
	Medium	Natural and/ or social functions and/ or processes are *notably* altered
	Low	Natural and/ or social functions and/ or processes are *slightly* altered
	Very Low	Natural and/ or social functions and/ or processes are *negligibly* altered
	Zero	Natural and/ or social functions and/ or processes remain *unaltered*
Duration of impact (temporal)	**Construction period**	From commencement up to 2 years after construction
	Short Term	From 2 to 5 years after construction
	Medium Term	From 5 to 15 years after construction
	Long Term	More than 15 years after construction

The **SIGNIFICANCE** of an impact is derived by taking into account the temporal and spatial scales and magnitude. The means of arriving at the different significance ratings is explained in **Table 8**.

Table 8: Definition of significance ratings

Significance ratings	Level of criteria required
High	• High magnitude with a regional extent and long term duration • High magnitude with either a regional extent and medium term duration or a local extent and long term duration • Medium magnitude with a regional extent and long term duration
Medium	• High magnitude with a local extent and medium term duration • High magnitude with a regional extent and construction period or a site specific extent and long term duration • High magnitude with either a local extent and construction period duration or a site specific extent and medium term duration • Medium magnitude with any combination of extent and duration except site specific and construction period or regional and long term • Low magnitude with a regional extent and long term duration
Low	• High magnitude with a site specific extent and construction period duration • Medium magnitude with a site specific extent and construction period duration • Low magnitude with any combination of extent and duration except site specific and construction period or regional and long term • Very low magnitude with a regional extent and long term duration
Very low	• Low magnitude with a site specific extent and construction period duration • Very low magnitude with any combination of extent and construction or short term duration
Neutral	• Zero magnitude with any combination of extent and duration

Once the significance of an impact has been determined, the **PROBABILITY** of this impact occurring as well as the **CONFIDENCE** in the assessment of the impact, was determined using the rating systems outlined in **Table 9** and **Table 10**, respectively. It is important to note that the significance of an impact should always be considered in connection with the probability of that impact occurring. Lastly, the **REVERSIBILITY** of the impact is estimated using the rating system outlined in **Table 11**.

Table 9: Definition of probability ratings

Probability ratings	Criteria
Definite	Estimated greater than 95 % chance of the impact occurring.
Probable	Estimated 5 to 95 % chance of the impact occurring.
Unlikely	Estimated less than 5 % chance of the impact occurring.

Table 10: Definition of confidence ratings

Confidence ratings	Criteria
Certain	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.
Sure	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.
Unsure	Limited useful information on and understanding of the environmental factors potentially influencing this impact.

Table 11: Definition of reversibility ratings

Reversibility ratings	Criteria
Irreversible	The activity will lead to an impact that is in all practical terms permanent.
Reversible	The impact is reversible within 2 years after the cause or stress is removed.

3.3 Assumptions and Limitations

3.3.1 Assumptions

In undertaking this investigation and compiling the BAR, the following have been assumed:

- The strategic level investigations undertaken during Phase 1 are acceptable and robust.
- The information provided by the applicant and specialists is accurate.
- The scope of this investigation is limited to assessing the over-all environmental impacts that have been identified over time since the WfWetlands Programme commenced in the early 2000's. Additional site specific impacts/ mitigation measures, focusing on the Wetland Unit and proposed intervention, was identified during the planning phase and are included in the applicable rehabilitation plan.

4 PUBLIC PARTICIPATION PROCESS

South African legislation and guidelines have formalised stakeholder engagement in the BAR process and refer to it as the Public Participation Process (PPP). PPP forms an integral component of the environmental impact assessment process and enables I&APs to identify issues, concerns, and suggestion through the review of documents/ reports at various stages throughout the BAR process as described in Chapter 6 of GN R982, as amended. For more detail on the PPP undertaken to date (e.g. copies of advertisements, poster locations, comments received, etc.), please refer to **Appendix B**.

Table 12: Public Participation Process

Activity	Description
Pre-application	
Advertisements	Adverts were placed in the *Capricorn Voice* to allow I&APs the opportunity to register their interest in the project.
Site Posters	Posters, notifying I&APs of the proposed rehabilitation projects, were placed at the entrance to the Park and at the local library.
Register of I&APs	The existing provincial I&AP database (from previous planning cycles) has been updated with information from new I&APs responding to advertisements and site notices throughout the application process. Proactive identification of I&APs, municipal representatives, organs of state, competent authorities and surrounding landowners were also undertaken to update the database specific to the new planning year.
Basic Assessment Process	
Availability of BAR for public comment	The BAR were made available for a 30 day comment period from 14 October 2019 to 12 November 2019 on Aurecon's website: http://aurecongroup.com/en/public-participation.aspx. Relevant commenting authorities received an electronic copy (i.e. CD) of the BAR and Rehabilitation Plans to review and comment on. Registered I&APs were able to contact Mr Simamkele Ntsengwane if they had problems accessing the documents. Mr Simamkele Ntsengwane can be contacted at Tel: 021 526 9560 and/or Email: Simamkele.Ntsengwane@aurecongroup.com.
Written Notification	Written notification was given on 11 October 2019 to all registered I&APs regarding the availability of the BAR and on 7 June 2019 regarding the availability of the BAR and rehabilitation plans for public comment.
Register of I&APs	The register for I&APs will continue to be updated during the Basic Assessment Process.
Comments	All comments received during the first application process is included in a Comments and Response Report (CRR) (available in Appendix B5), with copies of the original comments received.

Following the 30 day public comment period, the BAR and rehabilitation plans will be updated by incorporating any additional I&AP comments received on the reports (where relevant). All comments will be recorded and responded to in a second CRR which will be circulated to all who have provided comment. The updated BAR and rehabilitation plans will then be submitted to DEA for their decision-making process. Once DEA has made their decision on the proposed project, all registered I&APs will be notified of the outcome of the decision within fourteen (14) calendar days of the decision and the right to appeal projects.

5 PROJECT DESCRIPTION

5.1 Need and Desirability: National Importance of the WfWetlands Programme

South Africa is a dry country but is endowed with exceptionally rich biodiversity. The nation has a pressing reason to value the water-related services that wetlands provide. It is estimated that by 2025, South Africa will be one of fourteen African countries classified as "*subject to water scarcity*" (UNESCO, 2000). The conservation of wetlands is fundamental to the sustainable management of water quality and quantity, and wetland rehabilitation is therefore essential to conserving water resources in South Africa.

The guiding principles of the NWA recognise the need to protect water resources. In responding to the challenge of stemming the loss of wetlands and maintaining and enhancing the benefits they provide, government has recognised that, in order to be truly effective, strategies for wetland conservation need to include a combination of proactive measures for maintaining healthy wetlands, together with interventions for rehabilitating those that have been degraded. These objectives are currently being expressed in a coordinated and innovative way through the WfWetlands Programme.

Working for Wetlands pursues its mandate of wetland protection, wise use and rehabilitation in a manner that maximises employment creation, supports small emerging businesses, and transfers skills amongst **vulnerable** and **marginalised** groups. In the 15 years since 2004, the WfWetlands Programme has invested just under R1.1 billion in wetland rehabilitation and has been involved in over 1 500 wetlands, thereby improving or securing the health of over 70 000 hectares of wetland environment. The WfWetlands Programme has a current budget of just over R 130 million, of which approximately 35% is allocated directly to paying wages. Being part of the EPWP, the WfWetlands Programme has created more than 34 000 jobs and over 3.2 million person-days of paid work. The local teams are made up of a minimum of 55% women, 65% youth and 2% disabled persons.

Wetlands are not easy ecosystems to map at a broad scale as they are numerous, often small and difficult to recognise and delineate on remotely sensed imagery such as satellite photos. The WfWetlands Programme houses the National Wetlands Inventory Project (NWI) which aims to provide clarity on the extent, distribution and condition of South Africa's wetlands. The project clarifies how many and which rivers and wetlands have to be maintained in a natural condition to sustain economic and social development, while still conserving South Africa's freshwater biodiversity.

The National Freshwater Ecosystem Priority Areas (NFEPA) has used the NWI data to produce the most comprehensive national wetland map to date, called the NFEPA Atlas. This atlas enables the planning of wetland rehabilitation on a catchment scale.

Other activities that form part of the WfWetlands Programme include:

- Raising awareness of wetlands among workers, landowners and the general public; and
- Providing adult basic education and training, and technical skills transfer (in line with the emphasis of the EPWP on training, the WfWetlands Programme has provided 250 000 days of training in vocation and life skills).

5.2 Activities to be undertaken

The successful rehabilitation of a wetland requires that the cause of damage or degradation is addressed, and that the natural flow patterns of the wetland system are re-established (flow is encouraged to disperse rather than to concentrate). Approximately 800 interventions are implemented every year in the WfWetlands Programme. Examples of typical interventions are provided in detail in **Appendix A.** The following points provide a summary of the objectives, and activities.

The key objectives of implementing interventions include:

- Restoration of hydrological integrity (e.g. raising the general water table or redistributing the water across the wetland area);
- Recreation of wetland habitat towards the conservation of biodiversity; and
- Job creation and social upliftment.

Typical activities undertaken within the projects include:

- Plugging artificial drainage channels created by development or historical agricultural practices to drain wetland areas for other land use purposes;
- Constructing structures (gabions, berms, weirs) to divert or redistribute water to more natural flow paths, or to prevent erosion by unnatural flow rates that have resulted from unsustainable land use practices or development; and
- Removing invasive alien or undesirable plant species from wetlands and their immediate catchments (in conjunction with the Working for Water initiative).

Methods of wetland rehabilitation may include hard engineering interventions (see Section 5.3 and **Appendix A)** such as:

- Earth berms or gabion systems to block artificial channels that drain water from or divert polluted water to the wetland;
- Concrete and gabion weirs to act as settling ponds, to reduce flow velocity or to re-disperse water across former wetland areas thereby re-establishing natural flow paths;
- Earth or gabion structure plugs to raise channel floors and reduce water velocity;
- Concrete or gabion structures to stabilise head-cut or other erosion and prevent gullies;
- Concrete and/or reno mattress strips as road crossings to address channels and erosion in wetlands from vehicles; and
- Gabion structures (mattresses, blankets or baskets) to provide a platform for the growth of desired wetland vegetation.

Soft engineering interventions (see Section 5.3 and **Appendix A)** also offer successful rehabilitation methods, and the following are often used together with the hard engineering interventions:

- The use of biodegradable or natural soil retention systems such as eco-logs, MacMat-R plant plugs, grass or hay bales, and brush-packing techniques;
- The re-vegetation of stabilised areas with appropriate wetland and riparian plant species;
- Alien invasive plant clearing, which is an important part of wetland rehabilitation (this is supported by the Working for Water Programme).
- The fencing off of sensitive areas within the wetland to keep grazers out and to allow for the re-establishment of vegetation;
- In some instances, the use of appropriate fire management and burning regimes. The removal of undesirable plant and animal species; and
- In some wetlands, it may be possible to involve the community to develop a management plan for wise use within a wetland. This can involve capacity building through educating and training the community members who would monitor the progress. A plan could involve measures such as rotational grazing with long term benefits for rangeland quality.

5.3 Alternatives

"Alternatives", in relation to a proposed activity, refers to different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

a) the property on which or location where it is proposed to undertake the activity;
b) the type of activity to be undertaken;
c) the design or layout of the activity;
d) the technology to be used in the activity;
e) the operational aspects of the activity; and
f) the option of not implementing the activity.

Due to the WfWetlands Programme not being a development proposal, the use of alternatives as normally applied in terms of the NEMA is not appropriate. As explained earlier in Chapter 3, a comprehensive phased approached is applied each year to identify wetlands with a high rehabilitation priority (Phase 1), rehabilitation objectives for each wetland unit and the most appropriate interventions to achieve these objectives (Phase 2). During Phase 3, these interventions are again scrutinised during setting-out to consider changes that have occurred within the landscape since the original planning took place. Should any significant changes be required to the intervention, the Project Team will be informed by the engineer to ensure that the proposed design changes would not compromise the rehabilitation objectives identified for the specific wetland. For more information on how alternatives are being considered for the WfWetlands Programme, please refer to **Table 13**.

Table 13: Approach to alternatives for the WfWetlands Programme

Alternative	Applicability to WfWetlands
Site Alternatives	All quaternary catchments within the province are considered for possible wetland rehabilitation work in the earlier stages of the WfWetlands Programme (Phase 1 catchment and wetland prioritisation processes), and only those that meet the prioritisation criteria are selected for the current planning cycle. Wetlands within the selected Quaternary Catchments undergo a similar prioritisation process, which includes a consultation component with the relevant stakeholders and interest groups, and the Wetland Projects presented in this report are those that are finally selected. Wetland Units within each Wetland Project are investigated by the Wetland Specialist and these are selected based on their suitability in terms of the overall WfWetlands Programme objectives[8]. The earlier site selection processes to determine feasible and reasonable Wetland Projects are described in detail in Section 3.1. **All wetland site alternatives have therefore already been considered in the earlier phases of the WfWetlands Programme, and only the preferred wetland systems (site locations) are presented here.** For the purpose of this report, no feasible or reasonable wetland site alternatives exist.
Other Alternatives	One form of alternative considered during the WfWetlands Programme is a design alternative, where all possible intervention options that may achieve a desired rehabilitation objective are contemplated during the Phase 2 field work component of a particular Wetland Unit. The design team comprising a Wetland Specialist, a Design Engineer, an EAP, and an ASD (and in some instances other interested stakeholders such as authorities and/or landowners who may attend the site visit) will discuss and select the most appropriate intervention option for a particular problem. **Each of the intervention options selected, as well as the determination of the most appropriate location for these within the Wetland Unit are therefore based on expert opinion and are thus considered to be the most suitable and effective interventions to achieve the rehabilitation objectives for the wetland.**

[8] Wetland conservation and poverty reduction through job creation and skills development amongst vulnerable and marginalised groups.

Alternative	Applicability to WfWetlands
No-Go Alternative	If the no-go alternative is pursued, the prioritised wetland will continue to deteriorate, resulting in an overall negative impact on aquatic and terrestrial ecosystems, habitats and species of conservation significance. **In the absence of rehabilitation, the important role of the wetland in flood attenuation, nutrient retention and water quality amelioration, as well as ecological services will not be realised.** In many instances the current degradation results in severe erosion, which may impact on the agricultural or land use potential of adjacent sites, as well as result in sedimentation and eutrophication impacts for downstream users.

6 BASELINE DESCRIPTION OF THE PROJECT

6.1 Limpopo Project: Background

WfWetlands has been rehabilitating wetlands in the Limpopo province for over ten years. The Soutini-Baleni project focusses on wetlands within the B82G catchment and was identified as a new project during the 2018/2019 planning cycle. The study area is situated south-west of Giyani, near Baleni Camp. It falls under the Mopani District Municipality, Greater Tzaneen Local Municipality, Limpopo Province. The land has a fairly high concentration of relatively large wetlands between Letsitele and Thabina River in the south west of the catchment, (Visioning the future of the Letaba catchment – the 12 Integrated Units of Analysis (IUAs) in perspective, 2018 [online]). The wetland is located in the upper reaches of the catchment on the Pietersburg plateau and Lowveld hydrogeological region where slopes are gentle, and rainfall is higher, (The South African State of Rivers Report: Letaba and Luvuvhu Rivers, 2018 [online]). The most culturally and geo-hydrologically interesting systems that occur in the catchment are the two thermal spring systems one at Eiland (Hans Merensky Nature Reserve) and the other (Soutini-Baleni) close to the banks of Klein Letaba River in its middle reaches (DWAFF, 2006 [Figure 5.1]). This wetland is particularly culturally significant and is thought to be one of the few remaining undeveloped hot springs in South Africa where traditional Tsonga salt making activities take place (See Figures 4-6), (Provincial Gazette for Limpopo No. 1333, 2007).

6.2 Biophysical Environment

The table below provides an overview of the biophysical environment of the Soutini-Baleni wetland system and quaternary catchment B82G.

Please refer to **Appendix C** for a selection of maps that show the location and biodiversity sensitivity of the above wetland system.

6.2.1 Quaternary catchment B82G

Quaternary Catchment B82G	
General description	Quaternary catchment B83G is located east of Giyani, Limpopo Province and falls within the Levuvhu and Letaba water management area (WMA). (SANBI BGIS, 2018)
Climate	The climate of the area is typical of the Savanna biome. There is little rainfall throughout the year. It is a summer rainfall area with very dry winters and is generally frost-free, although frost sometimes occurs in the low-lying areas. The mean monthly minimum and maximum temperatures are 9˚C and 32.1˚C in June and January, while the annual average is 22.2˚C; and the mean annual precipitation is 527mm, (Soutini-Baleni Phase 2: Wetland Status Quo Report, 2017).
Geology and topography	The area is largely underlain by leucocratic biotite granite of vaalian age and sparse portions of grey biotite gneiss and migmatite of the goudplaats gneiss, (Soutini Baleni Phase 2: Wetland Status Quo Report, 2017). The quaternary catchment is characterised by red soils with high base status. The soils are classed as freely drained, structureless soils. The thermal spring system occurs in the Pietersburg plateau and lowveld hydrogeological region, (SANBI BGIS, 2018).
Terrestrial ecology	The quaternary catchment falls within the Savanna Biome and is characterised by the Lowveld Rugged Mopaneveld vegetation type which is not listed as a threatened ecosystem (SANBI BGIS, 2018).
Aquatic ecology	According to the 2014 PES for South African rivers, the Klein Letaba River has a PES of 'D', indicating that the system has been largely modified due to a large loss of natural habitat, biota and basic ecosystem functions (Soutini-Baleni Phase 2: Wetland Status Quo Report, 2017).

Land use	The main land uses in the quaternary catchment consist of subsistence farming.
Soutini-Baleni Wetland System	
Location	The wetland system is on the southern bank of the Klein Letaba River, approximately 40 km south-east of Giyani in Limpopo, on land belonging to the Mahumani Traditional Authority. (GN 92 of 2007).
District and Local municipality	Mopani District Municipality Greater Tzaneen Local Municipality
Reason for selection	The Soutini-Baleni wetland system was brought to the attention of WfWetlands by Hosi Mahumani. Upon investigation, it was determined that the wetland system consists of multiple warm water mires (i.e. thermal springs), which are globally recognised as rare. These mires are currently under threat from erosion and overgrazing and the decision was made by the Working for Wetlands management team to include the Soutini-Baleni wetland system in the 2018-19 planning phase to rehabilitate and protect this unique system.
Wetland type and size	The Soutini-Baleni wetland system consists of 12 mires that are fed by warm water (up to 34ºC) and can also be referred to as thermal springs. Peat domes have formed over the spring "eye" and has a thickness of 0.3 – 1.2m (see photos below). These mires are globally rare and there is an estimate of 50 thermal springs in South Africa, some with organic deposits. Besides the mires, a valley bottom wetland is situated adjacent to the larger mire and drains into an ephemeral stream which transects the study area. This ephemeral stream has significant bank erosion problems (Linström, 2019).  
Conservation status (terrestrial and aquatic)	The wetland falls within a type 1 Critical Biodiversity Area due to the site being located within 1km of the Klein Letaba River, its functionality as a river connectivity corridor and the habitat type (i.e. Lowveld Rugged Mopaneveld). The area is also listed as an EBA1 area, indicating its importance with regards to climate change resilience. (SANBI BGIS, 2018) The closest protected area to the wetland is the Kruger National Park, which is approximately 1.5 km east from the wetland.
Land use	The main land use within the wetland systems is salt-mining, tourism and grazing.

Wetland problems	The wetland's catchment has been impacted and changed due to overgrazing and trampling. Bare surfaces have formed and are contributing to sedimentation in the wetland area. Cattle tracks, a road crossing and donga erosion (head-cut erosion), etc. has also affected the hydrology, geomorphology and vegetation of the area (see photos below).  
Rehabilitation objectives	During Phase 2 planning, interventions would be identified to achieve the following rehabilitation objectives: • Re-instatement of more natural water distribution and retention patterns that would improve the overall functioning of the wetland and associated habitat for important wetland-dependant biota; • Raising of the water table to rehydrate areas adjacent to drainage channels; and • Promote habitat integrity.

6.3 Cultural and Heritage Environment[9]

The mire is culturally significant due to its mythical character and is a traditional Tsonga salt manufacturing site on the bank of the Klein Letaba River which provides valuable resources to the local communities.

Salt is mainly mined during the dry season, usually starting in May after consulting the ancestral spirits. The mining activity commences with the construction of filters that are made from mopane (*Colophospermum mopane*) branches and bark. A sieve is constructed with supple mopane rods and dry grass between four forked poles. The sieve is filled with clay from an anthill to form a cone shape with only a small hole (usually covered with grass or leaves) left in the middle for water to drip through (Figure 4).

Figure 4: Filters constructed from mopane branches and bark.

[9] The information contained in this section is based on the HIA compiled by Mr Stephan Gaigher of G&A Heritage. Please refer to Appendix D for a copy of the HIA.

Soil is collected at the edge of the wetland and taken back to the camp where it is mixed with an equal amount of river sand to improve filtration. This mixture is placed in the filters before water from the river is poured over it. The leached water is captured in a container that is placed beneath the cone opening (Figure 5).

Figure 5: Soil collected from the wetland's edge is mixed with river sand before being placed in the filters.

The filtered water is then boiled slowly over a fire to evaporate the water and allow the salt to crystallise (Figure 6). Finally, the damp salt is collected and placed on a flat surface in a cone shape to dry completely. According to archaeologists, the salt collectors may sometimes place coals on the cone to form a hard crust, place it on dry grass which is then burnt or placed in the sun to dry before baking it in a clay pot in the fire.

Figure 6: After the filtered water has been boiled, the salt crystals are collected and dried for future use.

The heritage specialists also found several concentrations of potshards and ash around the wetland as well as the remains of an old hut (Figure 7). The hut remains is located next to a large donga that is threatening the site. It is believed that this site was occupied during the early first millennium.

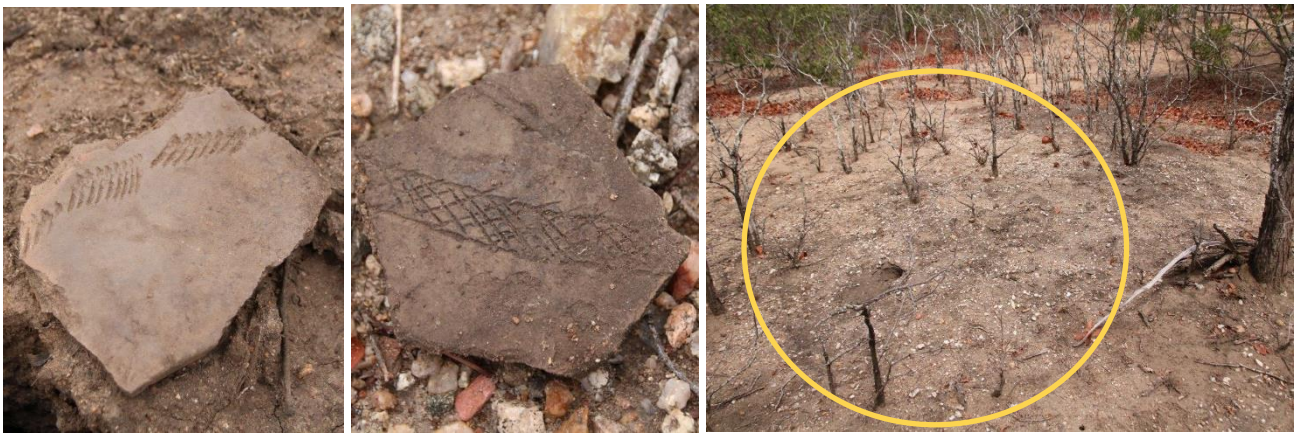


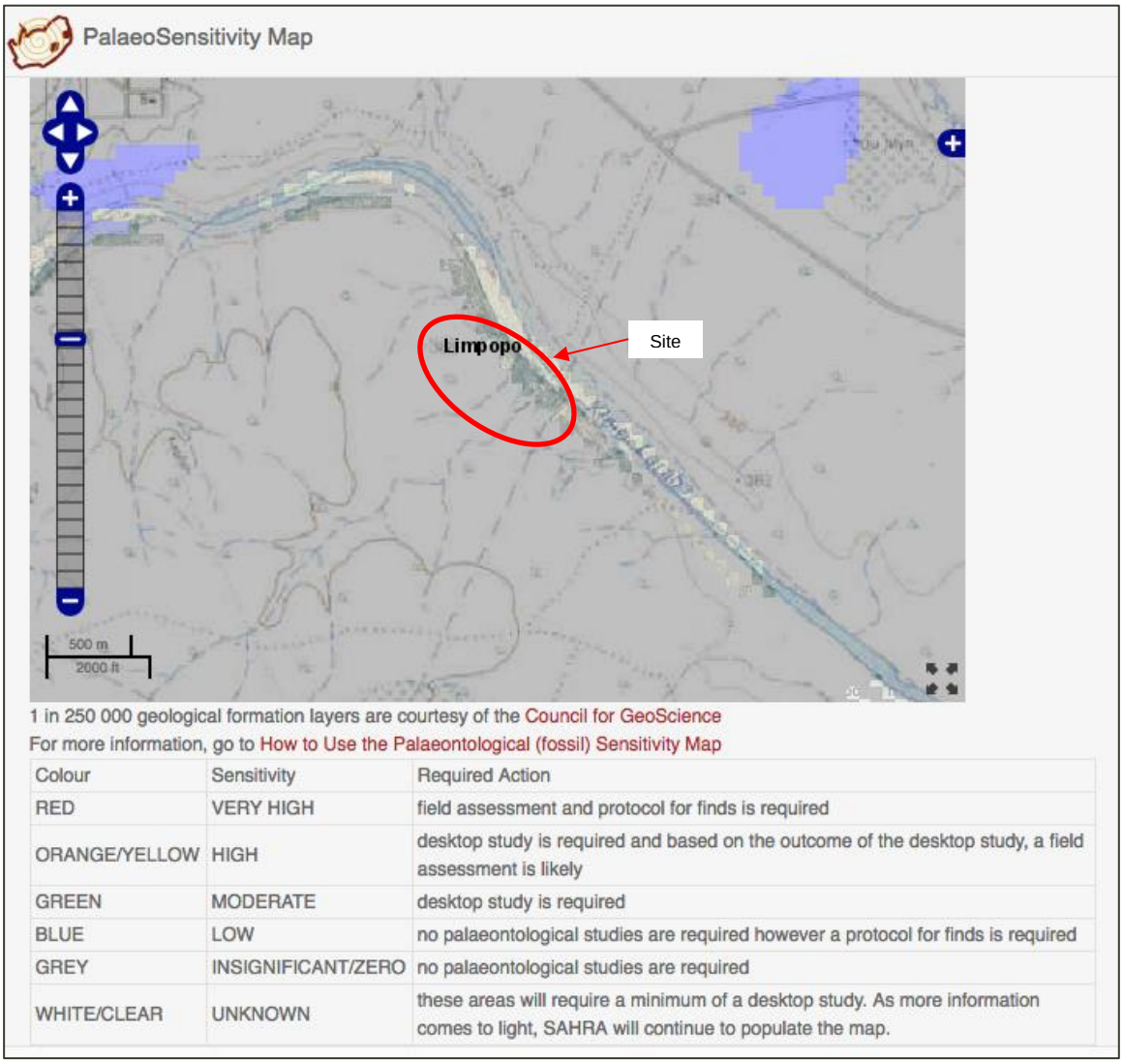
Figure 7: Pot shards where found at several locations around the wetland, as well as the remains of an old hut (indicated by the yellow circle).

Figure 8: Pot shards where found on the edge of the donga that is eroding close to the site.

A grave marker was also identified in the area adjacent to one of the wetlands. The writing on the marker was unfortunately too faded to determine names and dates.

Figure 9: Grave marker located more than 30m away from the Soutini-Baleni wetland system boundary.

With regards to palaeontological resources, the site is located in an area that is not considered sensitive by the South African Heritage Resource Agency (Figure 10).



Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 10: Palaeontological sensitivity map of the site – note that the entire area is grey due to an insignificant/zero sensitivity rating by SAHRA (Gaigher, 2019).

6.4 Socio-economic Environment

Table 14 below provides a summary of the socio-economic profile of the local municipalities within which the proposed wetland rehabilitation projects will take place. Being part of the EPWP, the WfWetlands Programme has created more than 34 000 jobs and over 3.2 million person-days of paid work by using local SMMEs to implement the approved wetland rehabilitation plans. Local teams generally consist of a minimum of 65% women, 55% youth and 2% disabled persons.

The EPWP focus on local unemployed people with the intent of making them part of the productive economic sector, assist with skills development and increase their capacity to earn an income. In terms of basic education and training of adults and skills transfer, the WfWetlands Programme has provided 250 000 days of training in vocation and life skills.

Table 14: Economic profile of the Greater Giyani Municipality

Population	
Young (0-14)	36,8%
Working age (15-64)	57,4%

Elderly (65+)	5,8%
Dependency ratio	74,2
Level of education (aged 20+)	
No schooling	25%
Higher education	7,1%
Matric	20,7%
Level of Employment (%)	
Unemployment rate	47%
Youth Unemployment rate	61,2%
Economic Profile (annual)	
No income	15,7%
R1 - R4,800	9,6%
R4,801 - R9,600	17,1%
R9,601 - R19,600	21,8%
R19,601 - R38,200	18,7%
R38,201 - R76,4000	7,2%
R76,401 - R153,800	4,3%
R153,801 - R307,600	3,3%
R307,601 - R614,400	1.6%
R614,001 - R1,228,800	0,3%
R1,228,801 - R2,457,600	0,1%
R2,457,601+	0,1%

Source: http://www.statssa.gov.za/?page_id=993&id=greater-giyani-municipality

The anticipated benefit of the WfWetlands Programme nationally is presented below in **Table 15.**

Table 15: Socio-economic value of the national WfWetlands Programme

Aspect	Response
What is the expected capital value of the activity on completion?	R 130 000 000
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	~ 120[10]
What is the expected value of the employment opportunities during the development and construction phase?	~R54.4 million in wages
What percentage of this will accrue to previously disadvantaged individuals?	~70%

[10] Employment opportunities are created only during the construction phase and for many of the projects there are already EPWP teams (team size averages around 20-35 individuals) working on them. However, Working for Wetland principles ensure that a very large percentage of those employed are from local communities.

7 IMPACT ASSESSMENT

The WfWetlands Programme has been rehabilitating wetlands across South Africa since the early 2000s and the teams are considered to be specialists when it comes to working in sensitive wetland environments. Their significant experience and knowledge is actively being transferred to Implementing Agents and Contractors not only verbally by the provincial ASDs, but also through training and the use of important tools such as the Environmental Management Programme (EMPr). It must be noted that the EMPr (**Appendix E**) is considered a living document and is updated on a regular basis to incorporate lessons learned and/or in response to changing environments (legal, biological, etc.). In addition, the requirements of the EMPr are supplemented with site specific mitigation measures, included in the relevant rehabilitation plan, as identified by the wetland specialist and EAP during the Phase 2 planning site visits.

This chapter focuses on the key potential impacts (direct, indirect and cumulative) that have been identified for the WfWetlands Programme over time. For each impact assessed, mitigation measures have been proposed to reduce and/or avoid negative impacts and enhance positive impacts. These mitigation measures are also incorporated into the EMPr to ensure that they are implemented during the planning/pre-construction, construction and operational phases. The EMPr forms part of the BAR (**Appendix E**), and as such its implementation will become a binding requirement should environmental authorisation be received from DEA.

The following subsections assess each impact according to the construction and operational phase in which they are likely to occur. It should be highlighted that this assessment does not consider the decommissioning of the proposed interventions. The purpose of the implementation of a specific intervention is to rehabilitate the affected wetland system and prevent further degradation. Furthermore, many of the soft interventions are made from biodegradable materials (see **Appendix A**). If these begin to degrade, they will not have a negative impact on the system. The hard interventions serve as a more permanent feature within the wetland, as the sensitive environments (which includes dispersive soils in some of them, for example) could be negatively impacted by new soil disturbance activities when removing interventions. Maintenance surveys are undertaken by WfWetlands and if a hard structure should begin to lose its function/ require maintenance, the intervention would be reconsidered either for maintenance, or the need to redesign the structure in response to landscape changes.

Please note that no roads will be constructed to provide access to wetlands for rehabilitation purposes. Only existing roads will be used.

7.1 CONSTRUCTION PHASE

7.1.1 Job creation

Phase	Pre-Construction	Construction	Operational	Decommissioning
Impact description	One of the primary objectives of the WfWetlands Programme is to create jobs and to teach transferrable skills to unemployed members of the local community so that they can be drawn into the permanent job market. The potential impact of this is significant and has a number of indirect positive impacts such as improvement in quality of life of the workers, increased spending in the local economy and the support of small business in the local area. Cumulatively, the impact of the WfWetlands projects is judged to be of high positive significance. The programme has a budget of just over R130 million per annum, has created in the region of 34 000 jobs and transferred skills to numerous previously unskilled persons. Should the project not be authorised or implemented, the potential jobs would not be created. Where projects already have active teams implementing interventions, this would have a high negative impact as the contractors would not be able to keep their teams busy. Where projects do not have			

	active teams, the impact would however be neutral as the impact would not be worse against the baseline, i.e. jobs would not be taken away, they just would not be created.		
	Pre-Mitigation	**Post-Mitigation**	**No-go Alternative**
Type	Positive	Positive	Negative
Extent	Site Specific	Site Specific	Site Specific
Magnitude	Medium	Low	High
			Zero
Duration	Long-term	Long-term	Long-term
Significance	**MEDIUM (+)**	**HIGH (+)**	**High (-)**
			Neutral
Probability	Definite	Definite	Definite
Confidence	Certain	Certain	Certain
Reversibility	Irreversible	Irreversible	Irreversible
Mitigation measures			
○ Ensure that the required project workers are sourced from local communities and that maximum employment numbers are maintained throughout the project duration. ○ Project implementers to support local businesses (e.g. local quarry owners to obtain rock for gabions) where possible.			

7.1.2 Fire risk

Phase	Pre-Construction	**Construction**	Operational	Decommissioning
Impact description	Construction usually takes place in the dry months when the danger of veld fires is highest. There is a possibility that construction workers could light a fire on site that could become out of control. The risk of this happening is assessed to be low, although the significance in terms of the economic damage that could be caused (especially in a commercial forestry area) is high. Adequate site supervision would considerably mitigate this impact. Fires are part of a natural biophysical cycle in most ecosystems and are therefore likely to still occur without the construction activities of the WfWetlands construction teams taking place.			
	Pre-Mitigation	**Post-Mitigation**	**No-go Alternative**	
Type	Negative	Negative	Negative	
Extent	Site Specific	Site Specific	Site Specific	
Magnitude	Medium	Low	Low	
Duration	Short-term	Short-term	Short-term	
Significance	**MEDIUM (-)**	**LOW (-)**	**LOW (-)**	
Probability	Unlikely	Unlikely	Likely	
Confidence	Sure	Sure	Sure	
Reversibility	Irreversible	Irreversible	Irreversible	
Mitigation measures				
○ Ensure that workers are aware of the potential for fires and the damage that could be caused. ○ Ensure that a fire response procedure is in place and that all dry season work is organized in liaison with the landowners so that it fits into their firebreak/fire protection programme.				

7.1.3 Nuisance impacts

Phase	Pre-Construction	Construction	Operational	Decommissioning
Impact description	Construction can result in nuisance impacts, particularly for landowners. These impacts include: • Noise from construction activities, personnel and vehicles. • An increase in the amount of litter being generated. • Dust. • Security concerns such as theft or leaving gates open. • Non-use of sanitation facilities. • Temporary loss of access to areas due to construction activities. Given the isolated working environment (i.e. far from communities and public routes), the relatively few number of people on site and constant supervision by the project implementer, the above impacts are likely to be of low magnitude. Should the project not be authorised or implemented, no nuisance impacts would occur.			

	Pre-Mitigation	Post-Mitigation	No-go Alternative
Type	Negative	Negative	Neutral
Extent	Site Specific	Site Specific	Site Specific
Magnitude	Medium	Low	Zero
Duration	Short-term	Short-term	Long-term
Significance	**LOW (-)**	**VERY LOW (-)**	**NEUTRAL**
Probability	Definite	Definite	Definite
Confidence	Certain	Certain	Certain
Reversibility	Reversible	Reversible	Reversible

Mitigation measures

- All site workers to undergo environmental induction training ("toolbox talks") before undertaking work so that they are aware of the various environmental requirements.
- Landowners should be consulted regarding the placement of stockpile sites and toilets as well as access routes. This must be indicated on the site camp layout plan.
- Ensure that closed gates are kept closed. When in doubt, the landowner should be consulted.
- Follow the EMPr with regard to sanitation facilities, waste management, noise and site management
- Utilise local labour wherever possible to reduce potential friction within the community caused by bringing outside personnel in.
- Ensure that all workers wear the yellow/blue attire indicative of WfWetlands personnel so that they are not mistaken for trespassers.

7.1.4 Heritage resources

Please note that SAHRA issued a decision on the application on 15 April 2019 during the previous application. SAHRA's letter, which includes additional mitigation measures, has been included in the Soutini Baleni Rehabilitation Plan for the teams to comply with during the implementation phase should Environmental Authorisation be received. A copy of this decision is also available in **Appendix B4** of this report.

Phase	Pre-Construction	Construction	Operational	Decommissioning
Impact description	**Iron age deposit site:** Several concentrations of pot shards and ash around the wetland as well as the remains of an old hut were found at location 23°25'13" S 30°54'52" E. The hut remains is located next to a large donga that is threatening the site. It is believed that this site was occupied during the early first millennium. Potential impacts on heritage resources can thus be linked to			

	disturbances to this site and the discovery of sub-surface remains of heritage sites during the construction phase. *Cumulatively, this impact was rated as being of high significance. However, this can be mitigated to have a low negative cumulative impact.*		
	Pre-Mitigation	**Post-Mitigation**	**No-go Alternative**
Type	Negative	Negative	Neutral
Extent	Regional	Regional	Regional
Magnitude	High	Low	Zero
Duration	Medium-term	Medium-term	Long-term
Significance	**Medium (-)**	**Low (-)**	**NEUTRAL**
Probability	Probable	Unlikely	Definite
Confidence	Sure	Sure	Sure
Reversibility	Irreversible	Reversible (partly)	Irreversible
Mitigation measures			
○ Undertake an archaeological excavation at site 23°25'13" S 30°54'52" E (under a permit issued by SAHRA) prior to the commencement of implementing an intervention at the site. ○ All site staff shall be informed of the possibility of the occurrence of subsurface heritage resources and the procedures to be undertaken should such finds occur. ○ Should any artefact or suspected artefact (e.g. ash deposits, animal/human bone concentrations, ceramic fragments/ pot shards and formal stone concentrations), or any site of cultural significance be encountered during construction: ○ The Contractor must immediately stop work within a 50m radius of the site and immediately alert the relevant authorities. ○ The area around the discovery (with a 50m radius buffer) shall be cordoned off until such time that work is authorised to proceed. Public access to the site must be limited. ○ Should human remains be discovered, the South Africa Police Services (SAPS) and the provincial heritage authority[11] shall be notified immediately. ○ Excavated sites where artefacts have been discovered shall not be refilled without appropriate instructions have been received from the provincial heritage authority. ○ Media statements shall only be released as agreed upon with the relevant authorities[12].			

Phase	Pre-Construction	**Construction**	Operational	Decommissioning
Impact description	**Cattle fence:** According to the specialist assessment, the proposed cattle fence will be a low impact activity which will not impact on the heritage value of the site.			
	Pre-Mitigation	**Post-Mitigation**	**No-go Alternative**	
Type	Negative	Negative	Neutral	
Extent	Local	Local	Local	
Magnitude	Low	Low	Zero	
Duration	Medium-term	Medium-term	Long-term	
Significance	**Low (-)**	**Low (-)**	**NEUTRAL**	

[11] The heritage specialist recommended that the SAPS and the heritage consultant be contacted in the case of human remains being discovered. This recommendation has however been amended by the EAP to ensure compliance with Section 36(6) of the National Heritage Resources Act (Act 25 of 1999) which states that *"…any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority…"*

[12] The heritage specialist's recommendation required that the heritage practitioner should indicate when media statements may be issued.

Probability	Unlikely	Unlikely	Definite
Confidence	Sure	Sure	Sure
Reversibility	Reversible (partly)	Reversible (partly)	Irreversible
Mitigation measures			
No additional mitigation measures were identified by the heritage specialist.			

Phase	Pre-Construction	**Construction**	Operational	Decommissioning
Impact description	**Grave Site:** A single grave site was identified at the location 23°25'13" S 30°54'52" E, outside the proposed rehabilitation footprint. However, according to the specialist assessment, this site should not be impacted on by the proposed wetland rehabilitation activities – especially since the proposed activities would mainly involve the placement of rock packs in erosion channels to trap sediment. *Cumulatively, this impact was rated as being of high significance. However, this can be mitigated to have a low negative cumulative impact.*			

	Pre-Mitigation	**Post-Mitigation**	**No-go Alternative**
Type	Negative	Negative	Neutral
Extent	Local	Local	Regional
Magnitude	Low	Low	Zero
Duration	Medium-term	Medium-term	Long-term
Significance	**Medium (-)**	**Low (-)**	**NEUTRAL**
Probability	Probable	Unlikely	Definite
Confidence	Sure	Sure	Sure
Reversibility	Irreversible (barely)	Irreversible (partly)	Irreversible

Mitigation measures

- A buffer of 25m radius shall be applied to the grave site and shall be a no-go area.
- No rocks may be collected on site. All rocks shall be sourced from a licenced borrow pit or in compliance with Section 7.1.8.
- Should any artefact or suspected artefact (e.g. ash deposits, animal/human bone concentrations, ceramic fragments/ pot shards and formal stone concentrations), or any site of cultural significance be encountered during construction:
  - The Contractor must immediately stop work within a 50m radius of the site and immediately alert the relevant authorities.
  - The area around the discovery (with a 50m radius buffer) shall be cordoned off until such time that work is authorised to proceed. Public access to the site must be limited.
  - Should human remains be discovered, the South Africa Police Services (SAPS) and the provincial heritage authority shall be notified immediately.
  - Excavated sites where artefacts have been discovered shall not be refilled without appropriate instructions have been received from the provincial heritage authority.
  - Media statements shall only be released as agreed upon with the relevant authorities[12].

7.1.5 Worker safety

Phase	Pre-Construction	**Construction**	Operational	Decommissioning
Impact description	Alien clearing requires very specific training and involves high risk equipment such as chainsaws. It sometimes involves large trees and therefore extreme caution needs to be exercised.			

	Crime and poor water quality could also have a negative impact on worker safety and health, especially in urban areas. Furthermore, workers may also come into contact with dangerous animals such as snakes or even predators when working in conservation areas. If the interventions are not implemented, the construction workers will not be affected by the dangers associated with working within the selected wetlands.		
	Pre-Mitigation	**Post-Mitigation**	**No-go Alternative**
Type	Negative	Negative	Negative
Extent	Site Specific	Site Specific	Site Specific
Magnitude	Medium	Low	Zero
Duration	Long-term	Long-term	Long-term
Significance	**MEDIUM (-)**	**LOW (-)**	**NEUTRAL**
Probability	Definite	Definite	Definite
Confidence	Certain	Certain	Certain
Reversibility	Irreversible	Irreversible	Irreversible
Mitigation measures			
○ All site workers to undergo specific safety training before undertaking this work so that they are aware of the various risks and measures to be taken in emergency situations. ○ Where required, security teams must be provided to protect the teams on site. ○ Follow Occupational Health and Safety requirements. ○ Personal Protective Equipment (PPE) shall be worn at all times on site.			

7.1.6 Flora and fauna

Phase	Pre-Construction	**Construction**	Operational	Decommissioning
Impact description	Habitat disturbance Habitat disturbance during the construction stage is typically temporary. In addition, most species are relatively tolerant of disturbance and would be able to utilise the similar alternative habitat available in the study area. The area of habitat loss is also likely to be small and limited to the immediate surroundings of the intervention being constructed. Disturbance of protected species Construction activities could potentially result in disturbance to habitats required by protected species. It can however be almost completely mitigated by liaising with the appropriate conservation bodies whose local representatives can advise on appropriate measures and construction timeframes. Disturbance of avifauna The area is highly utilised by cattle as well as people (i.e. the herders and salt collectors). Furthermore, the proposed wetland rehabilitation activities will be focused on degraded wetlands for a short amount of time to improve habitat quality and the integrity of the ecosystem. Furthermore, no bird species of conservation concern was observed during the planning site visit by the wetland specialist. Alien species invasion A potential construction-related impact on vegetation is the possibility of an increase in alien invasive species due to disturbance and weed seeds being brought in with borrow and construction material. The no-go alternative would mean that the positive impacts identified above would not be realised. Continued wetland degradation and habitat loss is likely to result in exponential increase in the significance of the no-go alternative, leading to an eventual loss of biodiversity			

	and disruption of floral and faunal ecosystems. In addition, it would also negatively affect the achievement of conservation objectives for the area.		
	Pre-Mitigation	**Post-Mitigation**	**No-go Alternative**
Type	Negative	Negative	Negative
Extent	Site Specific	Site Specific	Site Specific
Magnitude	Medium	Low	Low
Duration	Long-term	Long-term	Long-term
Significance	**MEDIUM (-)**	**LOW (-)**	**MEDIUM (-)**
Probability	Definite	Definite	Likely
Confidence	Certain	Certain	Sure
Reversibility	Irreversible	Irreversible	Irreversible
Mitigation measures			
○ Should any protected species need to be removed or relocated, the appropriate permits shall be required. These activities shall take place under strict guidance from the ASD and/or appropriate authority. ○ Should any protected species occur on site, the ASD and project manager or implementer must liaise prior to site establishment with the relevant conservation body to determine measures required during the construction period to limit potential disturbances to protected species. ○ Implement the provisions of the EMPr regarding stockpiling borrowed material and rehabilitation after construction.			

7.1.7 Aquatic ecosystems

Phase	Pre-Construction	**Construction**	Operational	Decommissioning
Impact description	<u>Temporary alteration to stream flow patterns</u> Construction must often take place in areas that are permanently wet. This requires that water be diverted away from working areas, leading to temporary alterations in the current drainage characteristics. Water diversion is typically done using sand bags to slow/block flow and then a pump to remove water and discharge it further downstream. This can result in a slight drying in the working areas and may affect aquatic organisms. This will however be of a temporary nature and is unlikely to significantly alter flow patterns. <u>Sedimentation</u> Construction activities can result in additional sediment ending up in the water course (e.g. due to earthworks or breakage of sandbags used to divert water away from working areas). Sediment can result in silt build-up downstream, increase the turbidity of the water and result in habitat changes. However, as wetlands are typically low-energy systems, much of the excess sediment is likely to be trapped before it is washed far downstream. Also, given the limited nature of the earthworks, sedimentation is not anticipated to occur to a significant degree. <u>Pollution of water-courses</u> Construction activities close to a water-course/wetland carry the attendant risk that construction-related pollutants could end up in the wetland system. Typical pollutants include hydrocarbons (e.g. from fuel leaks, shutter oil and lubricating fluid spills), litter, cement and contaminated wash-down water. <u>Disturbance of wetland vegetation and stream banks</u> Some disturbance to stream banks and wetland vegetation will be inevitable in order to construct the proposed interventions. This impact generally occurs on a small scale and can be mitigated via good management practices. Pursuing the no-go option would result in the current negative ecosystem impacts continuing. These impacts would include desiccation, erosion, channel incision, etc.			

	Pre-Mitigation	Post-Mitigation	No-go Alternative
Type	Negative	Negative	Negative
Extent	Site Specific	Site Specific	Site Specific
Magnitude	Medium	Low	Medium
Duration	Long-term	Long-term	Long-term
Significance	**MEDIUM (-)**	**LOW (-)**	**MEDIUM (-)**
Probability	Definite	Definite	Definite
Confidence	Certain	Certain	Certain
Reversibility	Irreversible	Irreversible	Irreversible
Mitigation measures			
○ Work shall predominantly take place during low rainfall periods. ○ No foreign vegetation matter (e.g. mulch) shall be allowed on site (especially from alien species). ○ Soils shall be stockpiled according to the different soil layers as per the soil profile in order not to mix layers of leached and organic soils. ○ Stockpiles and revegetated areas shall be covered with mulch or cloth (geotextile) and kept moist. ○ Implement the provisions of the EMPr regarding stockpile location and site management. ○ Sandbags used to temporarily divert water shall be in a good condition to prevent additional sedimentation and/ or failure. ○ Sand/ earth to fill the bags shall be obtained from and returned to existing excavation points where feasible. ○ Soil required for the construction of interventions shall be stabilised as per the engineer's recommendations to counteract dispersive tendencies. ○ Water abstracted above the General Authorization limits must be authorized by DWS prior to such abstraction taking place.			

7.1.8 Sourcing borrow material

Phase	Pre-Construction	**Construction**	Operational	Decommissioning
Impact description	Borrow material (earth and rocks) may not be collected on site and must be sourced elsewhere. This can have a negative biophysical impact to the area where it is sourced. The quantities required are not such that they require a borrow pit licence. Costs increase the further one gets from site and therefore borrow material is sourced as close to site as possible. Sources include existing borrow areas on neighbouring farms, decommissioned dam walls (younger than 60 years) and man-made berms which are no longer required. Should the borrow material not be required, the potential impact would be neutral.			

	Pre-Mitigation	Post-Mitigation	No-go Alternative
Type	Negative	Negative	Negative
Extent	Site Specific	Site Specific	Site Specific
Magnitude	Medium	Low	Zero
Duration	Long-term	Long-term	Long-term
Significance	**MEDIUM (-)**	**LOW (-)**	**NEUTRAL**
Probability	Definite	Definite	Definite
Confidence	Certain	Certain	Certain
Reversibility	Irreversible	Irreversible	Irreversible

Mitigation measures
○ Implement the provisions of the EMPr. ○ Any quantities in excess of the minimum requirements for a borrow pit licence will require authorisation through Department of Mineral Resources. ○ Borrow areas will need to be properly re-sloped and re-vegetated after use.

7.1.9 Working in peatlands

Phase	Pre-Construction	Construction	Operational	Decommissioning
Impact description	Peatlands are sensitive ecosystem types and construction activities could degrade the soils if not properly mitigated, resulting in habitat destruction, loss of carbon storage capacity and water retention ability of the system. The direct impact of working within peatlands is the potential harm that can be caused through incorrect management on site. Note that the proposed rehabilitation interventions required for the Soutini-Baleni wetland, will not require the removal or extraction of peat or peat soils. The proposed interventions affecting the mires requires the placement of brush on top of them as protection against grazers. One of the interventions also allows for the establishment of a cattle fence – but again, this will not require any peat or peat soils to be removed or extracted. For more detail on these interventions, please refer to the Soutini-Baleni Rehabilitation Plan. By not implementing interventions in peatlands, sensitive environments would be lost, and carbon would be released into the atmosphere. In addition, once peatlands are dried out, they become hydrophobic and prone to fires that are very difficult to manage and stop.			

	Pre-Mitigation	Post-Mitigation	No-go Alternative
Type	Negative	Negative	Negative
Extent	Site Specific	Site Specific	Site Specific
Magnitude	Medium	Low	Medium
Duration	Long-term	Long-term	Long-term
Significance	**MEDIUM (-)**	**LOW (-)**	**HIGH (-)**
Probability	Definite	Definite	Definite
Confidence	Certain	Certain	Certain
Reversibility	Irreversible	Irreversible	Irreversible

Mitigation measures
• Mitigation measures included in the EMPr shall be implemented. • Topsoil stockpiles should be protected from drying out as per the requirements of the EMPr. • No fires are permitted on site.

7.1.10 Potential impact on visitors to the salt works

Phase	Pre-Construction	Construction	Operational	Decommissioning
Impact description	The following potential impacts on tourism have been considered: <u>Accessibility to the salt works</u> The road to the salt works could potentially be closed off due to construction activities, preventing visitors from reaching the salt works. <u>Visitor safety</u> Construction sites could potentially be dangerous to unauthorised visitors. Access would thus need to be carefully managed.			

	Disturbance to sense of place The proposed rehabilitation activities will not be taking place at the salt works and should not be visible from the salt works. However, there is a risk that visitors may feel that the sense of place have been disturbed as a result of the construction activities taking place. Pursuing the no-go option would result in the current negative ecosystem impacts continuing. These impacts would include desiccation, erosion, channel incision, etc. which would continue to threat the area's sense of place, as well as accessibility to visitors.

	Pre-Mitigation	Post-Mitigation	No-go Alternative
Type	Negative	Negative	Negative
Extent	Site Specific	Site Specific	Local
Magnitude	Low	Zero	Medium
Duration	Construction period	Construction period	Long term
Significance	**VERY LOW (-)**	**NEUTRAL**	**MEDIUM (-)**
Probability	Probable	Probable	Probable
Confidence	Sure	Sure	Sure
Reversibility	Reversible	Reversible	Irreversible

Mitigation measures

- Mitigation measures included in the EMPr shall be implemented.
- The layout plan shall take into account that tourists may be visiting the salt works.
- Litter and general waste shall be managed in accordance with the requirements of the EMPr.
- No material shall be placed in the roads and no vehicles shall block access to the salt works. Should this be required, approval must be obtained from the relevant authorities first.
- Visitors to the salt works should be informed at the Ivory Route Information Office of the wetland rehabilitation activities taking place and the positive objectives that will be achieved as a result.
- A notice board shall be displayed at the site, providing contact details for the WfWetlands Programme, the Implementing Entity and emergency contact details (see Chapter 6 of the EMPr).
- A detailed complaints register shall be kept and maintained on site as per Section 4.3 of the EMPr.
- A detailed incident register shall be kept and maintained on site as per Section 6.2 of the EMPr.

7.2 OPERATIONAL PHASE

7.2.1 Changes in land use

Phase	Pre-Construction	Construction	Operational	Decommissioning
Impact description	The increase in wetland area may have both positive and negative impacts for landowners. Wetlands are often utilised for grazing during the dry season and an increase in wetland area will thus improve grazing conditions for the farmer. However, the increase in wet areas may also make previously accessible areas inaccessible for farming purposes. The extent and magnitude of this impact will depend to a large degree on how much value each individual landowner places on wetland conservation. It is however assumed that if the landowner is willing to allow wetland rehabilitation to take place on their property that they see the value in the WfWetlands Programme and are willing to accept the increase in wetland area. Potential positive impacts associated with increased wetland area and improved grazing conditions would not be realised should rehabilitation activities not be implemented. Furthermore, drained wetlands are often more susceptible to erosion, resulting in the removal of fertile topsoil and thereby reducing the agricultural potential of the site.			

	Pre-Mitigation	Post-Mitigation	No-go Alternative
Type	Positive and Negative	Positive and Negative	Negative
Extent	Site Specific	Site Specific	Site Specific
Magnitude	Medium	Low	Medium
Duration	Long-term	Long-term	Long-term
Significance	**LOW (+)**	**MEDIUM (+)**	**MEDIUM (-)**
	MEDIUM (-)	**LOW (-)**	
Probability	Definite	Definite	Likely
Confidence	Certain	Certain	Sure
Reversibility	Irreversible	Irreversible	Irreversible
Mitigation measures			
○ Ensure good access for landowners in the form of crossing points, where such measures be of the lowest impact type and design possible. ○ Provision of watering points for stock to minimise extensive trampling in the wetlands (especially in the wetter times of year).			

7.2.2 Increased water storage and reduced treatment costs

Phase	Pre-Construction	Construction	**Operational**	Decommissioning
Impact description	Wetlands can offer valuable stream flow regulation and filtration services. By restoring wetland area, it is likely that downstream users will benefit by having a more reliable and possibly cleaner source of water. In addition, by addressing erosion, wetland rehabilitation can decrease the amount of sediment downstream. This can help to reduce water treatment costs for downstream users and will also reduce the sedimentation of downstream water storage facilities such as dams. The no-go alternative would mean that the positive impacts identified above would not be realised. In addition, the water retention and storage potential of the system and catchment would continue to decrease, while damage to properties and infrastructure resulting from flood events would increase. Furthermore, with lower water quality in the systems, more human treatment processes (i.e. water treatment plants) would be required to ensure that water is fit for human use which would require significant engineering and procurement cost.			

	Pre-Mitigation	Post-Mitigation	No-go Alternative
Type	Positive	Positive	Negative
Extent	Site Specific	Site Specific	Site Specific
Magnitude	Medium	Low	Medium
Duration	Long-term	Long-term	Long-term
Significance	**MEDIUM (+)**	**MEDIUM (+)**	**MEDIUM (-)**
Probability	Definite	Definite	Definite
Confidence	Certain	Certain	Certain
Reversibility	Irreversible	Irreversible	Irreversible
Mitigation measures			
○ No mitigation measures are proposed			

7.2.3 Reduced soil erosion

Phase	Pre-Construction	Construction	Operational	Decommissioning
Impact description	By reducing exposed ground surfaces and surface runoff velocity, the sediment load in surface runoff is reduced, thereby contributing to better water quality in the sub-catchment area. If the proposed interventions are not implemented, erosion would continue and even accelerate over time. This would reduce the agricultural potential of farmland, as well as increase damages to properties and infrastructure during flood events.			
	Pre-Mitigation	**Post-Mitigation**	**No-go alternative**	
Type	Positive	Positive	Negative	
Extent	Site Specific	Site Specific	Site Specific	
Magnitude	Medium	Low	Medium	
Duration	Long-term	Long-term	Long-term	
Significance	**MEDIUM (+)**	**MEDIUM (+)**	**MEDIUM (-)**	
Probability	Definite	Definite	Definite	
Confidence	Certain	Certain	Certain	
Reversibility	Irreversible	Irreversible	Irreversible	
Mitigation measures				
○ No mitigation measures are proposed				

7.2.4 Employment opportunities

Phase	Pre-Construction	Construction	Operational	Decommissioning
Impact description	Ideally, the skills learned by the project team during the construction phase – such as how to work with concrete, build gabions etc. – can be used to assist them to find permanent employment. If the interventions are not implemented, and the teams are not provided with these skills, the impact will be neutral as there will be no change to the *status quo*.			
	Pre-Mitigation	**Post-Mitigation**	**No-go Alternative**	
Type	Positive	Positive	Positive	
Extent	Site Specific	Site Specific	Site Specific	
Magnitude	Medium	Low	Zero	
Duration	Long-term	Long-term	Long-term	
Significance	**MEDIUM (+)**	**MEDIUM (+)**	**NEUTRAL**	
Probability	Definite	Definite	Definite	
Confidence	Certain	Certain	Certain	
Reversibility	Irreversible	Irreversible	Irreversible	
Mitigation measures				
○ No mitigation measures are proposed				

7.2.5 Public safety

Phase	Pre-Construction	Construction	Operational	Decommissioning
Impact description	Interventions such as gabion weirs, for example, could potentially be used for stream crossings or a swimming hole by local communities which could potentially have serious health and safety risks. However, the purpose of the rehabilitation interventions is not to provide watering holes or public infrastructure, but to trap sediment (i.e. filling up dongas, erosion channels, etc.) and reduce overland flow-velocities. It is possible that even if the interventions are not implemented, the individuals who might be at risk from the use of the wetlands would still be at risk in degraded wetlands. It is even possible that degraded systems could have hidden risks such as stuck branches or boulders that could become dislodged.			

	Pre-Mitigation	Post-Mitigation	No-go Alternative
Type	Negative	Negative	Negative
Extent	Site Specific	Site Specific	Site Specific
Magnitude	Medium	Low	Medium
Duration	Long-term	Long-term	Long-term
Significance	**MEDIUM (-)**	**LOW (-)**	**MEDIUM (-)**
Probability	Definite	Definite	Likely
Confidence	Certain	Certain	Certain
Reversibility	Irreversible	Irreversible	Irreversible

Mitigation measures

- Consult with landowners and the local community to ensure that they are aware of, and educated in, the ecological values and sensitivity of the wetland environments, as well as the exact location of the intervention structures to be implemented.

7.2.6 Ecosystem functioning

Phase	Pre-Construction	Construction	Operational	Decommissioning
Impact description	<u>Restoring wetland corridors</u> In areas where wetlands have been artificially drained, restoration can result in the re-wetting of areas and link up previously wet areas, thus creating and extending a network of wetland areas. These wetland corridors can provide valuable refuges for wetland species and allow for greater ecosystem connectivity. <u>Changes in water quality and quantity</u> More natural stream flow patterns within the wetland, as well as an improvement in water quality and quantity (due to improved ecosystem services) can be expected after rehabilitation. This improvement in water quality and a more reliable supply of water is particularly important given the water scarcity that faces South Africa. Should the proposed interventions not be implemented, the wetland systems selected as priority wetlands for rehabilitation, would continue to degrade. This degradation would lead to a loss in ecosystem services, and could result in large downstream impacts such as flooding.			

	Pre-Mitigation	Post-Mitigation	No-go Alternatives
Type	Positive	Positive	Negative
Extent	Site Specific	Site Specific	Site Specific
Magnitude	Medium	Low	Medium
Duration	Long-term	Long-term	Long-term
Significance	**MEDIUM (+)**	**HIGH (+)**	**MEDIUM (-)**

Probability	Definite	Definite	Likely
Confidence	Certain	Certain	Sure
Reversibility	Irreversible	Irreversible	Irreversible
Mitigation measures			
○ ***Note:*** The interventions identified for the proposed rehabilitation project were identified during a screening process that was undertaken to ensure that the most suitable intervention was identified, developed and assessed for each rehabilitation site. During this screening process, the project team also took into account environmental, social and economic considerations, as well as the rehabilitation objectives identified for the wetland. ○ Should these interventions not be implemented, the current rate of degradation at the assessed wetlands would continue and in some cases even result in the permanent loss of the integrity and functioning of these systems. It would also not be possible to achieve the rehabilitation objectives identified for the wetlands. Without the implementation of wetland rehabilitation as part of the WfWetlands project, the overall programme objectives[13] and the EPWP requirements would not be realised. ○ No mitigation measures are proposed.			

7.2.7 Flora and fauna

Phase	Pre-Construction	Construction	**Operational**	Decommissioning
Impact description	Increased habitat Increasing the wetland area through rehabilitation will result in an increase in habitat for wetland-dependent species. Increased biodiversity A large proportion of the natural vegetation in the greater area has already been lost agricultural activities. Restoring wetland habitat will help to increase the species richness of the overall area by encouraging the re-establishment of wetland species. Change in species composition In wetlands that have been subject to desiccation, plants that are tolerant of drier conditions are likely to have become established. With the restoration of the wetland, these species are likely to be replaced with wetland-adapted vegetation. This change in composition reflects a shift back to historical species composition and is thus considered positive. Should the interventions not be implemented, the positive benefits described above would not be realised. The fauna and flora would respond to the wetland degrading and would likely result in a loss of biodiversity.			

	Pre-Mitigation	**Post-Mitigation**	**No-go Alternative**
Type	Positive	Positive	Negative
Extent	Site Specific	Site Specific	Site Specific
Magnitude	Medium	Low	Medium
Duration	Long-term	Long-term	Long-term
Significance	**MEDIUM (+)**	**MEDIUM (+)**	**MEDIUM (-)**
Probability	Definite	Definite	Definite
Confidence	Certain	Certain	Certain
Reversibility	Irreversible	Irreversible	Irreversible

[13] Wetland conservation and poverty reduction through job creation and skills.

Mitigation measures
○ ***Note:*** The interventions identified for the proposed rehabilitation project were identified during a screening process that was undertaken to ensure that the most suitable intervention was identified, developed and assessed for each rehabilitation site. During this screening process the project team also took into account environmental, social and economic considerations, as well as the rehabilitation objectives identified for the wetland. ○ Should these interventions not be implemented, the current rate of degradation at the assessed wetlands would continue and in some cases even result in the permanent loss of the integrity and functioning of these systems. It would also not be possible to achieve the rehabilitation objectives identified for the wetlands. Without the implementation of wetland rehabilitation as part of the WfWetlands project, the overall programme objectives and the EPWP requirements would not be realised. ○ No mitigation measures are proposed.

7.2.8 Working in peatlands

Phase	Pre-Construction	Construction	**Operational**	Decommissioning
Impact description	Peatlands, only covering 3% of the Earth's land, store a third of the global soil carbon (Joosten 2010). This means that as an **indirect positive impact**, undertaking this rehabilitation project would ensure that carbon is stored in the soils and not released into the atmosphere as a greenhouse gas, which has been shown to contribute to global warming.			

	Pre-Mitigation	**Post-Mitigation**	**No-go Alternative**
Type	Positive	Positive	Negative
Extent	Local	Local	International
Magnitude	Low	Medium	High
Duration	Long-term	Long-term	Long-term
Significance	**LOW (+)**	**MEDIUM (+)**	**HIGH (-)**
Probability	Definite	Definite	Likely
Confidence	Certain	Certain	Certain
Reversibility	Irreversible	Irreversible	Irreversible

Mitigation measures
• No mitigation measures are proposed.

7.2.9 Potential impact on visitors to the salt works

Phase	Pre-Construction	Construction	**Operational**	Decommissioning
Impact description	The proposed rehabilitation activities would not only improve ecosystem function and biodiversity, but also the general sense of place due to the visual improvements to the area (i.e. vegetated surfaces, no erosion dongas, increased numbers of avifauna, etc.). Pursuing the no-go option would result in the current negative ecosystem impacts continuing. These impacts would include desiccation, erosion, channel incision, etc. which would continue to threat the area's sense of place, as well as accessibility to visitors.			

	Pre-Mitigation	**Post-Mitigation**	**No-go Alternative**
Type	Positive	Positive	Negative
Extent	Site Specific	Site Specific	Local
Magnitude	Low	Low	Medium

Duration	Long term	Long term	Long term
Significance	**MEDIUM (+)**	**MEDIUM (+)**	**MEDIUM (-)**
Probability	Probable	Probable	Probable
Confidence	Sure	Sure	Sure
Reversibility	Reversible	Reversible	Irreversible
Mitigation measures			
• No mitigation measures are proposed.			

8 CONCLUSION AND WAY FORWARD

8.1 Conclusion

Based on the above, it is the opinion of the EAP that the positive long-term bio-physical and socio-economic aspects of the project as a whole greatly outweigh the minor negative construction related impacts, particularly since effective mitigation measures to reduce the negative impacts exist. There are no indications to suggest that the preferred alternative will have a significant detrimental impact on the environment. Instead, a long-term positive impact is anticipated. This is discussed in further detail below:

Construction Phase:

It is most likely that all identified construction related impacts would be limited to the duration of this phase. Impacts on the bio-physical environment are generally considered to be of **Medium (-)** to **Low (-)** significance, which can be reduced to **Low (-)** and **Very Low (-)** with the implementation of appropriate mitigation measures. Construction related impacts can generally be very effectively managed through the implementation and regular auditing of an EMPr. Although several sites of heritage value are located within the study area, only one site will be directly affected by the proposed anti-erosion measures, namely the cattle fence within the wetland, the anticipated impact on heritage resources is **Medium (-)** which can be mitigated to **Low (-)**. The impact on the socio-economic environment is expected to be **Medium** to **High (+)** due largely to the creation of jobs and up-skilling of local workers.

Operational Phase:

Potential Operational Phase related impacts for both the bio-physical and socio-economic environments are generally considered to be of **Medium to High (+)** significance. These positive impacts are expected to arise due to the following:

- Improved wetland habitat for red data species;
- Improved wetland services (which has benefits for downstream as well as local users); and
- Empowering of local community.

The impacts detailed above in **Chapter 7** are summarised below in **Table 16**.

Table 16: Impact summary table

COLOUR KEY			
High Negative	Red	Neutral	White
Medium Negative	Orange	Low Positive	Light Blue
Low Negative	Yellow	Medium Positive	Blue
Very Low Negative	Light Yellow	High Positive	Green

Construction Phase: Description of Impact	**Significance of Impact**		
	Preferred Alternative		**No-Go**
	No Mitigation	**With mitigation**	
Job creation	Medium (+)	High (+)	High (-) Neutral
Fire risk	Medium (-)	Low (-)	Low (-)
Nuisance impacts	Low (-)	Very Low (-)	Neutral
Impact on heritage resources: Iron age deposit site	Medium (-)	Low (-)	Neutral
Impact on heritage resources: Cattle fence	Low (-)	Low (-)	Neutral
Impact on heritage resources: Grave site	Medium (-)	Low (-)	Neutral
Worker safety	Medium (-)	Low (-)	Neutral
Flora and fauna	Medium (-)	Low (-)	Medium (-)
Aquatic ecosystem impacts	Medium (-)	Low (-)	Medium (-)
Sourcing borrow material	Medium (-)	Low (-)	Neutral
Working in peatlands	Medium (-)	Low (-)	High (-)
Potential impact on visitors to the salt works	Very Low (-)	Neutral	Medium (-)
Operational Phase: Description of Impact			
Changes in land use	Low (+) Medium (-)	Medium (+) Low (-)	Medium (-)
Increased water storage and reduced treatment costs	Medium (+)	Medium (+)	Medium (-)
Reduced soil erosion	Medium (+)	Medium (+)	Medium (-)
Employment	Medium (+)	Medium (+)	Neutral
Public safety	Medium (-)	Low (-)	Medium (-)
Ecosystem functioning	Medium (+)	High (+)	Medium (-)
Flora and fauna	Medium (+)	Medium (+)	Medium (-)
Working in peatlands	Low (+)	Medium (+)	High (-)

Construction Phase: Description of Impact	Significance of Impact		
	Preferred Alternative		No-Go
	No Mitigation	With mitigation	
Potential impact on visitors to the salt works	Medium (+)	Medium (+)	Medium (-)

8.2 Level of Confidence in Assessment and Recommendation of the EAP

Based on the information provided in this report, the outcome of the impact assessment and the supporting documentation it is the recommendation of the EAP that authorisation be granted for the following reasons:

a) The proposed rehabilitation activities are likely to have significant positive bio-physical and socio-economic benefits, not just for the local community for the whole country.

b) Effective mitigation measures exist to manage the limited negative impacts that were identified.

c) The proposed rehabilitation activities are in line with the principles of NEMA (in particular: people and their needs – particularly women and children – are placed at the forefront of development via the EPWP; the development can be considered to be socially, environmentally and economically sustainable; the environmental impacts of the activity are not unfairly distributed and the potential environmental impacts have been assessed and evaluated).

d) The WfWetlands Programme is an important part of the government's EPWP and given that the impacts of the proposed activities are not likely to be detrimental to the environment, this programme should be supported in the spirit of co-operative governance.

It is recommended that the following conditions should be included by the Department of Environmental Affairs in the Environmental Authorisation (should a positive decision be reached):

- Mitigation measures listed in this BAR should be referenced as conditions of approval.
- Construction activities must take place in accordance to the requirements of the attached EMPr, which also includes general requirements from the WfWetlands Best Management Practices Plan.
- Regular auditing of the EMPr must take place.

With regards to period for which the EA would be required, a validity period of 5 years is requested to allow for the implementation of the rehabilitation plan over multiple years – depending on the availability of budget.

Please find a signed EAP declaration signed in **Appendix E**.

8.3 Way Forward

The work proposed in the above-mentioned wetland systems are further detailed in a project specific Rehabilitation Plan, consisting of work that is planned for the following years' implementation cycle.

Each Rehabilitation Plan include a detailed description of the wetland system, the problems affecting the wetland as well as the proposed rehabilitation strategy. Input into this report is provided by the project engineer, wetland specialist, EAP, and WfWetlands ASD. The Rehabilitation Plan also include the engineering drawings and bill of quantities of the specific intervention planned to address the site-specific issue.

A general Environmental Management Programme (EMPr) (**Appendix D**) is included in both the BAR and Rehabilitation Plan and provides a set of guidelines and requirements for the implementing teams to ensure that each intervention does not do unnecessary harm to the environment. Where site-specific mitigation measures are required, these are included in the intervention booklets provided as an annexure to the Rehabilitation Plan.

9 REFERENCE LIST

Department of Water Affairs and Forestry (2006). *Letaba Catchment Reserve Determination Briefing document.* [ONLINE] Available at: http://www.dwa.gov.za/rdm/documents/Briefing%20Document.pdf. [Accessed 28 January 2019].

Gaigher, S (2018). *Heritage Impact Assessment for the Proposed Anti - Erosion Measures at the Baleni Salt Works Provincial Heritage Site, Limpopo Province*. Phase 1 Heritage Impact Assessment Report. Heritage Management Consultants.

Limpopo Provincial Government Department of Sport, Arts and Culture (2007). Provincial Gazette for Limpopo No. 1333, Vol. 14 (GN 92 of 2007).

Mucina, L. and Rutherford, M.C. (eds). 2006. *The vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. SANBI.

SANBI Biodiversity GIS (2018). *BGIS Map Viewer-Limpopo Conservation Plan version 2*. [ONLINE] Available at: http://bgis.sanbi.org. [Accessed 16 October 2018]

Statistics South Africa. [ONLINE] Available at: http://www.statssa.gov.za/?page_id=993&id=greater-giyani-municipality. [Accessed 16 October 2018].

The South African State of Rivers Report: Letaba and Luvuvhu Rivers - The Letaba River. [ONLINE] Available at: http://www.dwaf.gov.za/iwqs/rhp/state_of_rivers/state_of_letluv_01/letaba.html. [Accessed 28 January 2019].

Derwent, S (2013). *Sacred Soutini*. [ONLINE] Available at: http://www.africanivoryroute.co.za/wp-content/uploads/2014/07/Sacred-Soutini-by-Sue-Derwent-in-Country-Life.pdf. [Accessed 17 October 2018].

Visioning the future of the Letaba catchment – the 12 Integrated Units of Analysis (IUAs) in perspective [ONLINE] Available at: http://www.dwaf.gov.za/rdm/WRCS/doc/Visioning%20Info%20Pack.pdf. [Accessed 28 January 2019].

Linstrom, A (2019). *Soutini Baleni Phase 2: Wetland Status Quo Report*. Prepared by Wet Earth Eco Specs (Pty) Ltd as part of the planning phase for the Working for Wetlands Rehabilitation Programme.

Appendix A

ENGINEERING BOOKLET

Working for Wetlands:
Examples of Interventions

This page was left blank intentionally

Contents

This page was left blank intentionally

1 INTRODUCTION

Each year during a Phase 2 planning site visit, a team consisting of an Engineer, a Wetland Specialist, the Working for Wetlands Provincial Coordinator and an Environmental Assessment Practitioner (EAP) plan a series of interventions to rehabilitate a priority wetland. These interventions are selected in a methodological manner, to specifically use the knowledge of the catchment to address the identified wetland problems.

The purpose of this document is to provide an overview of the typical interventions that are designed for the Working for Wetlands Programme. The site-specific details and drawings of the proposed interventions for each planning year will be included in the project rehabilitation plans, which shall be approved by the Department of Environmental Affairs prior to any construction commencing.

2 PROCESS FOR SELECTION

The choice of the combination of the most appropriate interventions necessary to achieve a certain rehabilitation objective is a rigorous exercise, and the decision is informed by several criteria.

- **Environmental** – E.g. Hydrology, geology and soils, seasonal influences, vegetation and site-specific constraints;
- **Engineering** – E.g. Biophysical aspects, risk and liability, construction material selection;
- **Social** – E.g. Labour quota requirements, health and safety, availability of materials, skills levels and opportunity for skills development; and
- **Rehabilitation objective(s)** – E.g. Stabilisation of head-cuts and erosion gullies, elevation of water table, eco-services, biodiversity value, sediment trapping eradication of problem species (among others), etc.

From these criteria, the choice is then made to implement either a “hard” or “soft” intervention. Hard engineering intervention may include, for example:

- Earth berms or gabion systems to block artificial channels that drain water from or divert polluted water to the wetland;
- Concrete and gabion weirs to act as settling ponds, to reduce flow velocity or to re-disperse water across former wetland areas thereby re-establishing natural flow paths;
- Earth or gabion structure plugs to raise channel floors and reduce water velocity;
- Concrete or gabion structures to stabilise head-cut or other erosion and prevent gullies;
- Concrete and/or reno mattress strips as road crossings to address channels and erosion in wetlands from vehicles; and
- Gabion structures (mattresses, blankets or baskets) to provide a platform for the growth of desired wetland vegetation.

Soft engineering interventions are often used together with the hard engineering interventions and could include, for example:

- The use of biodegradable or natural soil retention systems such as eco-logs, MacMat-R plant plugs, grass or hay bales, and brush-packing techniques;
- The re-vegetation of stabilised areas with appropriate wetland and riparian plant species;
- Alien invasive plant clearing, which is an important part of wetland rehabilitation (this is supported by the Working for Water Programme).
- The fencing off of sensitive areas within the wetland to keep grazers out and to allow for the re-establishment of vegetation;

- In some instances, the use of appropriate fire management and burning regimes. The removal of undesirable plant and animal species; and

Typical interventions are further described in the following section, and typical engineering drawings are included in Appendix A1.

3 TYPICAL INTERVENTIONS

3.1 Weirs

A dam-type structure placed across a watercourse. Weirs are used to address head-cut and/ or channel erosion by trapping sediment and raising the local water table to encourage overland flow (i.e. rewetting a wetland).

3.1.1 Concrete weirs

Concrete is used to construct weirs in high energy areas, such as active headcuts. They are impermeable and effectively trap sediment as well as water, reducing the flow velocity. For this reason, they are also used to raise the local water table. Selection of this intervention depends on the availability of appropriate foundation material and the volume of water moving through the wetland catchment. The construction of concrete weirs also provides an opportunity for skills transfer and development.

3.1.2 Stone masonry weirs

Stone masonry structures are built using an option similar to brickwork. Individual stones are used to build a solid structure using a mixture of cement and sand as the bonding mortar between them. The use of these, as any other hard structure, should be considered in cases where the desired outcomes require the strength of concrete, while at the same time a rougher finish to the surface of the structure or a more natural appearance is desired.

3.1.3 Gabion weirs

Gabion weirs comprise packed stone or rock in wire baskets. The configuration of the gabion baskets can result in the structure performing a similar function to a concrete or stone masonry weir in trapping sediment and reducing flow-velocities. Although gabion basket is permeable and allows for a measure of water to pass through the structure. Vegetation and other biota can also establish in/around the habitat they create. The construction of gabion weirs is more labour intensive than concrete weirs and thus favoured where site conditions are suitable. Some negative aspects associated with gabions: rock is not always readily available, they are vulnerable to vandalism and corrosive elements in some waters; and trampling by cattle and humans (this can be alleviated by concrete capping the gabions).

3.2 Earthworks

Earthworks interventions are characterised by their use of earth (soil or rock) that is moved to form features that will restore natural overland flow. All earthworks have a high labour requirement for implementation and are a common intervention in the Working for Wetlands Programme.

3.2.1 Cut and fill

Cut and fill is applicable where earth can be moved from one place to another to make the ground more level and restore natural overland flow. An example is in areas which have been impacted by ridge/ furrow farming and involve cutting the “ridges” and filling the “furrows” wherever possible.

3.2.2 Earth berms

Earth berms are typically an earth mound used to divert or retain water flow. Berms can be specified across a road to prevent water channelling along the road, or can be used to divert polluted water away from a wetland. Existing berms can also be removed in areas already impacted by farming which have used berms to divert or contain water. Berms are usually considered suitable in low flow areas, but can be susceptible to cattle trampling if not properly vegetated or capped with rocks.

3.2.3 Earth plugs

Similar to earth berms (3.2.2), plugs are suitable for low flow areas and involve the plugging of channel floors to reduce the water velocity.

3.2.4 Dam walls

Earthern dam walls in areas used for farming can be removed / breeched to restore natural flow along a channel.

3.2.5 Roads

Old roads can cause impacts within a wetland and can be removed to restore natural overland flow.

3.3 Rock packs

The packing of rocks within a channel or across a slope can dissipate energy, slow down water velocity and trap sediment. Rock packing is a labour-intensive practice which is favourable for employment purposes.

3.3.1 Rock packs (in channel)

Rock packs in channel are used as sediment traps which slow down flow velocities and prevent erosion in the upstream section of the channel. A filter material such as geofabric is typically incorporated into the rock pack to prevent fine material from moving through it.

3.3.2 Rock packs (on slope)

When placed on a slope, rock packs are used to slow run-off and trap sediment to enhance vegetation re-growth.

3.4 Road crossings

Road crossings can address deep tracks and numerous channels which form when vehicles travel through a frequently wet area or on a steep slope. These involve either concrete and/or reno mattress strips being laid down as tracks for the vehicles. Reno specifically allows for the flow of water across the tracks which is applicable specifically in low lying areas of a wetland.

3.5 Biodegradable or natural soil retention systems

Sometimes biodegradable or natural soil retention systems are used to serve as sediment traps. These allow natural vegetation to establish, and in doing so supports the stabilisation of an area.

3.5.1 Brush packs

Brush packing involves the placing of branches and heavy vegetation on a relatively flat eroded surface to slow down water velocities which in turn promotes sedimentation and increased opportunity for vegetation to re-establish itself. The placing of thorny tree species, such as *Acacia*, also discourages animals from using the area as a pathway.

3.5.2 Ecologs

Ecologs are tightly wrapped cylinders of fibre held together with mesh wire. The fibre is typically derived from coconuts and is bio-degradable. Ecologs are used to stabilise minor watercourses with a relatively minor change in level from the top to the bottom of the slope. They act as small sediment traps and allow natural vegetation to establish in the fibre.

3.5.3 MacMat-R

MacMat-R is a mesh reinforced three-dimensional geomat that is be applied for erosion control. The three-dimensional mesh structure traps sediment which in turn promotes the re-establishment of vegetation. MacMat-R is typically applied on a wet exposed face which has a gentle slope across it.

3.5.4 Geocells lining

The geocells are used for erosion control, soil stabilization and channel protection. This can be done using concrete or earth infill. The concrete infill is suitable for high inflow channels and earth infill is usually used on low inflow channels.

3.5.5 Silt fence

This intervention reduces and stops erosion in dongas with small catchment areas by means of cheap and easily constructed structure. The structure requires vertical posts to be knocked into the ground, followed by netting being draped across and tied firmly to the vertical posts.

3.6 Vegetation management

The presence of alien invasive plants, or lack of vegetation cover can have significant impacts on riparian areas as well as the flow of water instream.

3.6.1 Revegetation

Revegetation of degraded areas within wetlands using appropriate wetland and riparian plant species can improve the hydrological integrity of the system by stabilising soils and will re-establishing wetland habitat. For each site-specific intervention, the Wetland Specialist will recommend the measures required to revegetate the area (e.g. species, planting requirements, monitoring, etc.).

3.6.2 Alien invasive plant clearing

Alien invasive plants affect the ecological functioning of wetlands and therefore clearing is an important part of wetland rehabilitation. Clearing is undertaken in conjunction with the Working for Water Programme which also prioritise job creation and upliftment of local communities.

3.7 Alternative measures

In some previous occurrences, alternative measures that add value to the use of the wetland system have been included in the Working for Wetlands Programme, such as:

- Fencing;
- Boardwalks;
- Bird hides;
- Floating wetlands; and
- Fish ladders.

However, as these interventions are generally an exception rather than the rule, more information will be provided on them in the reports in which they are planned for.

WORKING FOR WETLANDS

Guideline on Generic Intervention Structures for Wetland Rehabilitation Purposes

SOFT OPTIONS

DRAWING No.	SHEET No.	DRAWING DESCRIPTION
109664-STD-01	Sheet 1 of 6	LIST OF DETAILS
109664-STD-01	Sheet 2 of 6	ECOLOGS
109664-STD-01	Sheet 3 of 6	ROCK PACKS
109664-STD-01	Sheet 4 of 6	ROAD STRIPS
109664-STD-01	Sheet 5 of 6	BERMS
109664-STD-01	Sheet 6 of 6	MACMAT / MACMAT-R

NOTE: THESE DETAILS MAY BE ADJUSTED TO SUIT INDIVIDUAL SITE CONDITIONS

NOTES

1. AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
2. AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON HAVING LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY PROGRESS.

EARTHWORKS/ EARTH STRUCTURES :

1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
2. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED. 100mm OF TOP SOIL TO COVER BERM. REVEGETATION TO BE UNDERTAKEN AS PER EMP / REHAB PLAN.
3. SOIL FOR BERMS AND BACKFILL TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

1. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BASE OF THE INTERVENTION SHOULD THEREFORE BE CONSTRUCTED AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
2. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY).
3. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

aurecon
www.aurecongroup.com

CLIENT

REV	DATE	REVISION DETAILS	APPROVED
A	29/10/2013	ISSUED FOR INFORMATION	D.TOWNSHEND

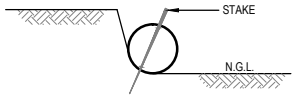
SCALE	SIZE
NOT TO SCALE	A4
DRAWN	
A.MNYAKA	
DESIGNED	
D.TOWNSHEND	
VERIFIED	
F.NAGDI	

PRELIMINARY
NOT FOR CONSTRUCTION
APPROVED
ENGINEER DATE

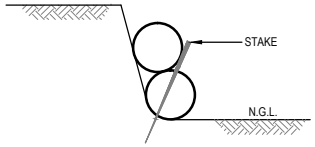
PROJECT	WORKING FOR WETLANDS
TITLE	STANDARD DETAILS
DESCRIPTION	LIST OF DETAILS
DRAWING No.	109664 - STD-01

1 OF 6

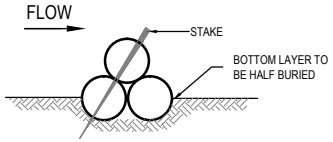
REV A



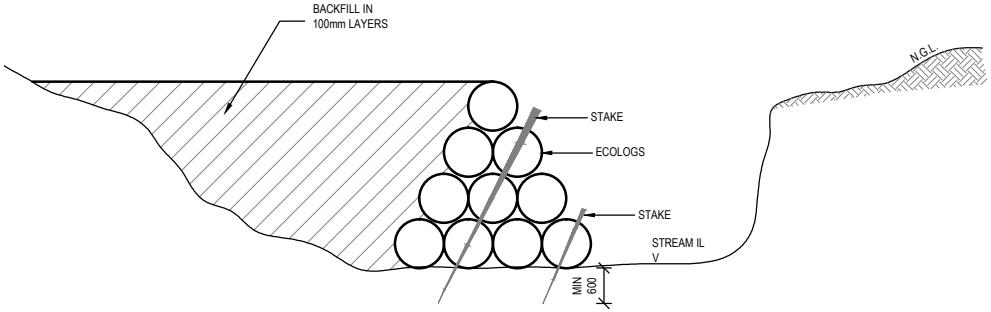
ECOLOG : OPTION 1



ECOLOG : OPTION 2



ECOLOG : OPTION 3



ECOLOG : OPTION 4

NOTES

1. AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
2. AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON HAVING LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY PROGRESS.

EARTHWORKS/ EARTH STRUCTURES :

1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
2. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED. 100mm OF TOP SOIL TO COVER BERM. REVEGETATION TO BE UNDERTAKEN AS PER EMP / REHAB PLAN.
3. SOIL FOR BERMS AND BACKFILL TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

1. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BASE OF THE INTERVENTION SHOULD THEREFORE BE CONSTRUCTED AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
2. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY).
3. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

ECOLOGS:

1. WOODEN PEGS USED TO ANCHOR ECOLOGS ARE TO BE NO LESS THAN 40mm DIA AND 1000mm IN LENGTH.
2. PEGS SHOULD PROTRUDE NO LESS THAN 600mm FROM THE SOIL @ 1000 c/c.

NOTE: THESE DETAILS MAY BE ADJUSTED TO SUIT INDIVIDUAL SITE CONDITIONS

aurecon
www.aurecongroup.com

CLIENT

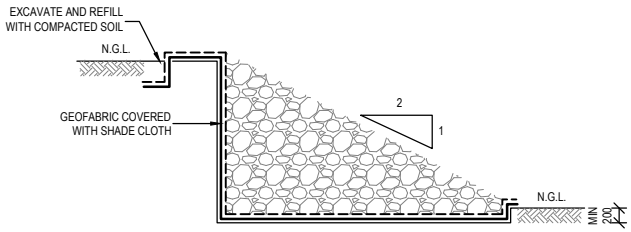
REV	DATE	REVISION DETAILS	APPROVED
A	29/10/2013	ISSUED FOR INFORMATION	D.TOWNSHEND

SCALE	SIZE
NOT TO SCALE	A4
DRAWN	A.MNYAKA
DESIGNED	D.TOWNSHEND
VERIFIED	F.NAGDI

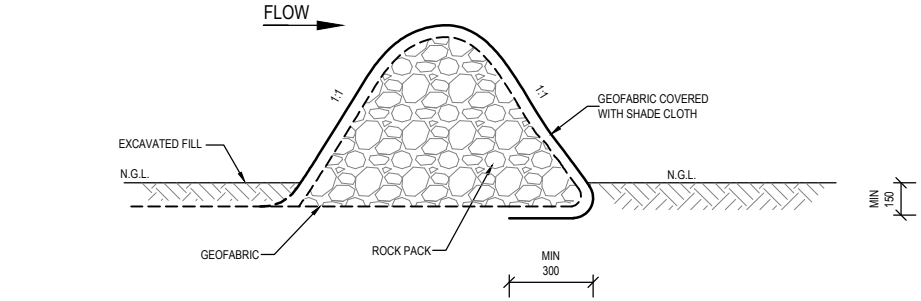
PRELIMINARY
NOT FOR CONSTRUCTION
APPROVED
ENGINEER DATE

PROJECT	WORKING FOR WETLANDS
TITLE	STANDARTD DETAILS
DESCRIPTION	ECOLOGS
DRAWING No.	109664 - STD-01

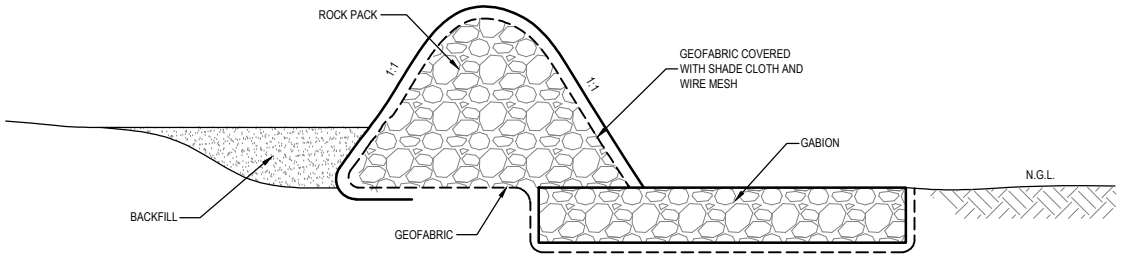
REV A



ROCK PACK : OPTION 1



ROCK PACK : OPTION 2



ROCK PACK : OPTION 3

NOTE: THESE DETAILS MAY BE ADJUSTED TO SUIT INDIVIDUAL SITE CONDITIONS

NOTES

1. AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
2. AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON HAVING LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY PROGRESS.

EARTHWORKS/ EARTH STRUCTURES :

1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
2. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED. 100mm OF TOP SOIL TO COVER BERM. REVEGETATION TO BE UNDERTAKEN AS PER EMP / REHAB PLAN.
3. SOIL FOR BERMS AND BACKFILL TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

1. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BASE OF THE INTERVENTION SHOULD THEREFORE BE CONSTRUCTED AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
2. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY).
3. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

ROCK PACKS:

1. 100mm -200mm STONE TO BE USED IN ROCK PACKS
2. STONE MUST BE NON-FRIABLE AND INSOLUBLE, e.g. GRANITE, BASALT, LIMESTONE OR SANDSTONE
3. ROCK PACKS PLACED ACROSS A STREAM TO BE TIED MIN 1m INTO EACH BANK.

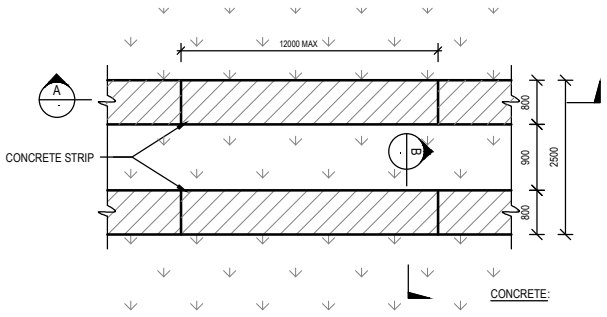
Plot Date: 12/11/2013 9:03:44 AM Office: ZACPT Filename: P:\PROJECTS\109664 WORKING - WETLANDS PLAN 2014-2017\ENGINEERING\03 PRJ DEL\2 REFERENCE\DRAWING TEMPLATES\STANDARD DETAILS\109664-STD-01.DWG

aurecon
www.aurecongroup.com

REV	DATE	REVISION DETAILS	APPROVED
A	29/10/2013	ISSUED FOR INFORMATION	D.TOWNSHEND

SCALE: NOT TO SCALE | SIZE: A4
DRAWN: A.MNYAKA
DESIGNED: D.TOWNSHEND
VERIFIED: F.NAGDI
PRELIMINARY
NOT FOR CONSTRUCTION
APPROVED
ENGINEER DATE

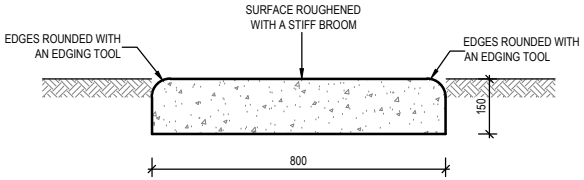
PROJECT: WORKING FOR WETLANDS
TITLE: STANDARTD DETAILS
DESCRIPTION: ROCK PACKS
DRAWING No.: 109664 - STD-01 | 3 OF 6 | REV A



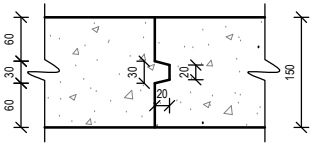
PLAN OF CONCRETE STRIP

CONCRETE:

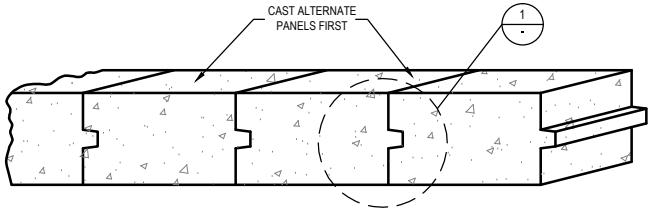
1. ALL BUTTRESS WEIR STRUCTURES TO USE MIN 20MPa CONCRETE MIX:
   1 BAG CEMENT
   95L SAND
   100L STONE
   27L WATER



SECTION B - (CONCRETE STRIP)
1:20



DETAIL 1 - (SCHEMATIC VIEW OF - JOINT BETWEEN PANELS)
1:10



SECTION A - (SCHEMATIC VIEW OF - JOINT BETWEEN PANELS)
1:10

NOTE: THESE DETAILS MAY BE ADJUSTED TO SUIT INDIVIDUAL SITE CONDITIONS

NOTES

1. AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
2. AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON HAVING LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY PROGRESS.

EARTHWORKS/ EARTH STRUCTURES:

1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
2. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED. 100mm OF TOP SOIL TO COVER BERM. REVEGETATION TO BE UNDERTAKEN AS PER EMP / REHAB PLAN.
3. SOIL FOR BERMS AND BACKFILL TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

1. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BASE OF THE INTERVENTION SHOULD THEREFORE BE CONSTRUCTED AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
2. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY).
3. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

aurecon
www.aurecongroup.com

CLIENT

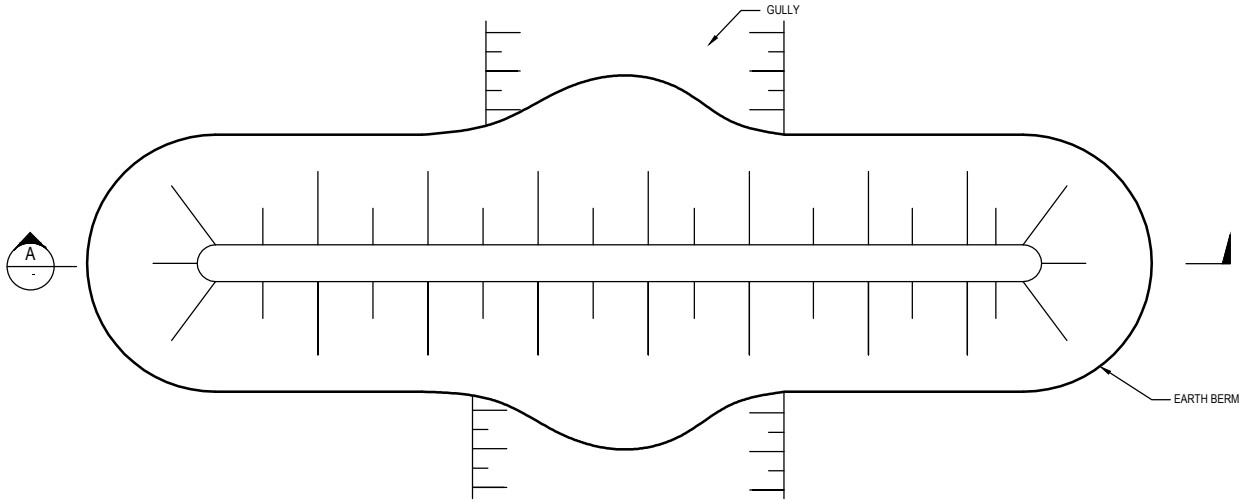
REV	DATE	REVISION DETAILS	APPROVED
A	29/10/2013	ISSUED FOR INFORMATION	D.TOWNSHEND

SCALE	SIZE
NOT TO SCALE	A4
DRAWN	
A.MNYAKA	
DESIGNED	
D.TOWNSHEND	
VERIFIED	
F.NAGDI	

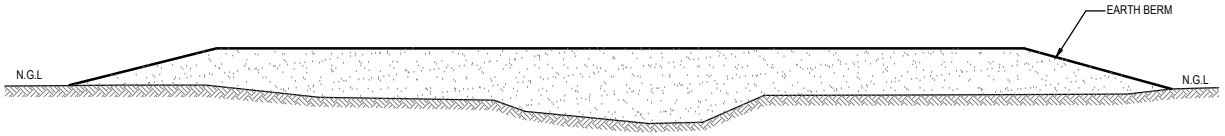
PRELIMINARY
NOT FOR CONSTRUCTION
APPROVED
ENGINEER DATE

PROJECT	WORKING FOR WETLANDS
TITLE	STANDARTD DETAILS
DESCRIPTION	ROAD STRIPS
DRAWING No.	109664 - STD-01

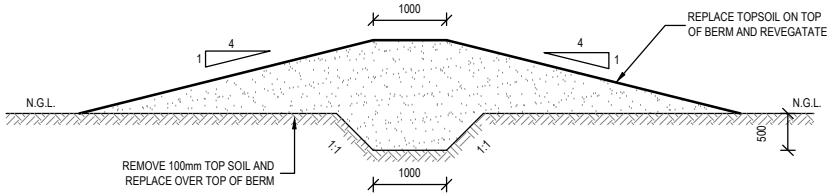
REV A



TYPICAL PLAN VIEW OF BERM



LONG SECTION THROUGH BERM



TYPICAL CROSS SECTION THROUGH BERM

NOTE: THESE DETAILS MAY BE ADJUSTED TO SUIT INDIVIDUAL SITE CONDITIONS

NOTES

1. AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
2. AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON HAVING LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY PROGRESS.

EARTHWORKS/ EARTH STRUCTURES :

1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
2. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED. 100mm OF TOP SOIL TO COVER BERM. REVEGETATION TO BE UNDERTAKEN AS PER EMP / REHAB PLAN.
3. SOIL FOR BERMS AND BACKFILL TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

1. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BASE OF THE INTERVENTION SHOULD THEREFORE BE CONSTRUCTED AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
2. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY).
3. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

Plot Date: 12/11/2013 9:03:54 AM Office: ZACPT Filename: P:\PROJECTS\109664 WORKING - WETLANDS PLAN 2014-2017\ENGINEERING\03 PRJ DEL\2 REFERENCE\DRAWING TEMPLATES\STANDARD DETAILS\109664-STD-01.DWG

aurecon
www.aurecongroup.com

CLIENT

REV	DATE	REVISION DETAILS	APPROVED
A	29/10/2013	ISSUED FOR INFORMATION	D.TOWNSHEND

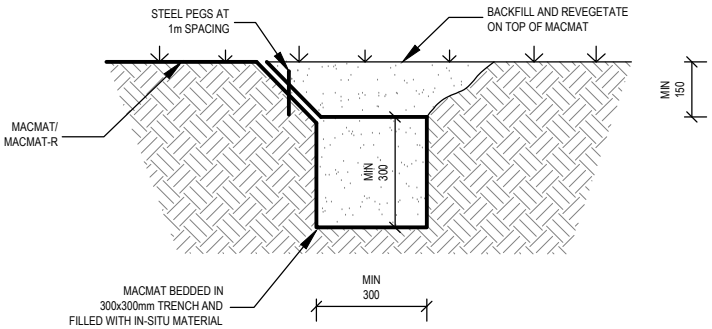
SCALE	SIZE
NOT TO SCALE	A4

DRAWN: A.MNYAKA
DESIGNED: D.TOWNSHEND
VERIFIED: F.NAGDI

PRELIMINARY
NOT FOR CONSTRUCTION
APPROVED
ENGINEER DATE

PROJECT	WORKING FOR WETLANDS
TITLE	STANDARTD DETAILS
DESCRIPTION	BERMS
DRAWING No.	109664 - STD-01

REV A



MACMAT / MACMAT-R EDGE DETAIL

1:25

NOTES

1. AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
2. AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON HAVING LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY PROGRESS.

EARTHWORKS/ EARTH STRUCTURES :

1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
2. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED. 100mm OF TOP SOIL TO COVER BERM. REVEGETATION TO BE UNDERTAKEN AS PER EMP / REHAB PLAN.
3. SOIL FOR BERMS AND BACKFILL TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

1. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BASE OF THE INTERVENTION SHOULD THEREFORE BE CONSTRUCTED AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
2. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY).
3. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

MACMAT / MACMAT-R

1. MACMAT / MACMAT-R TO BE INSTALLED TO MANUFACTURERS SPECIFICATIONS.

NOTE: THESE DETAILS MAY BE ADJUSTED TO SUIT INDIVIDUAL SITE CONDITIONS

aurecon
www.aurecongroup.com

CLIENT

REV	DATE	REVISION DETAILS	APPROVED
A	29/10/2013	ISSUED FOR INFORMATION	D.TOWNSHEND

SCALE	SIZE
NOT TO SCALE	A4
DRAWN	
A.MNYAKA	
DESIGNED	
D.TOWNSHEND	
VERIFIED	
F.NAGDI	

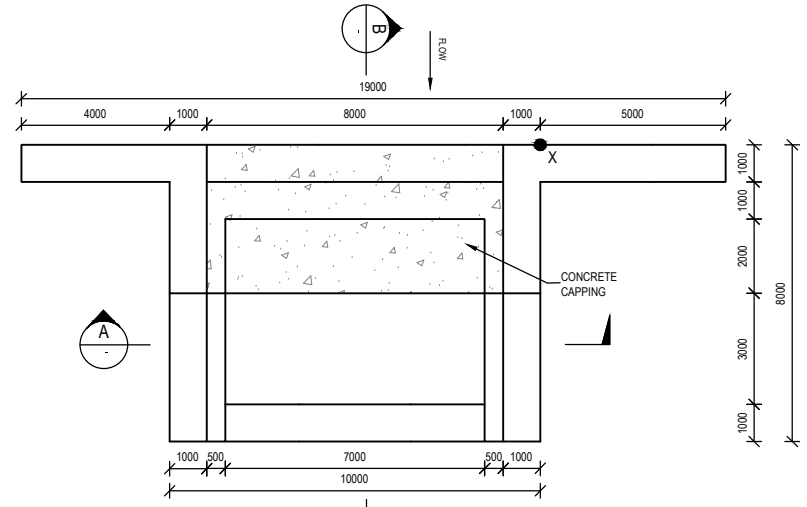
PRELIMINARY
NOT FOR CONSTRUCTION
APPROVED
ENGINEER DATE

PROJECT	WORKING FOR WETLANDS
TITLE	STANDARTD DETAILS
DESCRIPTION	MACMAT / MACMAT-R
DRAWING No.	109664 - STD-01

6 OF 6

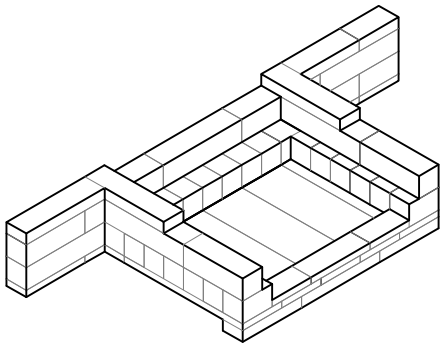
REV A

HARD OPTIONS



LAYOUT
N.T.S.

NOTE: CONFIGURATION AND DIMENSIONS OF STRUCTURE VARY ACCORDING TO SITE CONDITIONS



3D VIEW
N.T.S.

NOTES

1. AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
2. AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON HAVING LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY PROGRESS.

EARTHWORKS/ EARTH STRUCTURES :

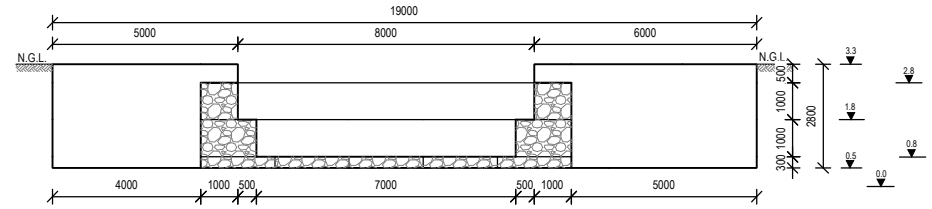
1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
2. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED. 100mm OF TOP SOIL TO COVER BERM. REVEGETATION TO BE UNDERTAKEN AT SUITABLE TIMING OF YEAR TO IMPROVE CHANCES OF TAKING.
3. SOIL FOR BERMS AND BACKFILL TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

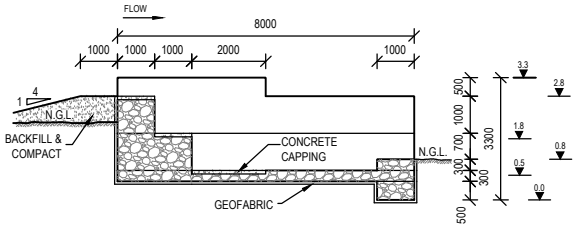
1. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BASE OF THE INTERVENTION SHOULD THEREFORE BE CONSTRUCTED AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
2. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
3. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

GABIONS:

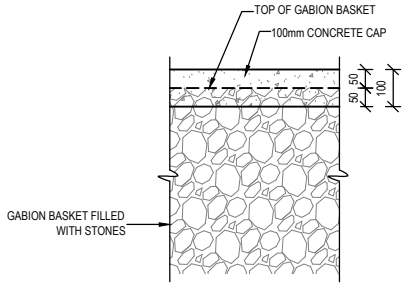
1. GABION BASKETS AND RENO MATTRESSES TO BE CONSTRUCTED OF DOUBLE TWISTED, HEXAGONAL, PVC COATED, GALVANISED WIRE MESH OF NOMINAL DIAMETER 80mm MESH, WITH 3.4mm o/d FRAME WIRE AND 2.7mm o/d MESH WIRE WITH PARTITIONS AT 1m CENTRES.
2. GEOFABRIC TO BE NON-WOVEN, NOT LESS THAN 195g/m². e.g. AG200.
3. 100mm - 200mm STONE TO BE USED IN ALL GABIONS AND RENO MATTRESSES. STONE FILL MUST BE NON-FRIABLE & INSOLUBLE e.g. GRANITE, BASALT, LIMESTONE OR SANDSTONE.
4. ALL GABIONS AND RENO MATTRESSES TO COMPLY WITH SANS-1200-DK.
5. CONCRETE CAPPING TO BE MINIMUM 15MPa & MIX:
   1 BAG CEMENT
   125L SAND
   120L STONE
   30L WATER
6. GEOFABRIC TO BE INSERTED AT ALL SOIL/MESH INTERFACES UNLESS OTHERWISE SPECIFIED.
7. GEOFABRIC TO HAVE WEEPHOLES PUNCHED THROUGH USING 10mm STEEL ROD AT APPROXIMATELY 4 HOLES/m² .
8. 250µ PLASTIC SHEET TO BE USED ON THE UPSTREAM FACE OF ALL STRUCTURES UNLESS OTHERWISE SPECIFIED



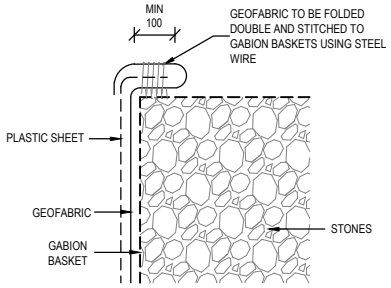
SECTION A
N.T.S.



SECTION B
N.T.S.



CONCRETE CAPPING DETAIL
N.T.S.



GEOFABRIC AND PLASTIC STITCHING DETAIL
N.T.S.

aurecon
www.aurecongroup.com

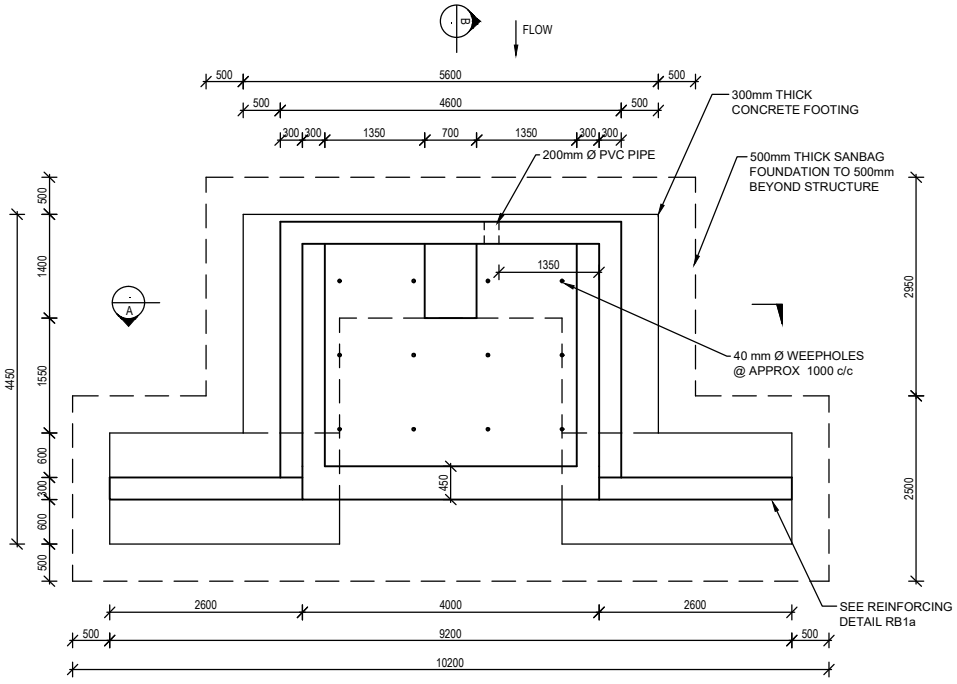
CLIENT						
Working for Wetlands						

REV	DATE	REVISION DETAILS	APPROVED
A	06/11/2013	ISSUED FOR INFORMATION	D.TOWNSHEND

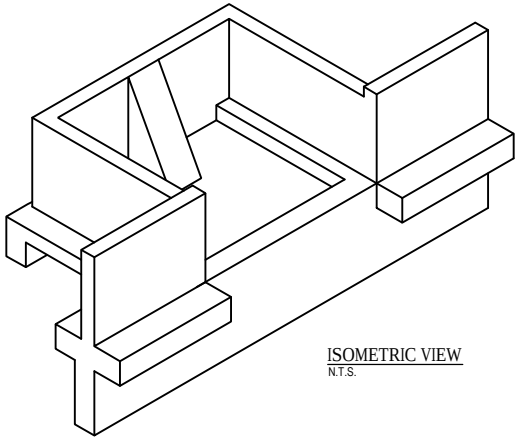
SCALE	SIZE
NOT TO SCALE	A4
DRAWN	
A.MNYAKA	
DESIGNED	
D.TOWNSHEND	
VERIFIED	
F.NAGDI	

PRELIMINARY
NOT FOR CONSTRUCTION
APPROVED
ENGINEER DATE

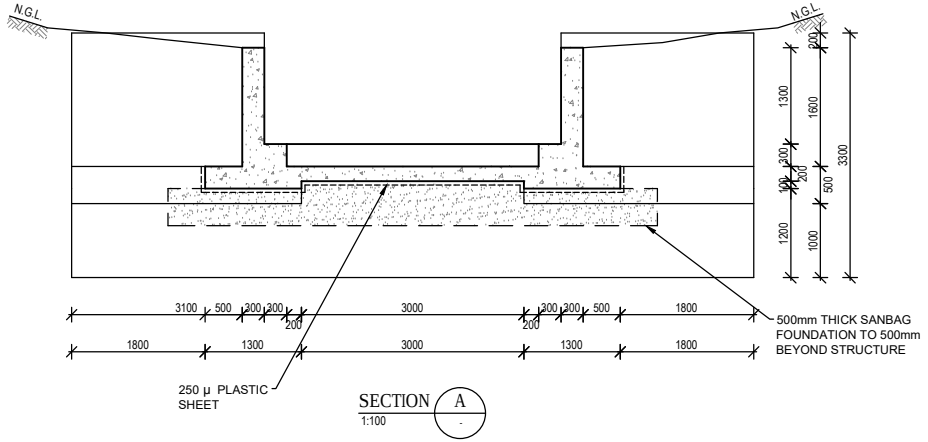
PROJECT	WORKING FOR WETLANDS
PROVINCE	
INTERVENTION DESCRIPTION	TYPICAL : GABION WEIR
DRAWING No.	109664 - STD - 20
REV	A



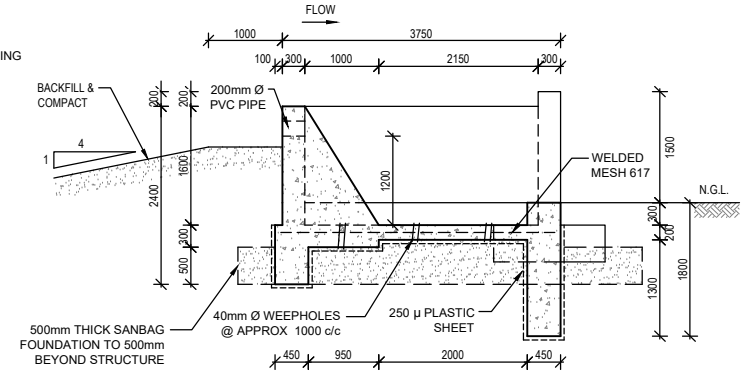
LAYOUT
1:100



ISOMETRIC VIEW
N.T.S.



SECTION A
1:100



SECTION B
1:100

NOTE: CONFIGURATION AND DIMENSIONS OF STRUCTURE VARY ACCORDING TO SITE CONDITIONS

NOTES

1. AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
2. AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON HAVING LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY PROGRESS.

EARTHWORKS/ EARTH STRUCTURES :

1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
2. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED. 100mm OF TOP SOIL TO COVER BERM. REVEGETATION TO BE UNDERTAKEN AT SUITABLE TIMING OF YEAR TO IMPROVE CHANCES OF TAKING.
3. SOIL FOR BERMS AND BACKFILL TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

1. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BASE OF THE INTERVENTION SHOULD THEREFORE BE CONSTRUCTED AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
2. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
3. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

CONCRETE:

1. NOMINAL SIZE OF STONE AGGREGATE TO BE SIZE 19-26mm.
2. ALL CONCRETE TO BE MIN 30MPa CONCRETE MIX:
   1 BAG CEMENT
   65L SAND
   85L STONE
   21L WATER
3. CONCRETE TO BE PLACED IN 300mm LAYERS AND VIBRATED USING A CONCRETE VIBRATOR.
4. MIN 50mm COVER REQUIRED ON ALL CONCRETE REINFORCING AND MESH UNLESS OTHERWISE SPECIFIED.
5. 250µ PLASTIC SHEET TO BE PLACED UNDER STRUCTURE.
6. ALL CONCRETE WALLS TO BE FULLY SUPPORTED UNTIL THEY ARE BACKFILLED TO THE DESIGNED LEVEL.
7. ALL MESH REINFORCING TO HAVE 500mm OVERLAPS BETWEEN SHEETS
8. BUTRESSES AND WALLS TO BE CAST MONOLITHICALLY WITH FOOTING.
9. CONSTRUCTION JOINTS TO BE USED WHEREVER NEW CONCRETE IS CAST AGAINST PREVIOUSLY CAST CONCRETE.
10. IF REBAR OR MESH CROSSES A CONSTRUCTION JOINT, IT SHOULD BE CONTINUOUS THROUGH THE JOINT AND EXTEND 600mm INTO EACH SIDE.

Plot Date: 12/11/2013 8:56:39 AM Office: ZACPT Filename: P:\PROJECTS\109664 WORKING - WETLANDS PLAN 2014-2017\ENGINEERING\03 PRJ DEL\2 REFERENCE\DRAWING TEMPLATES\STANDARD DETAILS\109664-STD-21.DWG

aurecon
www.aurecongroup.com

CLIENT: Working for Wetlands

REV	DATE	REVISION DETAILS	APPROVED
A	06/11/2013	ISSUED FOR COMMENT	D.TOWNSHEND

SCALE: AS SHOWN | SIZE: A4
DRAWN: N.ALLIE
DESIGNED: O.MOTHELESI
VERIFIED: D.TOWNSHEND

PRELIMINARY
NOT FOR CONSTRUCTION
APPROVED
ENGINEER DATE

PROJECT: WORKING FOR WETLANDS
PROVINCE:
INTERVENTION DESCRIPTION: TYPICAL : CONCRETE WEIR
DRAWING No.: 109664 - STD - 21
REV: A

Appendix B

PUBLIC PARTICIPATION

Appendix B1: DEA Meeting Minutes

Appendix B2: Landowner Agreements

Appendix B3: Written Notification

Appendix B4: Proof of Mailing

Appendix B5: Comments and Responses

Working for Wetlands: Limpopo Province

Public Participation Report

This page was left blank intentionally

1 INTRODUCTION

The proposed interventions for wetland rehabilitation require the Working for Wetlands (WfWetlands) Programme to apply for environmental authorisation in terms of the Environmental Impact Assessment (EIA) Regulations (Government Notice (GN) Regulation (R) 982) of the National Environmental Management Act (Act 107 of 1998) (NEMA), as amended. To ensure that the Department of Environmental Affairs (DEA) can make an informed decision, based on a transparent and meaningful process, this Basic Assessment (BA) process must undergo a Public Participation Process (PPP).

This PPP must be undertaken in accordance with regulations 39-44 of the EIA Regulations. Additional guidance has also been incorporated from the Western Cape[1] Department of Environmental Affairs and Development Planning (DEA&DP) Guideline Document on Public Participation (March 2013).

This Public Participation Report (PPR) has therefore been compiled to collectively represent the consultation process that has been undertaken through the PPP. The following sections include:

Section 2 A database of interested and affected parties (I&APs) has been created and updated over the last 13 planning years. This database will be updated and maintained throughout the BA process.

Section 3 The consultation that was undertaken during the pre-application phase of the project is described in this section. Proof of advertisements, site notices and deliveries is available in Appendix B4.

Section 4 Describes the consultation process that was undertaken during the BA phase. Proof of notification is available in Appendix B4

Section 5 Comments received during the PPP and responses provided have been summarised into a table in this section. All original comments and responses will be included in Appendix B5.

Section 6 This section explains the way forward once the public participation process has been completed

2 I&AP DATABASE

A register of I&APs has been recorded for WfWetlands over the previous planning years undertaken by Aurecon. The existing national and provincial database has been updated with information from new I&APs responding to the advertisements and site notices throughout the application process. Proactive identification of I&APs, municipal representatives, organs of state, competent authorities and surrounding landowners was also undertaken to update the database specific to the new planning year.

Table 1 on the following page provides a summary of the I&AP database for the Limpopo Province. Please note that contact details have been omitted for privacy reasons.

[1] These guidelines have been considered as best practice even though the project may be located outside of the province.

Table 1: I&AP Database

Stakeholder	Contact	Organisation
National Stakeholders	Mr Mark Anderson	Birdlife South Africa
	Ms Mpume Ntlokwana	Department of Agriculture Forestry & Fisheries
	Ms Serah Muobeleni	Department of Agriculture Forestry & Fisheries: Land Use and Soil Management
	Mr Stanley Tshitwamulomoni	Department of Environmental Affairs: Biodiversity Conservation
	Mr Danie Smit	Department of Environmental Affairs: Sensitive Environments
	Ms Naomi Fourie	Department of Water and Sanitation
	Dr Paul Meulenbeld	Department of Water and Sanitation
	Ms Jackie Jay	Department of Water and Sanitation
	Ms Barbara Weston	Department of Water and Sanitation
	Mr Kelvin Legge	Department of Water and Sanitation
	Mr Bongani Madikizela	Water Research Commission
	Ms Olga Jacobs	SANParks: Biodiversity and Social Projects
	Mr Steven Segang	Endangered Wildlife Trust
	Mr Ahmend Khan	Department of Environmental Affairs
	Mr Louwrens Ferreira	Department of Environmental Affairs
	Mr Wemer Roux	Department of Environmental Affairs
	Ms Kerryn Morrison	Endangered Wildlife Trust
	Ms Tanya Smith	Endangered Wildlife Trust
	Morgan Griffiths	WESSA
	Mr Dumisani Mabona	Department of Environmental Affairs: Sensitive Environments
	Mr Umesh Bahadur	Department of Environmental Affairs: Working for Wetlands
	Mr Farai Tererai	DEA: Working for Wetlands: Manager: Planning, Monitoring and Evaluation
	Dr Piet-Louis Grundling	Department of Environmental Affairs: Working for Wetlands
	Mr Seoka Lekota	DEA: Biodiversity Conservation
	Khosa Tsunduka	Department of Water and Sanitation
	Malaudzi Nkumbudzeni	Department of Water and Sanitation
	Lumka Kuse	Department of Water and Sanitation

Stakeholder	Contact	Organisation
	Xolani Hadebe	Department of Water and Sanitation
Provincial Stakeholders: State Authorities	Mr Thingahangwi Malotsha	Limpopo Department of Economic Development, Environment and Tourism
	Mr Chris S Nghenabo	Limpopo Department of Economic Development, Environment and Tourism
	Mr Vincent Egan	Limpopo Department of Economic Development, Environment and Tourism
	Mr Meshack Masindi	Limpopo Department of Economic Development, Environment and Tourism
	Mr Donald Lithole	Limpopo Heritage Resource Authority
	Mr Nimrod Mathivha	Department of Agriculture
	Mr David Nethengwe	Department of Water and Sanitation
	Mr Foletgi Mahlakoane	Department of Agriculture, Forestry & Fisheries
	Mr Sam Makhubele	Limpopo Department of Economic Development, Environment and Tourism
	Mr Solly Kgopong	Limpopo Department of Economic Development, Environment and Tourism
	Mr Vusi E Makhubele	Limpopo Department of Economic Development, Environment and Tourism
	Ms Magdeline Msimanga	Department of Water and Sanitation
	Mr Love Hlekane	Department of Water and Sanitation
	Mr Anton Van Wetten	Limpopo Department of Economic Development, Environment and Tourism
		Limpopo Department of Transport
		Department of Mineral Resources
		Department of Rural Development and Land Reform
Landowner	Mr Reuben Mabunda	Mahumani Tribal Authority
	Hosi Mahumani	Mahumani Tribal Authority
Municipal Stakeholders	Mr Madi Simon	Thulamela Local Municipality
	Mr C Mapholi	Vhembe District Municipality

Stakeholder	Contact	Organisation
	Mr Godfrey Mawela	Vhembe District Municipality
	HE Maluleke	Thulamela Local Municipality
	Mrs J Selapyane	Bela-Bela Local Municipality
	Cllr Thoma Tuaani	Thulamela Local Municipality
	Cllr TS Pandelane	Thulamela Local Municipality
	Mr Ombali Phineas Sebola	Modimolle/Mookgophong Local Municipality
	Ms Marlene Van Staden	Modimolle/Mookgophong Local Municipality
	Mr Robert Mokgalabone	Limpopo Tribunal
	Cllr M.J Aphiri	Limpopo Executive Council
	Cllr R.R Molapo	Limpopo Executive Council
	Mr Republic Monakedi	Mopani District Municipality
	Mr Dumisani Shitlhangu	Mopani District Municipality
	Ms Faith Maboya	Mopani District Municipality
	Cllr Nkakareng Rakgoale	Mopani District Municipality
	Maxwell Chauke	Greater Giyani Local Municipality
General I&APs	Mrs Kelly Abram	Waterberg Biosphere
	Mr Mick Angliss	LEDET
	J.A Bierman	Marievale Farms
	Mr Michael Breetzke	Southern Mapping
	Ms Terry Calmeyer	ILISO Consulting Environmental
	Mr Mahlomola Ernest Daemane	SANParks
	Mr Samuel Davidson-Phillips	Welgevonden Game Reserve
	Mr C.S Deetlefs	Smithvlei
	Ms Natasha Du Plessis	Nylsvley Nature Reserve
	Ms Marion Dunkeld-Mengell	Friends of Nylsvley
	Ms Helette Dunne	SANParks: BSP
	Martin Engelbrecht	Mapungubwe Conservation manager
	Prof Paul Fauche	University of Venda
	Ms Navashni Govender	SANParks

Stakeholder	Contact	Organisation
	Ms Cathy Greaver	SANParks
	Mr Zebulon Hlungwane	SANParks
	Steven Khoza	Private I&AP
	Ernest Lesoalo	University of Limpopo
	Ntombi Majozi	Private I&AP
	Mr Jerome Mandoma	Zwisimane
	Manoko Masilo	LEDET
	Ms Doris Maumela	Department of Water and Sanitation
	Mr Stephen Midzi	SANParks
	Mr Zebulon Modilkwe	Lepelle Northen Water Board
	Tumelo Mokgotho	Marakele Project Manager
	Mr Kesentseeng Mosotho	Limpopo Department of Agriculture
	Nketso Mphake	SANParks
	M.S. Mugivhi	LEDET
	Mr Daniel Mundalamo	Mutale Community Representative
	Mr Hector Muvhenzhe	SANParks: Field Assistant
	Anathi Nabi	Private I&AP
	Mr David Neguyuni	Mutale Community Representative
	Mphadeni Nthangeni	Marakele National Park
	Mr Kenny Phasha	Tsogang Water and Sanitation
	Ms Winnie Phuluwa	Department of Water and Sanitation
	Abel Ramavhale	Private I&AP
	Mr Marius Renke	SANParks
	Mr B Schroder	Welgevonden Game Reserve
	Mr Richard Selemela	Department of Agriculture
	CJ Smith	Roosvlei
	Mr Marius Snyders	Ripzone
	Mr Peter Tsheola	LEDET

Stakeholder	Contact	Organisation
	M.S Tshikundamalema	Tshikundamalema
	Kennedy Tshivase	Senior Traditional Leader
	Mr Eddie Ubisi	SANParks
	Mrs C West	Elangeni DooranDraai
	Nick Zambatis	Biodiversity Conservation
	Moses Ratshivhadelo	Tswelopele Ya Rena Tra. Co.
	Lorraine Maloma	Tswelopele Ya Rena Tra. Co.
	Sello Ledwaba	Department of Environmental Affairs
	Pamole Motshana	Private I&AP
	Thuso Maphuthu	Private I&AP
	Mr John Wesson	WESSA
	Thomas Tshivhandekano	Private I&AP

3 PRE-APPLICATION PHASE CONSULTATION

Prior to the circulation of the draft Basic Assessment Report (BAR) and submission of the application form to DEA, the following measures were undertaken to ensure that the legislated 30-day public comment period will reach the relevant parties.

3.1 Pre-application meeting with DEA

A pre-application meeting was undertaken on 14 August 2019 to discuss a new application process for this project. Please refer to Appendix B1 for a copy of the correspondence received from DEA on this matter.

3.2 Landowner consultation

Landowner consultation is a vital component of the Working for Wetlands Programme Standard Operating Procedures. Landowners were consulted with during the planned Phase 1 and Phase 2 site visits, and Landowner Agreements must be signed prior to any construction commencing. Although it can be difficult to access landowner agreements for the full wetland system (some wetlands have more than 30 properties intersecting the wetland), landowner agreements have been obtained for work where targeted rehabilitation interventions are planned for the following implementation cycles. Landowner Agreements are included in Appendix B2.

3.3 Advertisements

An advertisement was placed in a local newspaper, *Capricorn Voice,* to allow the public the opportunity to register their interest in the project. Proof of placement will be provided in the final report submitted to the Department upon completion of the 30-day public comment period. Please refer to Figure 1 for a copy of the advertisement text.

3.4 Site notices

Site notices were fixed at the property boundaries of the affected wetland systems and at public areas such as libraries or municipal buildings. The text of the site notice in English is included in Figure 2 and is followed by proof of placement of the site notices in the sub-section thereafter. The site notice was of a size and content required by the relevant guidelines. Proof of Placement will be provided in the final report submitted to the Department upon completion of the 30-day public comment period.

PUBLIC PARTICIPATION PROCESS: WORKING FOR WETLANDS PROGRAMME

Proposal: The Working for Wetlands (WfWetlands) Programme intends to rehabilitate a number of degraded wetlands within South Africa. The proposed wetland rehabilitation activities may require the construction of hard interventions, for instance gabion and concrete structures, as well as soft options such as re-vegetation and/ or alien plant removal. The number, type, scale and location of each of these interventions vary according to the nature and magnitude of the problem and the state of the wetland (i.e. the receiving environment).

Legal Framework: Authorisation is required in terms of the National Environmental Management Act (Act 107 of 1998), as amended, as described below:

A. National Environment Management Act, No. 107 of 1998 (NEMA), as amended: The rehabilitation proposals trigger a suite of activities which require Environmental Authorisation by means of a Basic Assessment (BA) process in terms of the 2014 Environmental Impact Assessment (EIA) Regulations (Government Notice Regulation (GN R) 982, as amended) pursuant to NEMA. Aurecon South Africa (Pty) Ltd (Aurecon) has been appointed to undertake the BA processes and separate provincial focused applications will be submitted to the Department of Environmental Affairs (DEA) as the competent authority. The Listed Activities that are relevant to each application in terms of the 2014 EIA Regulations are GN R 983 (as amended): 12, 19, 27 and 48 (Listing Notice 1), GN 984 (as amended): 24 (Listing Notice 2) and GN R 985 (as amended): 12, 14 and 23 (Listing Notice 3).

B. National Water Act, No. 36 of 1998 (NWA): In terms of Section 39 of the NWA, a General authorisation (GA) has been granted for certain activities that are listed under the Act that usually require a Water Use Licence; as long as these activities are undertaken for wetland rehabilitation and the primary purpose of the rehabilitation is for conservation purposes (i.e. GN R 1198 of 18 December 2009).

Opportunity to Participate: Notice is hereby given of a public participation process in terms of the NEMA EIA Regulations (2014) and the NWA (1998). Interested and Affected Parties (I&APs) are invited to register their interest for future correspondence to the people mentioned below and to submit comments on the Draft BA Reports and Rehabilitation Plans which will be made available for a 30-day public comment period in **October 2019.** Notification will be sent to all identified and registered I&APs prior to the start date of this comment period.

Province	Reports		Nearest City / Town(s)
	BAR	Rehabilitation Plan	
Eastern Cape	Yes	Amathole	Seymour
Gauteng	Yes	Gauteng North	Pretoria
KwaZulu-Natal	Yes	iSimangaliso	St Lucia
Limpopo	Yes	Soutini Baleni	Giyani

I&APs are requested to please refer to the relevant province and wetland project when registering, and provide their name, contact details and an indication of any direct business, financial, personal or other interest which they have to the contact person indicated below.

Contact: Simamkele Ntsengwane / Franci Gresse (of Aurecon)

E-mail: Simamkele.Ntsengwane@aurecongroup.com / franci.gresse@aurecongroup.com

Tel: 021 526 9560, **Fax:** 021 526 9500, or **Post:** P.O. Box 494, Cape Town, 8000

Agriculture, Forestry and Fisheries
Environmental Affairs
Water Affairs and Sanitation

EXPANDED PUBLIC WORKS PROGRAMME
Creating opportunities towards human fulfilment

Working for Wetlands

aurecon

Figure 1: Advertisement for the Working for Wetlands Programme 2017/2018 Planning Cycle

PUBLIC PARTICIPATION PROCESS: WORKING FOR WETLANDS PROGRAMME

LIMPOPO PROVINCE

Proposal: The Working for Wetlands (WfWetlands) Programme intends to rehabilitate a number of degraded wetlands within South Africa. The proposed wetland rehabilitation activities may require the construction of hard interventions, for instance gabion and concrete structures, as well as soft options such as re-vegetation and/ or alien plant removal. The number, type, scale and location of each of these interventions vary according to the nature and magnitude of the problem and the state of the wetland (i.e. the receiving environment).

The following wetland rehabilitation projects are proposed in the **Eastern Cape** Province for the 2018/2019 planning cycle:

PROJECT	WETLAND SYSTEM	NEAREST TOWN	LATITUDE (DDMMSS)	LONGITUDE (DDMMSS)
Mutale *	Nyahalwe	Thohoyandou	22°45'32.62"S	30°31'43.70"E
Soutini-Baleni	Soutini Baleni 01	Giyani	23°25'14.46"S	30°54'39.82"E
	Soutini Baleni 02		23°25'9.88"S	30°54'43.92"E
	Soutini Baleni 03		23°25'16.12"S	30°54'54.70"E

Legal Framework: Authorisation is required in terms of the National Environmental Management Act (Act 107 of 1998), as amended, as described below:

A. National Environment Management Act, No. 107 of 1998 (NEMA), as amended: The rehabilitation proposals trigger a suite of activities which require Environmental Authorisation by means of a Basic Assessment (BA) process in terms of the 2014 Environmental Impact Assessment (EIA) Regulations (Government Notice Regulation (GN R) 982, as amended) pursuant to NEMA. Aurecon South Africa (Pty) Ltd (Aurecon) has been appointed to undertake the BA processes and separate provincial focused applications will be submitted to the Department of Environmental Affairs (DEA) as the competent authority. The Listed Activities that are relevant to each application in terms of the 2014 EIA Regulations are GN R 983 (as amended): 12, 19, 27 and 48 (Listing Notice 1), GN 984 (as amended): 24 (Listing Notice 2) and GN R 985 (as amended): 12, 14 and 23 (Listing Notice 3).

B. National Water Act, No. 36 of 1998 (NWA): In terms of Section 39 of the NWA, a General authorisation (GA) has been granted for certain activities that are listed under the Act that usually require a Water Use Licence; as long as these activities are undertaken for wetland rehabilitation and the primary purpose of the rehabilitation is for conservation purposes (i.e. GN R 1198 of 18 December 2009).

Opportunity to Participate: Notice is hereby given of a public participation process in terms of the NEMA EIA Regulations (2014) and the NWA (1998). Interested and Affected Parties (I&APs) are invited to register their interest for future correspondence to the people mentioned below and to submit comments on the Draft BA Reports and Rehabilitation Plans which will be made available for a 30-day public comment period in **October 2019.** Notification will be sent to all identified and registered I&APs prior to the start date of this comment period.

More information can be found in a 'context document' available for download from Aurecon's website (http://aurecongroup.com/en/public-participation.aspx).

Contact: Simamkele Ntsengwane / Franci Gresse (of Aurecon)

E-mail: Simamkele.Ntsengwane@aurecongroup.com / franci.gresse@aurecongroup.com

Tel: 021 526 9560 **Fax:** 021 526 9500, or **Post:** P.O. Box 494, Cape Town, 8000

Agriculture, Forestry and Fisheries
Environmental Affairs
Water Affairs and Sanitation

EXPANDED PUBLIC WORKS PROGRAMME
Creating opportunities towards human fulfilment

Working for Wetlands

aurecon

Figure 2: Example of text included in the Limpopo site notice

4 BASIC ASSESSMENT PHASE CONSULTATION

The Basic Assessment Report (BAR) for the Eastern Cape Province was made available for a 30-day public comment period from 11 February to 14 March 2019. However, in response to comments that were received from DEA, it was agreed to make the BAR available for a second public comment period with the applicable rehabilitation plans. The second 30-day comment period occurred from 7 June 209 to 8 July 2019. Registered I&APs identified in the pre-application phase were notified of this comment period via post or email. The written notification provided to the I&APs is included in Appendix B2.

Due to an unforeseen delay during the submission of the finalised reports to the Department of Environmental Affairs, the application for Environmental Authorisation lapsed, and a new application has been lodged with the Department.

Hard and electronic copies were made available to selected organs of state and municipalities based on their internal requirements. I&APs are able to access the BAR on the Aurecon website: http://www.aurecongroup.com/en/public-participation.aspx. Proof of delivery and notification will be provided in Appendix B3 of the final BAR submitted to DEA for decision-making.

5 COMMENTS AND RESPONSES

Table 2 provides responses to all comments received during the February 2019 public comment period. All comments received during the June 2019 public comment period is available in Table 3. Responses have been provided by Aurecon, the applicant, or the wetland specialist (where appropriate). The original comments and responses are available in Appendix B5.

Table 2: I&AP Comments and Responses (11 February to 14 March 2019)

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
	04 February 2019 Email **Interested and Affected Party (Thomas Tshivhandekano)**	I would like to partake in the process for Working for Wetland Programme Basic Assessment at Mutale under Thoyandou town.	EAP: Thank you for your interest in the Working for Wetlands project. This serves to confirm that you have been registered as an Interested and Affected Party (I&AP) for the abovementioned project and will be kept informed during the process. Notification will be sent to all registered I&APs prior to the start date of the Basic Assessment Report (BAR) and project specific rehabilitation plan commenting period.
	12 February 2019 Email and Telephone **Limpopo Department of Economic Development, Environment and Tourism (Foster Baloyi)**	The Department acknowledges receipt of your email received on 11.02.2019 and informs you that as the commenting authority for the proposed project, the Department will only provide comments upon receipt of the reports (hard copies).	EAP: Thank you for your interest in the Working for Wetlands Project. Following our telephonic conversation earlier, this is to confirm that electronic copies (in a CD format) of the Basic Assessment Report have been sent to Mr Meshack Masindi and Mr Vincent Egan of the Limpopo Department of Economic Development, Environment and Tourism (LEDET).
	4 March 2019 Email (letter) **Department of Environmental Affairs – Directorate: Biodiversity Conservation (Thobekile Zungu/ Seoka Lekota)**	The Directorate: Biodiversity Conservation received and evaluated the DBAR and the Rehabilitation plans for South-Baleni B82G wetland system. The following recommendations must be considered: Mitigation measure proposed in the rehabilitation plan must be implemented and adhered to; • Rehabilitation work must be done during low rainfall seasons and soil compaction should be prevented as far as possible; • Implement applicable weirs, infillings and berms to stop on-going erosion and drains within wetlands and encourage sediment trapping;	EAP: The Directorate: Biodiversity Conservation's comments is appreciated. The mitigation measures listed by the Directorate is included in the Soutini-Baleni Rehabilitation Plan, as well as the EMPr.

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		• A permit must be acquired to disturb or remove all the protected and listed plant species on site from relevant authorities; • Alien invasive plant species in and around wetland areas must be removed in terms National Environmental Management: Biodiversity Act (NEM:BA) and Conservation of Agricultural Resources Act (CARA). Follow up-actions for at least five years need to take place and • All re-vegetation must be done with local indigenous plant species as specified by the Provincial Co-ordinator and/or Wetland Ecologist. The overall biodiversity objective is to minimise loss to biodiversity as possible. In order to achieve this objective the above mentioned recommendations must be adhered to.	
	13 March 2019 Email (letter) **Department of Environmental Affairs (Mmamohale Kabasa)**	Comments on the draft Basic Assessment Report for the Working for Wetlands Programme in the Soutini-Baleni wetlands south west of the town of Giyani within the Greater Tzaneen Local Municipality in the Limpopo Province The application for Environmental Authorisation (EA) and draft Basic Assessment Report (BAR) dated February 2019 and received by the Department on 11 February 2019, refer. This letter serves to inform you that the following information must be included to the final BAR: Please ensure that all relevant listed activities are applied for, are specific and that it can be linked to the development activity or infrastructure as described in the project description.	EAP: Descriptions of interventions associated with the relevant listed activities have been updated to refer to interventions included in the associated rehabilitation plan(s). Note that the descriptions are slightly generic to allow for variations of the general intervention type in the rehabilitation plans.
		The wetland areas selected for rehabilitation appear to be located in inaccessible areas with no definite access roads. The applicant must determine whether part of the rehabilitation	EAP: Existing access roads and tracks will be used by vehicles, and where this is not possible, the site will be accessed on foot. There are no current proposals to develop any new access

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		activities will require the construction of access roads and whether this will trigger the applicable listed activities.	roads, and certainly none that will trigger additional Listed Activities.
		If the activities applied for in the application form differ from those mentioned in the final BAR, an amended application form must be submitted. Please note that the Department's application form template has been amended and can be downloaded from the following link https:/Avww.environment.gov.za/documents/forms.	EAP: Where the activities applied for in the submitted application form differ from those tabled in the BAR, then an amended application form will be submitted with the Final BAR, and the most recent amended application form template will be used.
		Please note that Table 4 on pages 7-8 titled "*Listed activities triggered by the proposed Soutini-Baleni"* project includes Activity 24 of Listing Notice 2 (GN R984, as amended). This activity triggers a full scoping and EIA process, and not a Basic Assessment process. The EAP is required to determine the applicability of the activity, and if such activity is triggered, a new application for Environmental Authorisation must be lodged and the Scoping/EIA process be followed for the proposed Soutini-Baleni Wetland Rehabilitation project.	EAP: Listing Notice 2 Activity 24 has been removed from the BAR and will not be part of the application process. The proposed rehabilitation interventions required for the Soutini-Baleni wetland, will not require the removal or extraction of peat or peat soils. The proposed interventions affecting the mires requires the placement of brush on top of the wetlands as protection against grazers. One of the interventions also allows for the establishment of a cattle fence – but again, this will not require any peat or peat soils to be removed or extracted. For more detail on these interventions, please refer to the Soutini-Baleni Rehabilitation Plan.
		Please ensure that comments from all relevant stakeholders are submitted to the Department with the final BAR. This includes but is not limited to the Limpopo Province Department of Economic Development, Environment and Tourism, the Department of Agriculture, Forestry and Fisheries (DAFF), the provincial Department of Agriculture, the Department of Transport, the Greater Giyani Local Municipality, the Mopani District Municipality, the Department of Water and Sanitation (DWS), the South African Heritage Resources Agency (SAHRA), the Endangered Wildlife Trust (EWT), BirdLife SA, the Department of Mineral Resources, the Department of Rural Development and Land Reform, and the Department of	EAP: All I&APs listed by the Department is included in the I&AP database (see Chapter 2 of this document).

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		Environmental Affairs: Directorate Biodiversity and Conservation.	
		Please ensure that all issues raised and comments received during the circulation of the draft BAR from registered |&APs and organs of state which have jurisdiction in respect of the proposed activity are adequately addressed in the final BAR. Proof of correspondence with the various stakeholders must be included in the final BAR. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments.	EAP: Section 5 and Appendix B5 of the PPR include all comments received during the public participation process as well as the responses thereto.
		A Comments and Response trail report (C&R) must be submitted with the final BAR. The C&R report must incorporate all comments for this development. The C&R report must be a separate document from the main report and the format must be in the table format as indicated in Annexure 14 of this comments letter. Please refrain from summarising comments made by I&APs. All comments from I&APs must be copied verbatim and responded to clearly. Please note that a response such as “noted” is not regarded as an adequate response to I&AP’s comments.	EAP: A C&R is provided in section 5 of this document with all original comments received available in Appendix B5.
		The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014 as amended.	EAP: As mentioned in Appendix B-Section 1 of the Public Participation Report, the Public Participation Process has been undertaken in accordance to regulations 39-44 of the EIA Regulations. In addition, however, the Public Participation Report has been rephrased to mention the year of the EIA Regulations, as amended.
		The final BAR must also indicate that this draft BAR has been subjected to a public participation process.	EAP: The final BAR will be updated accordingly.
		The final BAR must indicate clearly the name of the newspaper that the advertisement for the draft BAR has been advertised.	EAP: Chapter 4 of the BAR indicates the name of the newspaper in which the advertisement for the draft BAR was

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
			published, together with dates of publication. Also see Section 3.3 of this document.
		The BAR must provide a clear site layout map at an appropriate scale with an indication of all the envisioned areas along the wetland system that will be subject to rehabilitation. All available biodiversity information must be used in the finalisation of this map. Existing infrastructure must be used as far as possible e.g. roads. The map must indicate the following: • All supporting onsite infrastructure such as laydown area, roads, guard house and buildings, including accommodation etc; • The location of sensitive environmental features on site e.g. CBAs, heritage sites, wetlands, drainage lines etc. that will be affected; • Buffer areas; and • All "no-go" areas.	EAP: A map indicating the wetlands earmarked for rehabilitation is provided in Appendix C of the BAR. The associated rehabilitation plan provides a project description and a locality plan of the proposed interventions, although no supporting infrastructure or accommodation will be required. Please note that the entire site is sensitive since the purpose of the project is to rehabilitate degraded wetlands.
		The paleontological sensitivity map on page 28 (Figure 10) of the draft BAR is not clear. There is no colour distinction to indicate the different sensitivity layers. A revised map must be submitted with the final BAR. The map must show the location of the Soutini-Baleni Wetland System in relation to different sensitivity layers.	EAP: The palaeontological sensitivity map in the BAR has been updated to show the location of the site. Note that the entire mapped area is grey due to its sensitivity rating. Please refer to Appendix C of the BAR and the Soutini-Baleni Rehabilitation Plan which shows the proposed intervention in relation to the no-go areas identified by the heritage specialist.
		It is noted that the Soutini-Baleni Wetland System is a formally declared Natural Heritage Site. Page 10 of the draft BAR indicates that a Heritage Impact Assessment conducted by Mr. Stephen Gaigher has been submitted with the draft BAR as Appendix D. Please note that no such specialist report has been appended to the draft BAR received by the Department on 11 February 2019.	EAP: Apologies, it appears that the Heritage Impact Assessment was accidently not included in the hard copy submission to the Department. Please refer to Appendix D of the revised draft BAR.

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		The Applicant must ensure that the Heritage Impact Assessment referred to under point (i) above; is made available to SAHRA for comment. Recommendations from SAHRA must form part of the EMPr and Rehabilitation Plan Documents.	EAP: Please refer to comments 5 and 6 in this table for SAHRA's interim and final comments on the application.
		The following Important Bird Areas (IBAs) are located within 30km radius of the Soutini-Baleni Wetland System: The Wolkberg Forest Belt (IBA SA005) and the Kruger National Park Border (IBA SA002) that is located approximately 15km from the wetland system. The final BAR must include an avifaunal impact statement from a qualified avifaunal specialist on the possible impacts to any important avifaunal species that may utilise the Soutini-Baleni Wetland System.	EAP: The impact of the proposed wetland rehabilitation activities on biota, including avifauna, is considered by the wetland specialist in his assessment of the wetland status and proposed interventions (attached as Appendix A to the Soutini-Baleni Rehabilitation Plan). Also note that stakeholders such as the Directorate: Biodiversity Conservation did not require an avifauna impact assessment and did not object to the proposed wetland rehabilitation activities.
		The Soutini-Baleni Wetland System is located within an important cultural tourism area. The social impact assessment must also include an assessment of potential impacts on tourism in the area. The report must also include a tourism impact statement.	EAP: The potential impact on tourism and recreation is considered to be limited and is assessed in Section 7.1.10 of the BAR. According to the Wet-Health assessment undertaken by the wetland specialist (see Appendix A of the Soutini-Baleni Rehabilitation Plan), the tourism and recreation value of the wetland is very low, but can be increased significantly by implementing the proposed rehabilitation interventions.
		The following Activities applied for may trigger Section 19; S21 (c) and (i) of the National Water Act No. 36 of 1998: GN R. 983 Activities 12 (i)(ii)(a); 48 (i)(ii)(a); GN R 985 Activities 14 (i)(ii)(a)(c)(e)(i)(ff)(hh), 23 (i)(ii)(a)(c)(e)(i)(ee)(gg). The BAR must include a freshwater specialist study with the following terms of reference: • Desktop mapping of freshwater ecosystems within the Department of Water and Sanitation's (DWS) 500m	EAP: Please note that this is not a development project but rather a rehabilitation project. The wetland is currently degraded and requires the implementation of rehabilitation interventions proposed by the Working for Wetlands Programme to retain and/or improve wetland function and biodiversity. The wetland specialists appointed to this project consider habitat, aquatic ecology and associated wetland fauna and avifauna species. The wetland specialists provide desktop

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		Water Use Licence trigger area around the wetland system; • Field-based assessments of the potentially impacted systems to determine likely impacts and risks that the proposed rehabilitation measures may have on the wetland system. • Fish management method statement for any fish relocations if any. Identify and recommend measures for mitigating impacts on the receiving environment.	mapping of the system in question, undertake field-based assessments which inform the subsequent Rehabilitation Plans, and identify and provide measures for these plans for mitigating any negative impacts for the construction of the interventions. The recommendations towards intervention options are aimed at meeting the wetland rehabilitation objectives set by the specialist, and therefore at improving habitat and opportunity for all reliant species, including aquatic species. A separate freshwater specialist study in addition to that provided by the wetland specialists (see Appendix A of the Soutini-Baleni Rehabilitation Plan) is deemed to be unnecessary in this context. Also note that stakeholders such as the Directorate: Biodiversity Conservation did not require a freshwater impact assessment and did not object to the proposed wetland rehabilitation activities. With regards to the need for a Water Use Licence, please note that in terms of Section 39 of the NWA, a General Authorisation (GA) has been granted for certain activities that usually require a Water Use License; as long as these activities are undertaken for wetland rehabilitation. These activities include *'impeding or diverting the flow of water in a watercourse'* and '*altering the bed, banks, course or characteristics of a watercourse'* where they are specifically undertaken for the purposes of rehabilitating a wetland for conservation purposes. The WfWetlands Programme is required to register the 'water use' in terms of the GA (Government Notice No. 1198 of 18 December 2009).
		The EAP must ensure that the terms of reference (TOR) for all the identified specialist studies must include the following: • A detailed description of the study's methodology; indication of the locations and descriptions of the	EAP: The terms of reference (TOR) for the Wetland Specialist is summarised in Section 3 of the General Methodology of the Rehabilitation Plan. The Wetland Specialist (Retief Grobler)

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		development footprint, and all other associated infrastructures that they have assessed and are recommending for authorisations. • Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the right season and providing that as a limitation will not be allowed. • Please note that the Department considers a 'no-go' area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure including access roads is allowed in the 'no-go' areas. • Should the specialist definition of 'No-go' area differ from the Departments definition: this must be Clearly indicated. The specialist must also indicate the 'no-go' area's buffer if applicable. • All specialist studies must be final, and provide detailed/practical mitigation measures and recommendations, and must not recommend further Studies to be completed post EA. Should specialists recommend specific mitigation measures, these must be clearly indicated.	provided a Phase 2: Status Quo Assessment (Appendix A of the BAR) that included: • A detailed description of the study's methodology (Section 2); an indication of the locations and descriptions of the development footprint (Sections 3 and 5), and all other associated infrastructures that they have assessed and are recommending for authorisations (N/A - this is not a development proposal, interventions are provided in the Intervention Booklet: Appendix C of the Rehabilitation Plans). • A detailed description of all limitations to the study (Section 4). All specialist field work was conducted in the appropriate season. • It is important to note that: • The Specialist's definition of a 'No-Go' area concurs with that of the Departments definition. The specialist was required to indicate any 'No-Go' areas, as well as their buffers, if applicable. • The Phase 2: Status Quo Assessment provided is the Final version. • Detailed/practical mitigation measures and recommendations are provided in the Rehabilitation Plans (EMP) and specific mitigation per intervention (where required) is provided in the Intervention Booklet (Appendix C of the Rehabilitation Plan). • No further studies are required to be completed post EA.
		The EAP must indicate based on the assessment, the specialist assessment conducted and the various engineering methods, which interventions at which locations will be most suited and should be authorised for this project. The mitigation measures and recommendations to be included in EMPr should also be provided by the EAP.	EAP: Please refer to the Soutini-Baleni Rehabilitation Plan for detailed descriptions on the status of the wetlands, the wetland rehabilitation objects as well as the interventions that were deemed to be most appropriate to achieve the identified rehabilitation objectives. Note that the interventions were identified after detailed discussions among the project team members. Also refer to Appendix C for detail on site specific

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
			mitigation measures required for the proposed wetland rehabilitation interventions.
		The BAR, specialist studies and EMPr must ensure compliance to the relevant appendices as outlined in the EIA Regulations, 2014 as amended.	EAP: Please refer to the checklist titled "NEMA Requirements for Basic Assessment Reports" on pages i-iii of the BAR.
		The final BAR must include a copy of the Memorandum of Understanding for Working for Wetlands Programme referred to on page 4 of the draft BAR received on 14 February 2019.	EAP: Please note that the Working for Wetlands Programme was unable to provide a copy of the Memorandum of Understanding. Subsequently, the section has been removed from the BAR.
		The EAP is requested to contact the Department to make the necessary arrangements to conduct a site inspection prior to the submission of the final BAR.	EAP: The Department will be contacted to arrange a site visit.
		Please also ensure that the final BAR includes the period for which the Environmental Authorisation is required and the date on which the activity will be concluded as per Appendix 1 (3)(1)(q) of the NEMA EIA Regulations, 2014, as amended.	EAP: Section 8.2 has been updated in the BAR to provide this information, and the checklist titled "NEMA Requirements for Basic Assessment Reports on pages i-iii has been updated accordingly.
		You are further reminded to comply with Regulation 19(1)(a) of the NEMA EIA Regulations, 2014, as amended, which states that: *"Where basic assessment must be applied to an application, the applicant must, within 90 days of receipt of the application by the competent authority, submit to the competent authority - (a) a basic assessment report, inclusive of specialist reports, an EMPr, and where applicable a closure plan, which have been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority."*	EAP:
			EAP: The Department's reminder is appreciated. An extension in terms of Section 19(1)(b) of the NEMA EIA Regulations,

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		Should there be significant changes or new information that has been added to the BAR or EMPr which changes or information was not contained in the reports or plans consulted on during the initial public participation process, you are required to comply with Regulation 19(b) of the NEMA EIA Regulations, 2014, as amended, which states that: *''the applicant must, within 90 days of receipt of the application by the competent authority, submit to the competent authority - (b) a notification in writing that the basic assessment report, inclusive of specialist reports an EMPr, and where applicable, a closure plan, will be submitted within 140 days of receipt of the application by the competent authority, as significant changes have been made or Significant new information has been added to the basic assessment report or EMPr or, where applicable, a closure plan, which changes or information was not contained in the reports or plans consulted on during the initial public participation process contemplated in subregulation (1)(a) and that the revised reports or, EMPr or, where applicable, a closure plan will be subjected to another public participation process of at least 30 days''.* Should you fail to meet any of the timeframes stipulated in Regulation 19 of the NEMA EIA Regulations, 2014, as amended, your application will lapse.	2014, as amended, has been obtained. Please refer to Appendix B6 [2]for a copy of the letter that was submitted to DEA in this regard.
		You are hereby reminded of Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may commence prior to an Environmental Authorisation being granted by the Department.	EAP: The Department's reminder is noted.

[2] Please note that Appendix B6 has been removed since it is not applicable to the new application process.

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
	18 March 2019 Letter **SAHRA (Nokukhanya Khumalo)**	Working for Wetlands (WfWetlands) is a government programme mandated to protect pristine wetlands, promote their wise-use and rehabilitate those that are damaged throughout South Africa, with an emphasis on complying with the principles of the Expanded Public Works Programme (EPWP) and using only local Small, Medium and Micro Enterprises (SMMEs).Due to the nature of the project, it is important to note that the very objectives of the WfWetlands Programme are to improve both environmental and social circumstances. Working for Wetlands is proposing to rehabilitate the wetland area within the Baleni nature reserve located in the Greater Giyane Local Municipality of the Limpopo Province. They plan on accomplishing this by constructing weirs/gabions that will create a barrier that will allow for sedimentation build-up to slow the water flow and re-wet the wetland area. There will be 28 intervention areas in the wetland including a 325m cattle fence. Aurecon South Africa (Pty) Ltd is undertaking a Basic Assessment process on behalf of Working for Wetlands, in respect of listed activities in the Environmental Impact Assessment (EIA) Regulations 2014, as amended, that require an application for Environmental Authorisation, in terms of the National Environmental Management Act, 1998 (NEMA), as amended. To meet the requirements of section 38(8) of the National Heritage Resources Act, no 25 of 1999, a Heritage Impact Assessment (HIA) Report by G&A Heritage Management Consultants (Pty) Ltd had been submitted to South African Heritage Resources Agency (SAHRA) for commenting. *Gaigher, S. December 2018. Phase 1 Heritage Impact Assessment Report for the Proposed Anti-Erosion Measures*	EAP: SAHRA was informed that the BAR was made available on SAHRIS for comment with the Heritage Impact Assessment Report.

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		at the Baleni Salt Works Provincial Heritage Site, Limpopo Province. The author undertook a field assessment of the proposed wetland area and identified two heritage sites that may be impacted by the proposed intervention areas. The first site, Site 1 in the HIA is the same site that was described in a masters research paper as site BS04; it consists of hut floor remains, ash deposits, and potsherds of which some are diagnostic. This site will be partially impacted by trenching to install intervention measures to curb continued erosion. The author assessed the disturbance as beneficial to the long conservation of other archaeological sites downstream. The second site, Site 2 is a single grave site located outside the proposed rehabilitation intervention areas. Both sites are of high heritage significance. As well as all other sites located within the entire wetland area is the Baleni Salt-works as it is a Provincial Heritage Site (PHS). The author recommends: No assessment of impacts on palaeontological resources because the study area is located in the grey zone in the SAHRA palaeo-map. Site 1 must be mitigated by a qualified archaeologist in the area that will be disturbed by the installation of a gabions at Intervention B82G-01-213-00. In order to carry out the mitigations, a section 35 of the NHRA permit application must be applied for to SAHRA. The cemetery must be protected by a 25 m buffer zone during construction. The Chance Finds procedures provided in the report must be included in the EMPr for all intervention measures as well as the cattle fence construction. Interim Comment	

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit cannot comment on the HIA report until the BAR report is submitted to the case for review.	
	15 April 2019 Letter **SAHRA (Nokukhanya Khumalo)**	Working for Wetlands (WfWetlands) is a government programme mandated to protect pristine wetlands, promote their wise-use and rehabilitate those that are damaged throughout South Africa, with an emphasis on complying with the principles of the Expanded Public Works Programme (EPWP) and using only local Small, Medium and Micro Enterprises (SMMEs).Due to the nature of the project, it is important to note that the very objectives of the WfWetlands Programme are to improve both environmental and social circumstances. Working for Wetlands is proposing to rehabilitate the wetland area within the Baleni nature reserve located in the Greater Giyane Local Municipality of the Limpopo Province. They plan on accomplishing this by constructing weirs/gabions that will create a barrier that will allow for sedimentation build-up to slow the water flow and re-wet the wetland area. There will be 28 intervention areas in the wetland including a 325m cattle fence. Aurecon South Africa (Pty) Ltd is undertaking a Basic Assessment process on behalf of Working for Wetlands, in respect of listed activities in the Environmental Impact Assessment (EIA) Regulations 2014, as amended, that require an application for Environmental Authorisation, in terms of the National Environmental Management Act, 1998 (NEMA), as amended. To meet the requirements of section 38(8) of the National Heritage Resources Act, no 25 of 1999, a Heritage Impact Assessment (HIA) Report by G&A Heritage Management Consultants (Pty) Ltd had been submitted to South African	EAP: SAHRA's comments are appreciated and have been included in the Soutini-Baleni Rehabilitation Plan. The Final BAR and DEA's decision on the application will be uploaded to the case on SAHRIS.

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		Heritage Resources Agency (SAHRA) for commenting on 11/02/2019. In an Interim Comment issued on 18/03/2019, SAHRA summarised the HIA report as follows: *Gaigher, S. December 2018. Phase 1 Heritage Impact Assessment Report for the Proposed Anti-Erosion Measures at the Baleni Salt Works Provincial Heritage Site, Limpopo Province.* *The author undertook a field assessment of the proposed wetland area and identified two heritage sites that may be impacted by the proposed intervention areas. The first site, Site 1 in the HIA is the same site that was described in a Masters research paper as site BS04; it consists of hut floor remains, ash deposits, and potsherds of which some are diagnostic. This site will be partially impacted by trenching to install intervention measures to curb continued erosion. The author assessed the disturbance as beneficial to the long conservation of other archaeological sites downstream.* *The second site, Site 2 is a single grave site located outside the proposed rehabilitation intervention areas. Both sites are of high heritage significance. As well as all other sites located within the entire wetland area is the Baleni Salt-works as it is a Provincial Heritage Site (PHS).* *The author recommends:* *No assessment of impacts on palaeontological resources because the study area is located in the grey zone in the SAHRA palaeo-map.* *Site 1 must be mitigated by a qualified archaeologist in the area that will be disturbed by the installation of a gabions at Intervention B82G-01-213-00. In order to carry out the*	

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		mitigations, a section 35 of the NHRA permit application must be applied for to SAHRA. *The cemetery must be protected by a 25 m buffer zone during construction.* *The Chance Finds procedures provided in the report must be included in the EMPr for all intervention measures as well as the cattle fence construction.* *SAHRA could not process the case to its conclusion until the accompanying environmental documents (BAR and appendices) were submitted to the case. The BAR has since been submitted and within section 7.1.4, it states that an archaeological excavation must be undertaken for site at 23°25'13" S 30°54'52" E (under a permit issued by SAHRA). The grave site at 23°25'13" S30°54'52" E will not be directly impacted but it may be impacted indirectly by construction activities. A buffer of 25 m radius must be applied to the grave site as a no-go area.* *Final Comment* *The South African Heritage Resources Agency (SAHRA) Archaeology, Palaeontology and Meteorites (APM) Unit accepts the recommendations provided in the HIA report however, the buffer zone around the grave must be increased to 30m.* The following additional recommendations must also be included as part of the EMPr for implementation during construction: • An archaeologist must be appointed to undertake a weekly monitoring programme of all construction	

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		activities and develop a heritage training manual for the induction of the construction crew and ECO. • All access points to the construction site, construction camps, laydown areas and stockpile areas must be assessed by an archaeologist prior to the construction phase. A report of the walk down assessment must be submitted to SAHRA. • Once the design of the weir is finalised the potential extent of flooding must be determined and the potential impacts to the surrounding heritage sites must be assessed. This assessment must be included in the walk-down report. • A CMP must be developed from the findings of this assessment, the CMP must also address any monitoring measures required for the long-term maintenance of the weirs. • In the unlikely event that fossils are uncovered during construction then construction must cease within the immediate vicinity, a buffer of 30 m must be established, and a palaeontologist called in to inspect the finds. The palaeontologist must obtain a section 35(4) permit in terms of NHRA and Chapter IV NHRA Regulations, before any fossils are collected. • If there are any new heritages resources are discovered during construction and operation phases of the proposed development, then a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings at the expense of the developer. • If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required at the expense of the developer. Mitigation will only be carried out after the archaeologist or palaeontologist obtains a permit in terms of section 35 of the NHRA (Act 25 of 1999). You may	

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		contact SAHRA APM Unit for further details: (Nokukhanya Khumalo/Phillip Hine 021 202 8654). • If any unmarked human burials are uncovered and the archaeologist called in to inspect the finds and/or the police find them to be heritage graves, then mitigation may be necessary and the SAHRA Burial Grounds and Graves (BGG) Unit must be contacted for processes to follow (Thingahangwi Tshivase/Mimi Seetelo 072 802 1251). The Final BAR and its appendices must be uploaded to the case on SAHRIS. Once a decision on the EA application is reached, the record of decision must be uploaded to the case on SAHRIS. Should you have any further queries, please contact the designated official using the case number quoted above in the case header.	

Table 3: I&AP Comments and Responses (7 June 2019 – 8 July 2019)

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
	07 June 2019 Email **Department of Water and Sanitation (Dr Wietsche Roets)**	You are mentioning the GA1198 in your document, please ensure that you comply to the requirements set out in GA1198 and submit relevant registration documents to the relevant regional operations of DWS.	EAP: Thank you for your comment. The necessary General Authorisation approval process will be undertaken by the applicant.
	07 June 2019 Email **Department of Water and Sanitation (Pieter Ackerman)**	My comments include: 1. Hydrological and ecological connectivity must be catered for in the designs.	EAP: The rehabilitation objectives for the WfWetlands planning are to secure and improve the overall integrity of the systems, particularly focusing on maintaining and improving the hydrological conditions where possible. In turn the overall functioning of the systems and the conditions that support a range of wetland dependent fauna and flora will be secured and enhanced. During the planning phase, the wetland specialists assess the ecological status and characteristics of the wetland in terms of the Wet-Health methodology, taking into consideration hydrology, geomorphology, terrestrial ecology and vegetation). The findings of this assessment are then used to determine the rehabilitation objectives for the wetland as well as the most appropriate design intervention to achieve these objectives. The key purposes of implementing design interventions also include restoring hydrological integrity, raising the general water table and redistributing water across the wetland area and recreating wetland habitats towards the conservation of biodiversity.
		2. It must be monitored if and how the ecological category changed after rehabilitation. PES of category D to PES of B.	EAP: The monitoring and evaluation of the wetland systems relies on collecting relevant baseline information, with collected data including fixed point photographs. It also includes the number of wetlands rehabilitated, number of HGM units rehabilitated, hectare equivalent gained, and area secured. The Present Ecological State (PES) assessments compares

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
			current changes to the expected natural wetland properties. The ecological integrity or PES of the Wetlands were assessed based on perceived modifications to wetland hydrology, geomorphology and vegetation. These components of the ecological integrity of the wetland were assessed for the current status quo and post-rehabilitation.
		3. Scientific buffers must be included taking into account hydropedological flow drivers in the landscape	EAP: The wetland assessments undertaken by the wetland specialists are in accordance with the methodology prescribed by WET-EcoServices and WET-Health assessment techniques, which consider Hydrological, geomorphological and vegetation drivers. In addition, Ecological Importance and Sensitivity (EIS) assessments were also undertaken (see Section 2.1 of the Wetland Status Quo Assessments; Annexure A of the rehabilitation plans). Specifically, these assessments consider (amongst others): • Regulatory and supporting benefits (including flood attenuation, streamflow regulation and water quality); • Biodiversity maintenance benefits; • Ecological importance and sensitivity; • Hydro-functional importance; • Wetland hydrology; • Wetland geomorphology and • Structural and compositional state of the vegetation.
		4. A guideline with concept designs must be compiled on how wetlands and pans can be re-created taking into account destruction of pans by mines.....OR a clear statement that the recreation is not possible in most cases.....In which cases can it work.	EAP: Your request has been forwarded to the Working for Wetlands management team to be addressed separately from the Basic Assessment process.

No.	Date of comment, format of comment, name of organisation/ I&AP	Comment	Response from EAP/ Applicant/ Specialist
		5. A guideline with concept designs for constructed wetlands.	EAP: Your request has been forwarded to the Working for Wetlands management team to be addressed separately from the Basic Assessment process.
		6. Lessons learned	EAP: Wetland assessments are carried out in accordance with WET-Rehab-Evaluate, which include monitoring and evaluation facilitating the dissemination of lessons learnt and provide a means of reporting on the success of specific wetland rehabilitation initiatives. The monitoring and evaluation (M&E) of an identified wetland rehabilitation project's performance is therefore considered vital to inform the evaluation of wetland rehabilitation success.
		7. Re-introduction of plants and animals must be taken into account	EAP: The Wetland rehabilitation objectives consider the recreation of wetland habitat towards the conservation of biodiversity, which includes the re-introduction of plants.
		8. Environmental awareness training for protection of the system in future.	EAP: Noted. Other activities that form part of the WfWetlands programme include raising awareness of wetlands among landowners, workers and general public, providing education and training, and technical skills transfer. This involves capacity building through education and training community members who would monitor the progress of rehabilitated wetlands.
		9. Follow ups	EAP: During Phase 3 of the planning process, constructed interventions are visited by the Working for Wetlands Provincial Coordinator to monitor the functioning of the intervention and to determine if any maintenance is required. Follow-up visits are also required in terms of the monitoring and evaluation process that the Programme applies.

6 WAY FORWARD

Following the 30-day public comment period, the BAR will be updated by incorporating any I&AP comments received on the reports (where relevant). All comments will be recorded and responded to in this PPR which will be circulated to all who have provided comment. The updated BAR will then be submitted to DEA for their decision-making process. Once DEA has made their decision on the proposed project, all registered I&APs will be notified of the outcome of the decision within fourteen (14) calendar days of the decision and the right to appeal projects.

7 Appendices

Appendix B1 | DEA Meeting Minutes

Appendix B2 | Landowner Agreement(s)

Appendix B3 | Written Notification

Appendix B4 | Proof of Delivery

Appendix B5 | Comments

Appendix B1

DEA PRE-APPLICATION MEETING MINUTES

Aurecon South Africa (Pty) Ltd
Reg No 1977/003711/07

Aurecon Centre
1 Century City Drive
Waterford Precinct
Century City
Cape Town 7441

PO Box 494
Cape Town 8000
South Africa

T +27 21 526 9400
F +27 21 526 9500
E capetown@aurecongroup.com
W aurecongroup.com

Meeting Record

Project number	**113223**	Meeting date	**2019-08-14**
Project name	**Working for Wetlands Pre-application meeting: DEA**	Recorded by	**NX**
Meeting/subject	**Meeting minutes**	Total pages	**2**

Present	Apology	Copy	Name	Organisation	Contact details
☑	☐	☐	Coenrad Agenbach (CA)	DEA	cagenbach@environment.gov.za
☑	☐	☐	Dakalo Netshiombo	DEA	DNetshiombo@environment.gov.za
☑	☐	☐	Fiona Grimett (FG)	DEA	FGrimett@environment.gov.za
☑	☐	☐	Makhosazane Yeni (MY)	DEA	MYeni@environment.gov.za
☑	☐	☐	Mmamohale Kabasa (MK)	DEA	MKabasa@environment.gov.za
☑	☐	☐	Mpho Monyai (MM)	DEA	MMonyai@environment.gov.za
☑	☐	☐	Thando Booi (TB)	DEA	TBooi@environment.gov.za
☑	☐	☐	Thulisisle Nyalunga (TN)	DEA	TNyalunga@environment.gov.za
☑	☐	☐	Zesipho Makhosayafana (ZM)	DEA	Zmakhosayafana@environment.gov.za
☑	☐	☐	Franci Gresse (FGr)	Aurecon South Africa (Pty) Ltd	Franci.Gresse@aurecongroup.com
☑	☐	☐	Noluyolo Xorile (NX)	Aurecon South Africa (Pty) Ltd	Noluyolo.Xorile@aurecongroup.com

The following key notes provide a record of the meeting that took place at the Department of Environmental Affairs (DEA) in Pretoria at 10:00 am on Wednesday, 14 August 2019:

1. Purpose and Background

- A meeting with DEA was requested to discuss the re-application process requirements for the following Working for Wetlands projects: Eastern Cape, Gauteng, KwaZulu-Natal and Limpopo.
- The submission deadline of the Final Basic Assessment Reports for these projects were missed and the applications lapsed in June 2019.

2. Application Process Requirements

- DEA indicated that the Environmental Impact Assessment Regulation (Government Notice Regulation (GN R) 982 of 4 December 2014), as amended, does not allow for a re-application process for Basic Assessment application. The Department will thus consider these projects as new applications in terms of the Regulations. All requirements in terms of the Regulations for a Basic Assessment application must be followed.
- A copy of the key notes from the Pre-application meeting must be submitted to the Department with the application forms.

- **Public Participation Process Requirements**
- Basic Assessment Reports were made available to the public twice during the original application process. No objections were received against the proposed rehabilitation projects.
- All Basic Assessment Reports must be made available for a 30-day public comment period during which time DEA will also provide comment.
- Comments received during the original application process from the Department should be addressed in the reports. Motivations must be provided when it is felt that comments are not applicable to the project.
- The option to use posters and adverts from the original application process was discussed. It was noted that the Regulations does not indicate timeframes within which these must be placed. It also does not require DEA's reference numbers to be shown on them.
- FGr was requested to send an email to IQ to determine if it is acceptable to use the posters and adverts from the original application process. Case officers should be copied in the email to IQ.

3. Timeframes

- A request to DEA IQ will be send by Friday, 16 August at the latest.
- Key notes from the meeting will be distributed to DEA as soon as possible.
- DEA requested that the key notes be distributed by Monday 26 August if Aurecon is unable to send it by Friday, 16 August since they will be at the IAIAsa conference.

4. Site Visits

- Case officers will decide whether a site visit is needed after reviewing the Draft Basic Assessment Reports. If the case officers are of the opinion that the site is sensitive and/or are unclear about the content of the document, a site visit will be requested.
- It was requested that site visit requests be communicated to Aurecon as soon as possible (i.e. before the end of the public comment period if possible) to start with preparations for site visits and to clear diaries with the Provincial Coordinators to accompany the case officers to site.
- DEA confirmed that an agreement was reached with Millicent Solomons that the Working for Wetlands' (WfWetlands) Provincial Coordinators may accompany the case officers to site instead of the Environmental Assessment Practitioner.
- DEA indicated that a site visit to a rehabilitated wetland would be beneficial to assist the case officer with familiarising themselves with the interventions that are used by WfWetlands.

5. Way Forward

- Meeting minutes will be circulated to all attendees for review and approval.
- Aurecon will submit a query to DEA IQ regarding the use of the posters and adverts from the previous application process.

WORKING FOR WETLANDS: CONTEXT DOCUMENT

1. Introduction

Working for Wetlands (WfWetlands) is a government programme managed by the Natural Resource Management Programme (NRMP) of the Department of Environmental Affairs, and is a joint initiative with the Departments of Water and Sanitation (DWS), and Agriculture, Forestry and Fisheries (DAFF). In this way the programme is an expression of the overlapping wetland-related mandates of the three parent departments, and besides giving effect to a range of policy objectives, it also honours South Africa's commitments under several international agreements, especially the Ramsar Convention on Wetlands.

The programme is mandated to protect pristine wetlands, promote their wise-use and rehabilitate those that are damaged throughout South Africa, with an emphasis on complying with the principles of the Expanded Public Works Programme (EPWP) and using only local Small, Medium and Micro Enterprises (SMMEs). The EPWP seeks to draw significant numbers of unemployed people into the productive sector of the economy, gaining skills while they work and increasing their capacity to earn an income.

2. Wetlands and their importance

Once considered valueless wastelands that needed to be drained or converted to more useful land use purposes, wetlands are now seen in an entirely different light. Today wetlands are more commonly perceived as natural assets and natural infrastructure able to provide a range of products, functions and services free of charge.

That which actually constitutes a wetland is often not fully understood. Common misconceptions have been that wetlands must be wet, must have a river running through them, or must always be situated in low-lying areas. The definition of a wetland is much broader and more textured: they are characterised more by soil properties and flora than by an abundance of water.

The National Water Act, No. 36 of 1998 defines a wetland as:

> "*land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil*".

The Ramsar Convention defines wetlands as:

> "*areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6m*" (Article 1, Ramsar Convention on Wetlands. 1971).

Wetlands can therefore be seasonal and may experience regular dry spells (sometimes even staying dry for up to several years), or they can be frequently or permanently wet. Wetlands can occur in a variety of locations across the landscape (**Plate A**), and may even occur at the top of a hill, nowhere near a river. A pan, for example, is a wetland which forms in a depression. Wetlands also come in many sizes; they can be as small as a few square metres (e.g. at a low point along the side of a road) or cover a significant portion of a country (e.g. the Okavango Delta).

Plate A: A large, seasonal wetland identifiable by the characteristic flora. This wetland contained no surface water at the time of the photograph

Wetland ecosystems provide a range of ecological and social services which benefit people, society and the economy at large:

- Improving the ecological health of an ecosystem by performing many functions that include flood control, water purification, sediment and nutrient retention and export, recharge of groundwater, as well as acting as vital habitats for diverse plant and animal species.
- Providing ecological infrastructure replacing the need for municipal infrastructure by providing the same or better benefit at a fraction of the cost, for example:
    - The movement of water in the landscape is slowed down by wetlands, which offers the dual benefit of flood control as well as a means of purification.
    - The slow movement of water allows heavier impurities to settle and phreatic vegetation and micro-bacteria the opportunity to remove pollutants and nutrients.
- Functioning as valuable open spaces and create recreational opportunities for people that include hiking along wetlands, fishing, boating, and bird-watching.
- Having cultural and spiritual significance for the communities living nearby. Commercially, products such as reeds and peat are also harvested from wetlands (**Plate B**).

Plate B: Commercial products made by locals from reeds harvested from wetlands

Wetlands are thus considered to be critically important ecosystems as they provide both direct and indirect benefits to the environment and society.

3. Wetland degradation

It has been estimated that originally over 10% of the Republic of South Africa (RSA) was covered by wetlands. However, this figure decreases significantly every year owing to unsustainable land-use practices. It is estimated that more than 50% of South Africa's wetlands have been destroyed through drainage of wetlands for crops and pastures, poorly managed burning regimes, overgrazing, disturbances to wetland soils, vegetation clearing as well as industrial and urban development (including mining activities).

Although wetlands are high-value ecosystems that make up only a small fraction of the country, they rank among the most threatened ecosystems in South Africa. According to a recent Council of Scientific Research (CSIR) study (Nel and Driver, 2012), South Africa's remaining wetlands were identified as the most threatened of all South Africa's ecosystems, with 48% of wetland ecosystem types being critically endangered, 12% endangered and 5% vulnerable. Only 11% of wetland ecosystem types are well protected, with 71% not protected at all.

The remaining wetland systems suffer from severe erosion and sedimentation, undesirable plant species and aquatic fauna infestations, unsustainable exploitation, artificial drainage and damming, and pollution. The continued degradation of wetlands will impact on biodiversity, ecological function, and the provision of ecosystem services with subsequent impacts on livelihoods and economic activity, as well as health and wellbeing of communities. In the absence of functional wetlands, the carbon cycle, the nutrient cycle and the water cycle would be significantly altered, mostly detrimentally.

Wetland conservation and rehabilitation should be at the heart of water management. It is necessary to prioritise South Africa's remaining wetlands such that those that offer valuable ecosystem services and are least impacted by current pressures or threats are offered immediate attention to avoid further loss, conversion or degradation.

4. The Working for Wetlands Programme

South Africa is a dry country, but is endowed with exceptionally rich biodiversity. The nation has a pressing reason to value the water-related services that wetlands provide. It is estimated that by 2025, South Africa will be one of fourteen African countries classified as "*subject to water scarcity*" (UNESCO, 2000). The conservation of wetlands is fundamental to the sustainable management of water quality and quantity, and wetland rehabilitation is therefore essential to conserving water resources in South Africa.

The guiding principles of the National Water Act, No. 36 of 1998, recognise the need to protect water resources. In responding to the challenge of stemming the loss of wetlands and maintaining and enhancing the benefits they provide, government has recognised that, in order to be truly effective, strategies for wetland conservation need to include a combination of proactive measures for maintaining healthy wetlands, together with interventions for rehabilitating those that have been degraded. These objectives are currently being expressed in a coordinated and innovative way through the WfWetlands Programme.

Working for Wetlands pursues its mandate of wetland protection, wise use and rehabilitation in a manner that maximises employment creation, supports small emerging businesses, and transfers skills amongst vulnerable and marginalised groups. In the 13 years since 2004, the WfWetlands Programme has invested just under R1 billion in wetland rehabilitation and has been involved in over 1,300 wetlands, thereby improving or securing the health of over 70 000 hectares of wetland environment. The WfWetlands Programme has a current budget of just over R 130 million, of which approximately 35% is allocated directly to paying wages. Being part of the EPWP, the WfWetlands Programme has created more than 27 000 jobs and over 3 million person-days of paid work. The local teams are made up of a minimum of 55% women, 55% youth and 2% disabled persons.

Wetlands are not easy ecosystems to map at a broad scale as they are numerous, often small and difficult to recognise and delineate on remotely sensed imagery such as satellite photos. The WfWetlands Programme houses the National Wetlands Inventory Project (NWI) which aims to provide clarity on the extent, distribution and condition of South Africa's wetlands. The project clarifies how many and which rivers and wetlands have to be maintained in a natural condition to sustain economic and social development, while still conserving South Africa's freshwater biodiversity.

The National Freshwater Ecosystem Priority Areas (NFEPA) has used the NWI data to produce the most comprehensive national wetland map to date, called the NFEPA Atlas. This atlas enables the planning of wetland rehabilitation on a catchment scale.

Other activities that form part of the WfWetlands Programme include:

- Raising awareness of wetlands among workers, landowners and the general public; and
- Providing adult basic education and training, and technical skills transfer (in line with the emphasis of the EPWP on training, the WfWetlands Programme has provided 250,000 days of training in vocation and life skills).

5. Rehabilitation interventions

The successful rehabilitation of a wetland requires that the cause of damage or degradation is addressed, and that the natural flow patterns of the wetland system are re-established (flow is encouraged to disperse rather than to concentrate). Approximately 800 interventions are implemented every year in the WfWetlands Programme. The key purposes of implementing interventions include:

- Restoration of hydrological integrity (e.g. raising the general water table or redistributing the water across the wetland area);
- Recreation of wetland habitat towards the conservation of biodiversity; and
- Job creation and social upliftment.

Typical activities undertaken within the projects include:

- Plugging artificial drainage channels created by development or historical agricultural practices to drain wetland areas for other land use purposes;

- Constructing structures (gabions, berms, weirs) to divert or redistribute water to more natural flow paths, or to prevent erosion by unnatural flow rates that have resulted from unsustainable land use practices or development; and
- Removing invasive alien or undesirable plant species from wetlands and their immediate catchments (in conjunction with the Working for Water initiative).

Methods of wetland rehabilitation may include hard engineering interventions such as:

- Earth berms or gabion systems to block artificial channels that drain water from or divert polluted water to the wetland;
- Concrete and gabion weirs to act as settling ponds, to reduce flow velocity or to re-disperse water across former wetland areas thereby re-establishing natural flow paths;
- Earth or gabion structure plugs to raise channel floors and reduce water velocity;
- Concrete or gabion structures to stabilise head-cut or other erosion and prevent gullies;
- Concrete and/or reno mattress strips as road crossings to address channels and erosion in wetlands from vehicles; and
- Gabion structures (mattresses, blankets or baskets) to provide a platform for the growth of desired wetland vegetation.

Soft engineering interventions also offer successful rehabilitation methods, and the following are often used together with the hard engineering interventions:

- The use of biodegradable or natural soil retention systems such as eco-logs, Macmat-R plant plugs, grass or hay bales, and brush-packing techniques;
- The re-vegetation of stabilised areas with appropriate wetland and riparian plant species;
- Alien invasive plant clearing, which is an important part of wetland rehabilitation (this is supported by the Working for Water Programme).
- The fencing off of sensitive areas within the wetland to keep grazers out and to allow for the re-establishment of vegetation;
- In some instances, the use of appropriate fire management and burning regimes. The removal of undesirable plant and animal species; and
- In some wetlands, it may be possible to involve the community to develop a management plan for wise use within a wetland. This can involve capacity building through educating and training the community members who would monitor the progress. A plan could involve measures such as rotational grazing with long term benefits for rangeland quality.

6. Programme, projects and phases

In order to manage the **WfWetlands Programme**, wetlands have been grouped into “projects”, and each **Wetland Project** encompasses several smaller wetland systems which are each divided into smaller, more manageable and homogenous wetland units. A Wetland Project may be located within one or more quaternary catchments within a Province. The WfWetlands Programme is currently managing 37 Wetland Projects countrywide, and rehabilitation activities range from stabilising degradation to the more ambitious restoration of wetlands to their original conditions.

Each Wetland Project is managed in three phases (as shown in the flow diagram in **Plate C**) over a two-year cycle. The first two phases straddle the first year of the cycle and involve planning, identification, design and authorisation of interventions. The third phase is implementation, which takes place during the second year.

In order to undertake these three phases, a collaborative team has been established as follows. The **Programme Team** currently comprises two subdirectories: a) Implementation and After Care and b) Planning, Monitoring and Evaluation. The Assistant Directors for Wetlands Programmes (ASDs) [1] report to the Implementation and After Care Deputy Director and are responsible for the identification and implementation of projects in their regions. The Programme Team is further supported by a small team that fulfil various roles such as Geographical Information Systems (GIS) and training. Independent Design Engineers and Environmental Assessment Practitioners (EAPs) are appointed to undertake the

[1] Previously referred to as Provincial Coordinators (PCs).

planning, design and authorisation components of the project. The project team is assisted by a number of wetland specialists who provide scientific insight into the operation of wetlands and bring expert and often local knowledge to the project teams. They are also assisted by the landowners and implementers who have valuable local knowledge of these wetlands.

The first phase is the identification of suitable wetlands which require intervention. The purpose of Phase 1 and the associated reporting is to identify:

- Priority catchments and associated wetlands/ sites within which rehabilitation work needs to be undertaken; and
- Key stakeholders who will provide meaningful input into the planning phases and wetland selection processes, and who will review and comment on the rehabilitation proposals.

Phase 1 commences with a catchment and wetland prioritisation process for every province. The Wetland Specialist responsible for a particular province undertakes a desktop study to determine the most suitable wetlands for the WfWetlands rehabilitation efforts. The involvement of Provincial Wetland Forums and other key stakeholders is a critical component of the wetland identification processes since these stakeholders are representative of diverse groups with shared interests (e.g. from government institutions to amateur ecological enthusiasts). This phase also involves initial communication with local land-owners and other Interested and Affected Parties (I&APs) to gauge the social benefits of the work. Aerial surveys of the areas in question may be undertaken, as well as limited fieldwork investigations or site visits to confirm the inclusion of certain wetland projects or units. Once wetlands have been prioritised and agreed on by the various parties, specific rehabilitation objectives are determined for each wetland following a rapid wetland assessment undertaken by the Wetland Specialist.

Phase 2 requires site visits attended by the fieldwork team comprising a Wetland Specialist, a Design Engineer, an EAP, and an ASD. Other interested stakeholders or authorities, landowners and in some instances the Implementing Agents (IAs) may also attend the site visits. This allows for a highly collaborative approach, as options are discussed by experts from different scientific disciplines, as well as local inhabitants with deep anecdotal knowledge. While on site, rehabilitation opportunities are investigated. The details of the proposed interventions are discussed, some survey work is undertaken by the engineers, and Global Positioning System (GPS) coordinates and digital photographs are taken for record purposes. Furthermore, appropriate dimensions of the locations are recorded in order to design and calculate quantities for the interventions. At the end of the site visit the rehabilitation objectives together with the location layout of the proposed interventions are agreed upon by the project team.

During Phase 2, monitoring systems are put in place to support the continuous evaluation of the interventions. The systems monitor both the environmental and social benefits of the interventions. As part of the Phase 2 site visit, a maintenance inventory of any existing interventions that are damaged and/or failing and thus requiring maintenance is compiled by the ASD, in consultation with the Design Engineer.

Based on certain criteria and data measurements (water volumes, flow rates, and soil types); the availability of materials such as rock; labour intensive targets; maintenance requirements etc., the interventions are then designed. Bills of quantity are calculated for the designs and cost estimates made. Maintenance requirements for existing interventions in the assessed wetlands are similarly detailed and the costs calculated. The Design Engineer also reviews and, if necessary, adjusts any previously planned interventions that are included into the historical Rehabilitation Plans.

Phase 2 also comprises a reporting component where Rehabilitation Plans are prepared for each Wetland Project. The Rehabilitation Plans include details of each intervention to be implemented, preliminary construction drawings and all necessary documentation required by applicable legislation. The Rehabilitation Plans are reviewed by various government departments, stakeholders and the general public before a specific subset of interventions are selected for implementation.

Landowner consent is an important component of each phase in each Wetland Project. The flow diagram, **Plate C**, demonstrates the point at which various consent forms must be approved via signature from the directly affected landowner. The ASDs are responsible for undertaking the necessary landowner engagement and for ensuring that the requisite landowner consent forms required as part of Phase 1 and 2 of this project are signed.

These include:

- WW(0): Standard operating procedure,
- WW(1): Wetland survey and Inspection consent,
- WW(2): Terms and Conditions for carrying out wetland rehabilitation,
- WW(3): Wetland Rehabilitation Activities Consent,
- WW(4): Property Inspection Prior to Wetland Rehabilitation, and
- WW(5): Notification of Completion of Rehabilitation.

Without these signed consent forms the WfWetlands Programme will not be able to implement rehabilitation interventions on the affected property.

Phase 3 requires that certain Environmental Authorisations are obtained before work can commence in the wetlands (please see subsequent sections of this document for detail on Environmental Authorisations). Upon approval of the wetland Rehabilitation Plans by DEA, the work detailed for the project will be implemented within a year with on-going monitoring being undertaken thereafter. The Rehabilitation Plans are considered to be the primary working document for the implementation of the project via the construction/ undertaking of interventions[2] listed in the Plan.

It is typically at this point in the process when the final construction drawings are issued to the IAs. IAs are currently employed in the WfWetlands Programme and are responsible for employing contractors and their teams (workers) to construct the interventions detailed in each of the Rehabilitation Plans. For all interventions that are based on engineering designs (typically hard engineered interventions), the Design Engineer is required to visit the site before construction commences to ensure that the original design is still appropriate in the dynamic and ever-changing wetland system. The Design Engineer will assist the IAs in pegging and setting-out interventions. The setting-out activities often coincide with the Phase 1 activities for the next planning cycle. Phase 3 concludes with the construction of the interventions, but there is an on-going monitoring and auditing process that ensures the quality of interventions, the rectification of any problems, and the feedback to the design team regarding lessons learnt.

[2] This could include soft options such as alien clearing or eco-logs, as well as hard structures for example weirs.

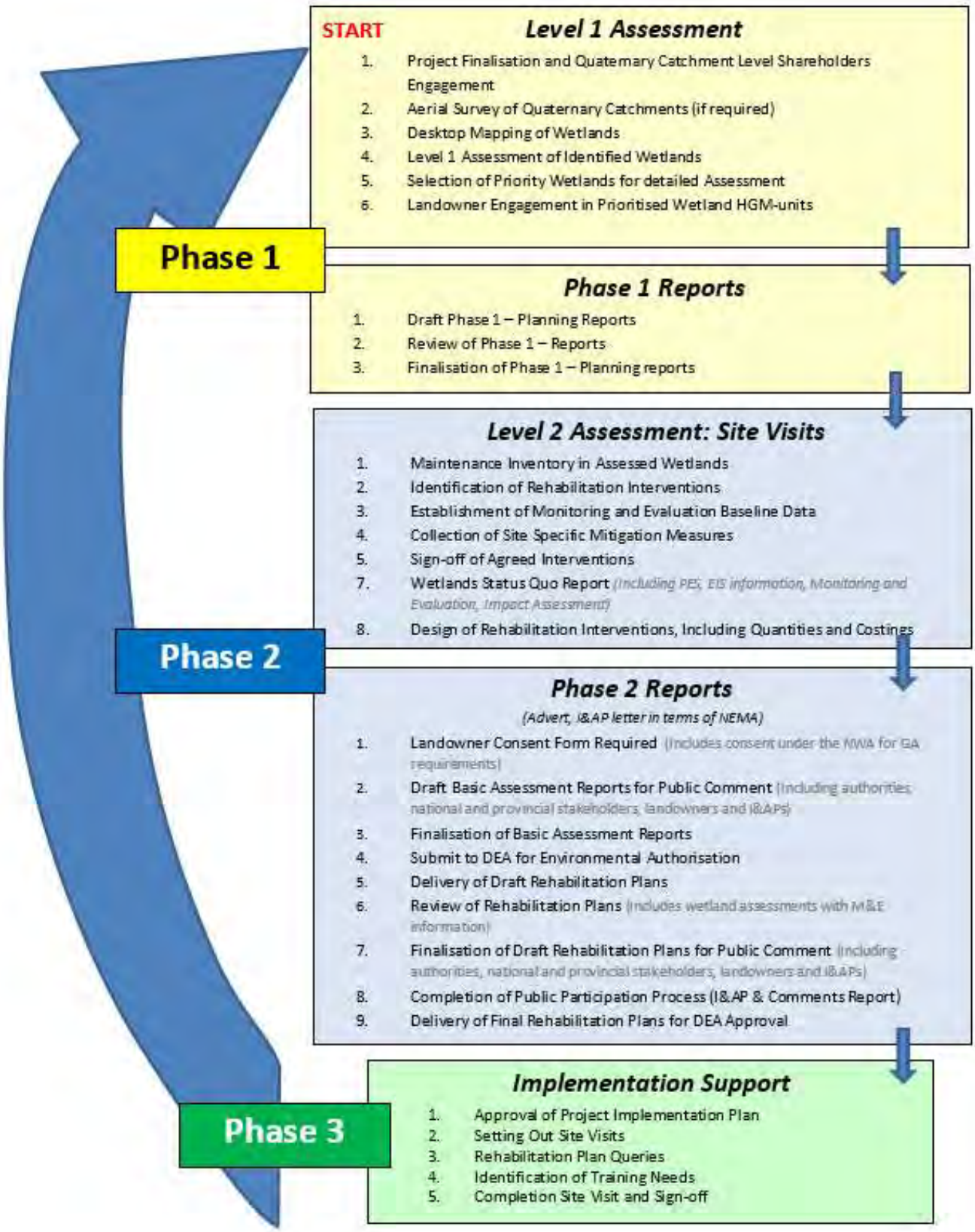


Plate C: The Working for Wetlands planning process (Phase 1 to Phase 3)

Rehabilitation work within floodplain systems

Based on lessons learnt and project team discussions held during the National Prioritisation workshop in November 2010 the WfWetlands Programme took an in-principle decision regarding work within floodplain systems.

Recognising the ecosystem services provided by floodplain wetlands and the extent to which they have been transformed, WfWetlands do not intend to stop undertaking rehabilitation work in floodplains entirely. Instead, WfWetlands propose to adopt an approach to the rehabilitation of floodplain areas that takes into account the following guiding principles:

a) As a general rule, avoid constructing hard interventions within an active floodplain channel; and rather
b) Explore rehabilitation opportunities on the floodplain surface using smaller (possibly more) softer engineering options outside of the main channel.

When rehabilitation within a floodplain setting is being contemplated, it will be necessary to allocate additional planning resources, including the necessary specialist expertise towards ensuring an adequate understanding of the system and appropriate design of the interventions.

7. Environmental legislation

One of the core purposes of the WfWetlands Programme is the preservation of South Africa's valuable wetland systems through rehabilitation and restoration.

South Africa has rigorous and comprehensive environmental legislation aimed at preventing degradation of the environment, including damage to wetland systems. The following legislation is of relevance:

- The National Environmental Management Act, No. 107 of 1998 (NEMA), as amended
- The National Water Act, No.36 of 1998 (NWA)
- The National Heritage Resources Act, No. 25 of 1999 (NHRA)

Development proposals within or near any wetland system are subject to thorough bio-physical and socio-economic assessment as mandatory processes of related legislation. These processes are required to prevent degradation of the environment and to ensure sustainable and environmentally conscientious development.

The WfWetlands Programme requires that both hard and soft interventions are implemented in the wetland system, and it is the activities associated with the construction of these interventions that triggers requirements for various authorisations, licenses or permits. However, it is important to note that the very objective of the WfWetlands Programme is to improve both environmental and social circumstances. The WfWetlands Programme gives effect to a range of policy objectives of environmental legislation, and also honours South Africa's commitments under several international agreements, especially the Ramsar Convention on Wetlands.

Memorandum of Understanding for Working for Wetlands Programme

A Memorandum of Understanding (MoU) has been entered into between DEA, DAFF and DWS for the WfWetlands Programme. Through co-operative governance and partnerships, this MoU aims to streamline the authorisation processes required by the National Environmental Management Act (Act 107 of 1998), the National Water Act (Act 36 of 1998), and the National Heritage Resources Act (Act 25 of 1999) to facilitate efficient processing of applications for authorisation of wetland rehabilitation activities.

Table A: List of applicable legislation

Title of legislation, policy or guideline	Administering authority	Date
The Constitution of South Africa, Act No.108 of 1996	National Government	1996
National Environmental Management Act, No.107 of 1998	Department of Environmental Affairs	1998
The National Water Act, No. 36 of 1998	Department of Water and Sanitation	1998
Conservation of Agricultural Resources Act, No. 43 of 1983	Department of Agriculture, Forestry & Fisheries	1983
National Heritage Resources Act, No. 25 of 1999	National Heritage Resources Agency	1999
World Heritage Conventions Act, No. 49 of 1999	Department of Environmental Affairs	1999
The National Environmental Management: Biodiversity Act, No. 10 of 2004	Department of Environmental Affairs	2004
National Environmental Management: Protected Areas Act, No. 57 of 2003	Department of Environmental Affairs	2003
The Mountain Catchments Areas Act, No. 63 of 1970	Department of Water and Sanitation	1970
EIA Guideline Series, in particular: • Guideline 5 – Companion to the NEMA EIA Regulations, 2010 (DEA, October 2012) • Guideline 7 – Public Participation in the EIA process, 2012 (DEA, October 2012) • Guideline 9 - Guideline on Need and Desirability, 2010 (DEA, October 2014) • DEA&DP. 2013. Guideline on Public Participation (DEA&DP, March 2013). • DEA&DP. 2013. Guideline on Alternatives (DEA&DP, March 2013).	Department of Environmental Affairs	2012 - 2014
International Conventions, in particular: • The Ramsar Convention • Convention on Biological Diversity • United Nations Conventions to Combat Desertification • New Partnership for Africa's Development (NEPAD) • The World Summit on Sustainable Development (WSSD)	International Conventions	N/A

Of particular relevance in **Table A** is the following legislation and the WfWetlands Programme has put systems in place to achieve compliance:

- The National Environmental Management Act, No. 107 of 1998 (NEMA), as amended
    - In terms of the 2014 Environmental Impact Assessment Regulations pursuant to the NEMA, certain activities that may have a detrimental impact on the environment (termed Listed Activities) require an Environmental Authorisation (EA) from the DEA. The implementation of interventions will trigger NEMA Listing Notices 1 and 3 (G.N. R983 and G.N R985 as amended by R327 and R324 respectively). In order to meet the requirements of these Regulations, it is necessary to undertake a Basic Assessment (BA) Process and apply for an EA. This was previously undertaken on an annual basis per Province for each individual wetland unit. However as of 2014, applications were submitted (per Province) for wetland systems, allowing WfWetlands to undertake planning in subsequent years within these wetlands without having to undertake a BA process. The rehabilitation plans still however require approval from the competent authority (i.e. DEA).
    - **Basic Assessment Reports** (BARs) will be prepared for each Province where work is proposed by the WfWetlands Programme. These BARs will present all Wetland Projects that are proposed in a particular province, together with information regarding the quaternary catchments and the wetlands that have been prioritised for the next few planning cycles (anywhere from one to three planning cycles depending

on the information gained through the Catchment Prioritisation Process). The EA's will be inclusive of all Listed Activities that may be triggered and will essentially authorise any typical wetland rehabilitation activities required during the WfWetlands Programme implementation phase. Note that certain Listed Activities have been excluded from the Basic Assessment as they fall under the ambit of a 'maintenance management plan' in the form of the Rehabilitation Plan for each project and are therefore subject to exclusion. The impacts thereof have however been considered within the respective Rehabilitation Plans.

- A condition of the EAs is that **Rehabilitation Plans** will be prepared every year after sufficient field work has been undertaken in the wetlands that have an EA. These Rehabilitation Plans will be made available to registered Interested and Affected Parties (I&APs) before being submitted to DEA for approval. The Rehabilitation Plans will describe the combination and number of interventions selected to meet the rehabilitation objectives for each Wetland Project, as well as an indication of the approximate location and approximate dimensions (including footprint) of each intervention.

- The National Water Act, No.36 of 1998 (NWA)
  - In terms of Section 39 of the NWA, a General authorisation[3] (GA) has been granted for certain activities that are listed under the NWA that usually require a Water Use License; as long as these activities are undertaken for wetland rehabilitation. These activities include '*impeding or diverting the flow of water in a watercourse*[4]' and '*altering the bed, banks, course or characteristics of a watercourse*[5]' where they are specifically undertaken for the purposes of rehabilitating[6] a wetland for conservation purposes. The WfWetlands Programme is required to register the 'water use' in terms of the GA.

- The National Heritage Resources Act, No. 25 of 1999 (NHRA)
  - In terms of Section 38 of the NHRA; any person who intends to undertake a development as categorised in the NHRA must at the very earliest stages of initiating the development notify the responsible heritage resources authority, namely the South African Heritage Resources Agency (SAHRA) or the relevant provincial heritage agency. These agencies would in turn indicate whether or not a full Heritage Impact Assessment (HIA) would need to be undertaken. Should a permit be required for the damaging or removal of specific heritage resources, a separate application will be submitted to SAHRA or the relevant provincial heritage agency for the approval of such an activity. WfWetlands has engaged with SAHRA regarding the wetland planning process and has committed to achieving full compliance with the heritage act over the next few years.

[3]Government Notice No. 1198, 18 December 2009
[4]Section 21(c) of the NWA, No. 36 of 1998
[5]Section 21(i) of the NWA, No. 36 of 1998
[6]Defined in the NWA as "*the process of reinstating natural ecological driving forces within part of the whole of a degraded watercourse to recover former or desired ecosystem structure, function, biotic composition and associated ecosystem services*".

Appendix B2

LANDOWNER AGREEMENTS

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Working for Wetlands

Working for Wetlands Programme

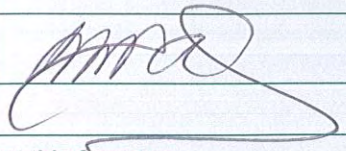
Wetlands Rehabilitation Activities Consent

Property Details	
Property Type:	Natural Heritage Site
Registration Division:	Registered with South African Heritage Site
Farm Number:	306
Portion Number:	306
Farm Name:	Soutini-Baleni
Surveyor-General Key:	N/A
Province:	Limpopo
Unique Wetland Number:	B81A

Owner Details							
Owner Name: (Full Names/Full Registered Name)	Mahumani Traditional Authority (His Majesty Hosi A K Mahumani)						
Person Type:		Company		Close corporation		Trust	Natural person
Registration/Identity Number:	5604115254082 Traditional Authority (Where applicable. For a trust, attach a copy of the latest letters of trusteeship issued by the Master of the High Court.)						
Owner's chosen address for delivery of notices and documents:	Postal Address: PO Box 2723 Giyani 0826		Physical Address: Nkomo 22B Village Giyani 0826				
	Telephone Number: 0797211313 0794963770		Email Address: amahumani@gmail.com				

Project Name:	Soutini Baleni

I/We hereby consent to the Working for Wetlands Programme and its appointed implementers undertaking the wetland rehabilitation activities listed in annexure "WFW 003A" attached hereto, for the project referred to above, subject to my/our approval of the relative Wetland Rehabilitation Plan, on the property described above of which I am the owner.

Name	Khavhareni Aarone Mahumani	**Position**	His Majesty Hosi
Signature		**Date**	08/09/2018

Please fax or post this form to:	**With a copy to:** The Planning, Monitoring and Evaluation Manager Working for Wetlands Programme, Private Bag X101, PRETORIA, 0001 Telefax (012) 8435165

Wetland rehabilitation activities to be carried out in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), as amended

[*Note: To be added to/amended as appropriate*]

Please note: The description of the project activities may not all occur, however they do provide some context for the possible interventions that may be implemented on your land.

Listed activity as described in GN 983, 984 & 985
***GN 983 (as amended): Activity 12**: the development of-* *i. dams or weirs, where the dam weir, including infrastructure and water surface area, exceeds 100 m²; or* *ii. infrastructure or structures with a physical footprint of 100 m² or more;* *where such developments occurs-* *(a) within a watercourse;* *(b) in front of development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;-* *excluding-* *(ee) where such development occurs within existing roads, road reserve or railway line reserves; or*
***GN R983 (as amended): Activity 19:** The infilling or depositing of material of more than 10 m³ into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 m³ from a watercourse;* *But excluding where such infilling, depositing, dredging, excavation, removal or moving-* *(a) will occur behind a development setback;* *(b) is for maintenances purposes undertaken in accordance with a maintenance management plan;*
***GN R983 (as amended): Activity 27:** The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for –* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.*
***GN 983 (as amended): Activity 48:** The expansion of-* *(i) infrastructure or structures where the physical footprint is expanded by 100 m² or more; or* *(ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 m² or more;* *where such expansion occurs-* *(a) within a watercourse;* *(b) in front of a development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;* *excluding-* *(ee) where such expansion occurs within existing roads, road reserves or railway line reserves.*
***GN R984 (as amended): Activity 15:** The clearance of an area of 20 hectares or more, except where such clearance of indigenous vegetation is required for –* *ii. maintenance purposes undertaken in accordance with a maintenance management plan.*

GN R984 (as amended): Activity 24: *The extraction or removal of peat or peat soils, including the disturbance of vegetation or soils in anticipation of the extraction or removal of peat or peat soils, but excluding where such extraction or removal is for the rehabilitation of wetlands in accordance with a maintenance management plan.*

GN R985 (as amended): Activity 12 (e): *The clearance of an area of 300 m² 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.*

e. Limpopo

i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;

ii. Within critical biodiversity areas identified in bioregional plans; or

iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.

GN 985 (as amended): Activity 14 (e): *The development of-*

(i) Dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 m²; or

(ii) Infrastructure or structures with a physical footprint of 10 m² or more;

Where such development occurs-

(a) Within a watercourse;

(b) In front of a development setback; or

(c) If no development setback has been adopted within 32 of a watercourse, measured from the edge of a watercourse;

excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.

e. Limpopo

i. Outside urban areas:

(aa) A protected area identified in terms of NEMPAA, excluding conservancies;

(bb) National Protected Area Expansion Strategy Focus areas;

(cc) World Heritage Sites;

(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;

(ee) Sites or areas identified in terms of an international convention;

(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;

(gg) Core areas in biosphere reserves; or

(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;

GN R985 (as amended): Activity 23 (e): *The expansion of-*

(i) dams or weirs where the dam or weir is expanded by 10 m² or more; or

(ii) infrastructure or structures where the physical footprint is expanded by 10 m² or more;

Alam

where such expansions occurs-

(a) within a watercourse;

(b) in front of a development setback adopted in the prescribed manner; or

(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;

excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.

e. *Limpopo*

i. Outside urban areas:

(aa) A protected area identified in terms of NEMPAA, excluding conservancies;

(bb) National Protected Area Expansion Strategy Focus areas;

(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;

(dd) Sites or areas identified in terms of an international convention;

(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;

(ff) Core areas in biosphere reserves; or

(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;

Appendix B3

WRITTEN NOTIFICATION

PO Box 494
Cape Town
8000
Email: Franci.Gresse@aurecongroup.com

14 October 2019

Dear Sir / Madam,

WORKING FOR WETLANDS REHABILITATION PROJECT
PUBLIC PARTICIPATION PROCESS:
AVAILABILITY OF BASIC ASSESSMENT REPORTS AND REHABILITATION PLANS FOR COMMENT

This letter is available in any of the official languages on written request.

Our previous communication of 06 June 2019 regarding the availability of the Draft Basic Assessment Reports (BARs) and Rehabilitation Plans for the above-mentioned project has reference.

Aurecon South Africa (Pty) Ltd is lodging new applications for Environmental Authorisation with the Department of Environmental Affairs (DEA) for the Eastern Cape, Gauteng, KwaZulu-Natal and Limpopo provinces. Due to an unforeseen delay during the submission of the finalised reports for these projects, the previous application lapsed, requiring new applications to be lodged with the Department. The June 2019 reports have subsequently been updated for the current 30-day public comment period required for the new application processes. All comments received during the previous application process are available in Appendix B of the Basic Assessment Reports.

1. BACKGROUND INFORMATION

WfWetlands is a government programme managed by the Natural Resource Management (NRM) directorate of the Department of Environmental Affairs (DEA), and is a joint initiative with the Department of Water and Sanitation (DWS) and the Department of Agriculture, Fisheries and Forestry (DAFF). The programme is mandated to rehabilitate damaged wetlands and to protect pristine wetlands throughout South Africa. Emphasis is placed on complying with the principles of the Expanded Public Works Programme (EPWP) which seeks to draw significant numbers of unemployed people into the productive sector of the economy, gaining skills while they work and increase their ability to earn an income.

The Aurecon team comprises Design Engineers and Environmental Assessment Practitioners (EAPs) who undertake the planning, design and authorisation components of the project. The Aurecon Team, in partnership with GroundTruth, is assisted by an external team of Wetland Specialists who provide scientific insight into the operation of wetlands and bring expert and often local knowledge of the wetlands. The project team is also complimented by the Assistant Director for Wetlands Programmes (ASDs) who are each responsible for provincial planning and implementation.

2. THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, NO. 107 OF 1998 (AS AMENDED) (NEMA)

2.1 Basic Assessment

In terms of the environmental management principles of NEMA certain activities that may have a detrimental impact on the environment (termed Listed Activities) require Environmental Authorisation (EA) from DEA. Many of the activities associated with the rehabilitation of the wetland are listed Activities in terms of Government Notice Regulation (GN R) 983 Listing Notice 1 and GN R985 Listing Notice 3 of NEMA (as amended):

- Listing Notice 1: Activities 12, 19, 27 and 48
- Listing Notice 3: Activities 12, 14 and 23

In terms of GN R982 (as amended), activities identified in Listing Notices 1 and 3 require a Basic Assessment (BA) process to be undertaken during which potential biophysical and socio-economic impacts are identified and assessed. Aurecon has undertaken this process on behalf of WfWetlands, and separate BA applications for each of the provinces listed in the table below, has been submitted to the DEA for consideration.

Province	Project	Nearest Town(s):
Eastern Cape	Amathole	Seymour
Gauteng	Gauteng North	Pretoria
KwaZulu-Natal	iSimangaliso	St Lucia
Limpopo	Soutini-Baleni	Giyani

The provincial level Basic Assessment Reports (BARs) provide the findings of the associated investigations and are available for public comment. The BARs describe the wetland systems that were identified as priorities for this planning cycle, together with the baseline information on the quaternary catchment.

2.2 Rehabilitation Plans

The project specific wetland rehabilitation plans include specialist reports prepared by the Wetland Specialist (which provide a site description, detailed baseline information, and the wetland context within the greater catchment). The rehabilitation plans also include the proposed interventions, objectives, their design details and specification, and proposed locations. Project specific rehabilitation plans were compiled for each project and describe the combination and number of interventions selected to meet the rehabilitation objectives for each Wetland Project, as well as an indication of the approximate location and approximate dimensions (including footprint) of each intervention.

3. THE NATIONAL WATER ACT, NO. 36 OF 1998 (NWA)

Activities associated with the rehabilitation of wetlands may constitute “water use” in terms of the NWA and may therefore require general authorisation or licenses from DWS. In general, a water use must be licensed unless:

a) It is listed in Schedule one (1) of the NWA,
b) It is existing lawful use,
c) It is permissible under a General Authorisation (GA), and
d) If a responsibility authority waives the need for a licence.

In terms of Section 39 of the NWA, a GA has been granted for certain activities that are listed and usually require a Water Use License. Such a GA (i.e. GN R1198 of 18 December 2009) exists for wetland rehabilitation as long as the activities are for conservation purposes.

4. OPPORTUNITY TO PARTICIPATE

Public Participation procedures are specified as a minimum requirement (Section 41 of GN R982) of the BA Process and must ensure that all Interested and Affected Parties (I&APs) (including State Departments) have an opportunity to participate. Accordingly, notice is hereby given of an additional 30-day public participation process (PPP) on the draft Basic Assessment Reports and Rehabilitation Plans. The BARs and Rehabilitation Plans will be made available for a 30-day comment period from 14 October 2019 until 12 November 2019.

The reports will be available from 14 October 2019 for download from the Aurecon Website: http://aurecongroup.com/en/public-participation.aspx. Please be aware that you will be required to register on the website and then again on the project to access the documents. Should you have any trouble accessing the documents,

please do not hesitate to contact Mr Simamkele Ntsengwane (details below).

I&APs have until 12 November 2019 to submit their comments on the BARs and rehabilitation plans to the EAPs below. I&APs should refer to the relevant province and specifically the wetland project (if applicable). Please include your name, contact details and an indication of any direct business, financial, personal or other interest that you may have in the applications in your submission.

Contact Person:	Mr Simamkele Ntsengwane	Miss Franci Gresse
Tel:	(021) 526 9560	(021) 526 6022
Email:	Simamkele.Ntsengwane@aurecongroup.com	Franci.Gresse@aurecongroup.com
Fax:	(021) 526 9500	
Mail:	PO Box 494, Cape Town, 8000	

5. WAY FORWARD

Following the 30-day public comment period, the BARs and rehabilitation plans will be updated by incorporating any I&AP comments received on the reports (where relevant), All comments received during the first application have been incorporated in the BARs and Public Participation Reports . All comments will be recorded and responded to in a Comments and Response Report which will be circulated to all who have provided comment. The updated BARs and/or rehabilitation plans will then be submitted to DEA for their decision. Once DEA has made their decision on the proposed projects, all registered I&APs will be notified of the outcome of the decision within fourteen (14) calendar days of the decision and the right to appeal.

Yours sincerely
AURECON

Franci Gresse
Senior Environmental Practitioner
Aurecon, Environment and Planning Services

APPENDIX B4

PROOF OF MAILING

Appendix B5

COMMENTS AND RESPONSES

Any comments received and responses sent during the 30-day public comment period will be included with the Final Basic Assessment Report submitted to the Department of Environmental Affairs.

Simamkele Ntsengwane

From: Simamkele Ntsengwane
Sent: Monday, February 4, 2019 10:37 AM
To: Thomas Tshenge Tshivhandekano
Cc: Franci Gresse
Subject: RE: Public Participartion-Working For Wetland Programme -Mutale(Thoyandou town)

Good day Thomas,

Thank you for your interest in the Working for Wetlands project.
This serves to confirm that you have been registered as an Interested and Affected Party (I&AP) for the abovementioned project and will be kept informed during the process. Notification will be sent to all registered I&APs prior to the start date of the Basic Assessment Report (BAR) and project specific rehabilitation plan commenting period.

Kind Regards
Simamkele Ntsengwane BSc (Hons) Env. Geography
Senior Consultant, Environment and Planning, Aurecon
T +27 21 526 9560 **M** +27 76 225 3548
www.linkedin.com/in/simamkele-ntsengwane-205689a3/
Simamkele.Ntsengwane@aurecongroup.com
Aurecon Centre, 1 Century City Drive, Waterford Precinct, Century City South Africa 7441
PO Box 494, Cape Town 8000 South Africa
aurecongroup.com

From: Thomas Tshenge Tshivhandekano <ttshenge@gmail.com>
Sent: Monday, February 4, 2019 9:42 AM
To: Simamkele Ntsengwane <Simamkele.Ntsengwane@aurecongroup.com>
Subject: Public Participartion-Working For Wetland Programme -Mutale(Thoyandou town)

Good day,

I will like to partake in the process for working for wetland programme basic assessment at Mutale under Thohoyandou town.

Kindly regards

Thomas Tshivhandekano

Simamkele Ntsengwane

From: Simamkele Ntsengwane
Sent: Wednesday, February 13, 2019 1:53 PM
To: 'Baloyi F K'
Cc: Franci Gresse
Subject: RE: Working for wetlands: public participation process

Good Day Mr Baloyi,

Thank you for your interest in the Working for Wetlands Project.

Following our telephonic conversation earlier, this is to confirm that Electronic copies (in a CD format) of the Basic Assessment Report have been sent to Mr Meshack Masindi and Mr Vincent Egan of the Limpopo Department of Economic Development, Environment and Tourism (LEDET).

Kind Regards

Simamkele Ntsengwane BSc (Hons) Env. Geography
Senior Consultant, Environment and Planning, Aurecon
T +27 21 526 9560 **M** +27 76 225 3548
www.linkedin.com/in/simamkele-ntsengwane-205689a3/
Simamkele.Ntsengwane@aurecongroup.com
Aurecon Centre, 1 Century City Drive, Waterford Precinct, Century City South Africa 7441
PO Box 494, Cape Town 8000 South Africa
aurecongroup.com

From: Baloyi F K <BaloyiFK@ledet.gov.za>
Sent: Tuesday, February 12, 2019 11:11 AM
To: Simamkele Ntsengwane <Simamkele.Ntsengwane@aurecongroup.com>
Cc: Mamabolo SM <MamaboloSM@ledet.gov.za>; Ngoasheng T R <NgoashengTR@ledet.gov.za>
Subject: Working for wetlands: public participation process

Good morning

The Department acknowledges receipt of your email received on 11.02.2019 and informs you that as the commenting authority for the proposed project, the Department will only provide comments upon receipt of the reports (hard copies).

Kind regards,

Foster Baloyi (Mr.)
Limpopo Department of Economic Development, Environment and Tourism
Environmental Impact Management (EIM)
Evridiki Towers, Office A3-30

20 Hans Van Rensburg Street
Polokwane
0699
Cell: +27 76 412 5788 (Ext 6026)
Tel: +27 15 293 8540

"No one is guaranteed tomorrow, so make today your best".

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Private Bag X 447· PRETORIA · 0001· Environment House · 473 Steve Biko Road, Arcadia,· PRETORIA
Tel (+ 27 12) 399 9372

Reference: South-Baleni B82G
Enquiries: Thobekile Zungu/Seoka Lekota
Telephone: 012-399 9477 **E-mail:** Slekota@environment.gov.za

Wynand Loftus
Aurecon South Africa (Pty) Ltd
PO Box 494
CAPE TOWN
8000

Telephone Number: +27 (21) 526 9400
Email Address: capetown@aurecongroup.com

PER E-MAIL

Dear Sir/Madam

COMMENTS ON THE DRAFT BASIC ASSESSMENT REPORT AND THE REHABILITATION PLAN FOR SOUTH-BALENI, LIMPOPO PROVINCE

The Directorate: Biodiversity Conservation received and evaluated the DBAR and the Rehabilitation plans for South-Baleni B82G wetland system. The following recommendations must be considered:

- Mitigation measure proposed in the rehabilitation plan must be implemented and adhered to;
- Rehabilitation work must be done during low rainfall seasons and soil compaction should be prevented as far as possible;
- Implement applicable weirs, infillings and berms to stop on-going erosion and drains within wetlands and encourage sediment trapping;
- A permit must be acquired to disturb or remove all the protected and listed plant species on site from relevant authorities;
- Alien invasive plant species in and around wetland areas must be removed in terms National Environmental Management: Biodiversity Act (NEM:BA) and Conservation of Agricultural Resources Act (CARA). Follow up-actions for at least five years need to take place and
- All re-vegetation must be done with local indigenous plant species as specified by the Provincial Co-ordinator and/or Wetland Ecologist.

The overall biodiversity objective is to minimise loss to biodiversity as possible. In order to achieve this objective the above mentioned recommendations must be adhered to.

Yours faithfully.

Mr Stanley Tshitwamulomoni
Acting Director: Biodiversity Conservation
Department of Environmental Affairs
Date:

Simamkele Ntsengwane

From: Franci Gresse
Sent: Wednesday, March 6, 2019 10:18 AM
To: IvanR
Cc: Simamkele Ntsengwane
Subject: RE: Working for Wetlands Rehabilitation Project

Dear Mr Riggs

You can also access the documents on Dropbox by following this link:
https://www.dropbox.com/sh/53v4o0lvhyvc5ao/AABMT0VY2JaSSOzRlk9JTBbKa?dl=0

Please note that we have also provided CDs to your following colleagues:

- Ms Mpume Ntlokwana
- Ms Serah Muobeleni

If you continue to have difficulty accessing the documents, please let us know for further assistance.

Kind regards
Franci

Franci Gresse
Senior Consultant, Environment and Planning, Aurecon
T +27 21 5266022 **F** +27 86 7231750
Franci.Gresse@aurecongroup.com

From: IvanR <IvanR@daff.gov.za>
Sent: Tuesday, March 5, 2019 10:00 AM
To: Franci Gresse <Franci.Gresse@aurecongroup.com>
Subject: Working for Wetlands Rehabilitation Project

Good day
I have registered on your website to view the documents online but cannot access them.
Can you kindly supply the project reference numbers for the those below.

Province	Project	Nearest Town(s):
Eastern Cape	Amathole, Kromme and Tsitsikamma	Seymour, Kareedouw
Free State	Maluti	Harrismith and Phutha
Gauteng	Gauteng North	Pretoria
KwaZulu-Natal	iSimangaliso	St Lucia
Limpopo	Soutini-Baleni	Giyani
North West	Madikwe National Park and Molopo	Zeerust and Mahikeng

Regards

Ivan Riggs
Regional Manager
Directorate Land Use and Soil Management
Department of Agriculture, Forestry and Fisheries

Tel: 012 319 7562
Cell: 082 574 7650
IvanR@daff.gov.za

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Private Bag X 447· PRETORIA · 0001· Environment House · 473 Steve Biko Road, Arcadia,· PRETORIA

DEA Reference: 14/12/16/3/3/1/1994
Enquiries: Ms Mmamohale Kabasa
Telephone: (012) 399 9420 **E-mail:** MKabasa@environment.gov.za

Ms F Gresse
Aurecon South Africa (Pty) Ltd
PO Box 494
CAPE TOWN
8000

Telephone Number: (021) 526 6022
Email Address: Franci.Gresse@aurecongroup.com

PER MAIL / E-MAIL

Dear Ms Gresse

COMMENTS ON THE DRAFT BASIC ASSESSMENT REPORT FOR THE WORKING FOR WETLANDS PROGRAMME IN THE SOUTINI-BALENI WETLANDS SOUTH WEST OF THE TOWN OF GIYANI WITHIN THE GREATER TZANEEN LOCAL MUNICIPALITY IN THE LIMPOPO PROVINCE

The application for Environmental Authorisation (EA) and draft Basic Assessment Report (BAR) dated February 2019 and received by the Department on 11 February 2019, refer.

This letter serves to inform you that the following information must be included to the final BAR:

(a) Listed Activities

(i) Please ensure that all relevant listed activities are applied for, are specific and that it can be linked to the development activity or infrastructure as described in the project description.
(ii) The wetland areas selected for rehabilitated appear to be located in inaccessible areas with no definite access roads. The applicant must determine whether part of the rehabilitation activities will require the construction of access roads and whether this will trigger the applicable listed activities.
(iii) If the activities applied for in the application form differ from those mentioned in the final BAR, an amended application form must be submitted. Please note that the Department's application form template has been amended and can be downloaded from the following link https://www.environment.gov.za/documents/forms.
(iv) Please note that Table 4 on pages 7-8 titled "*Listed activities triggered by the proposed Soutini-Baleni*" project includes Activity 24 of Listing Notice 2 (GN R984, as amended). This activity triggers a full coping and EIA process, and not a Basic Assessment process. The EAP is required to determine the applicability of the activity, and if such activity is triggered, a new application for Environmental Authorisation must be lodged and the scoping/EIA process be followed for the proposed Soutini-Baleni Wetland Rehabilitation project.

(b) Public participation

(i) Please ensure that comments from all relevant stakeholders are submitted to the Department with the final BAR. This includes but is not limited to the Limpopo Province Department of Economic Development, Environment and Tourism, the Department of Agriculture, Forestry and Fisheries (DAFF), the provincial Department of Agriculture, the Department of Transport, the Greater Giyani Local Municipality, the Mopani District Municipality, the Department of Water and Sanitation (DWS), the South African Heritage Resources Agency (SAHRA), the Endangered Wildlife Trust (EWT), BirdLife SA, the Department of Mineral Resources, the Department of Rural Development and Land Reform, and the Department of Environmental Affairs: Directorate Biodiversity and Conservation.

(ii) Please ensure that all issues raised and comments received during the circulation of the draft BAR from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity are adequately addressed in the final BAR. Proof of correspondence with the various stakeholders must be included in the final BAR. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments.

(iii) A Comments and Response trail report (C&R) must be submitted with the final BAR. The C&R report must incorporate all comments for this development. The C&R report must be a separate document from the main report and the format must be in the table format as indicated in Annexure 1 of this comments letter. Please refrain from summarising comments made by I&APs. All comments from I&APs must be copied verbatim and responded to clearly. Please note that a response such as "noted" is not regarded as an adequate response to I&AP's comments.

(iv) The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014 as amended.

(v) The final BAR must also indicate that this draft BAR has been subjected to a public participation process.

(vi) The final BAR must indicate clearly the name of the newspaper that the advertisement for the draft BAR has been advertised.

(c) Maps

(i) The BAR must provide a clear site layout map at an appropriate scale with an indication of all the envisioned areas along the wetland system that will be subject to rehabilitation. All available biodiversity information must be used in the finalisation of this map. Existing infrastructure must be used as far as possible e.g. roads. The map must indicate the following:

- All supporting onsite infrastructure such as laydown area, roads, guard house and buildings, including accommodation etc.
- The location of sensitive environmental features on site e.g. CBAs, heritage sites, wetlands, drainage lines etc. that will be affected;
- Buffer areas; and
- All "no-go" areas.

(ii) The palaeontological sensitivity map on page 28 (Figure 10) of the draft BAR is not clear. There is no colour distinction to indicate the different sensitivity layers. A revised map must be submitted with the final BAR. The map must show the location of the Soutini-Baleni Wetland System in relation to different sensitivity layers.

(d) Specialist assessments

(i) It is noted that the Soutini-Baleni Wetland System is a formally declared Natural Heritage Site. Page 10 of the draft BAR indicates that a Heritage Impact Assessment conducted by Mr. Stephen Gaigher has been submitted with the draft BAR as Appendix D. Please note that no such specialist report has been appended to the draft BAR received by the Department on 11 February 2019.

(ii) The Applicant must ensure that the Heritage Impact Assessment referred to under point (i) above; is made available to SAHRA for comment. Recommendations from SAHRA must form part of the EMPr and Rehabilitation Plan Documents.

(iii) The following Important Bird Areas (IBAs) are located within 30km radius of the Soutini-Baleni Wetland System: The Wolkberg Forest Belt (IBA SA005) and the Kruger National Park Border (IBA SA002) that is located approximately 15km from the wetland system. The final BAR must include an avifaunal impact statement from a qualified avifaunal specialist on the possible impacts to any important avifaunal species that may utilise the Soutini-Baleni Wetland System.

(iv) The Soutini-Baleni Wetland System is located within an important cultural tourism area. The social impact assessment must also include an assessment of potential impacts on tourism in the area. The report must also include a tourism impact statement.

(v) The following Activities applied for may trigger Section 19; S21 (c) and (i) of the National Water Act No. 36 of 1998: GN R. 983 Activities 12 (i)(ii)(a); 48 (i)(ii)(a); GN R 985 Activities 14 (i)(ii)(a)(c)(e)(i)(ff)(hh), 23(i)(ii)(a)(c)(e)(i)(ee)(gg). The BAR must include a freshwater specialist study with the following terms of reference:

- Desktop mapping of freshwater ecosystems within the Department of Water and Sanitation's (DWS) 500m Water Use Licence trigger area around the wetland system;
- Field-based assessments of the potentially impacted systems to determine likely impacts and risks that the proposed rehabilitation measures may have on the wetland system.
- Fish management method statement for any fish relocations if any.
- Identify and recommend measures for mitigating impacts on the receiving environment.

(vi) The EAP must ensure that the terms of reference (TOR) for all the identified specialist studies must include the following:

- A detailed description of the study's methodology; indication of the locations and descriptions of the development footprint, and all other associated infrastructures that they have assessed and are recommending for authorisations.
- Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the right season and providing that as a limitation will not be allowed.
- Please note that the Department considers a 'no-go' area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure including access roads is allowed in the 'no-go' areas.
- Should the specialist definition of 'no-go' area differ from the Departments definition; this must be clearly indicated. The specialist must also indicate the 'no-go' area's buffer if applicable.
- All specialist studies must be final, and provide detailed/practical mitigation measures and recommendations, and must not recommend further studies to be completed post EA.
- Should specialists recommend specific mitigation measures, these must be clearly indicated.

(e) General

(i) The EAP must indicate based on the assessment, the specialist assessment conducted and the various engineering methods, which interventions at which locations will be most suited and should be authorised for this project. The mitigation measures and recommendations to be included in EMPr should also be provided by the EAP.

(ii) The BAR, specialist studies and EMPr must ensure compliance to the relevant appendices as outlined in the EIA Regulations, 2014 as amended.

(iii) The final BAR must include a copy of the Memorandum of Understanding for Working for Wetlands Programme referred to on page 4 of the draft BAR received on 11 February 2019.

(iv) The EAP is requested to contact the Department to make the necessary arrangements to conduct a site inspection prior to the submission of the final BAR.

(v) Please also ensure that the final BAR includes the period for which the Environmental Authorisation is required and the date on which the activity will be concluded as per Appendix 1 (3)(1)(q) of the NEMA EIA Regulations, 2014, as amended.

(vi) You are further reminded to comply with Regulation 19(1)(a) of the NEMA EIA Regulations, 2014, as amended, which states that:
"Where basic assessment must be applied to an application, the applicant must, within 90 days of receipt of the application by the competent authority, submit to the competent authority -
(a) a basic assessment report, inclusive of specialist reports, an EMPr, and where applicable a closure plan, which have been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority."

(vii) Should there be significant changes or new information that has been added to the BAR or EMPr which changes or information was not contained in the reports or plans consulted on during the initial public participation process, you are required to comply with Regulation 19(b) of the NEMA EIA Regulations, 2014, as amended, which states that:
"the applicant must, within 90 days of receipt of the application by the competent authority, submit to the competent authority – (b) a notification in writing that the basic assessment report, inclusive of specialist reports an EMPr, and where applicable, a closure plan, will be submitted within 140 days of receipt of the application by the competent authority, as significant changes have been made or significant new information has been added to the basic assessment report or EMPr or, where applicable, a closure plan, which changes or information was not contained in the reports or plans consulted on during the initial public participation process contemplated in subregulation (1)(a) and that the revised reports or, EMPr or, where applicable, a closure plan will be subjected to another public participation process of at least 30 days".

Should you fail to meet any of the timeframes stipulated in Regulation 19 of the NEMA EIA Regulations, 2014, as amended, your application will lapse.

You are hereby reminded of Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may commence prior to an Environmental Authorisation being granted by the Department.

Yours faithfully

Mr Sabelo Malaza
Chief Director: Integrated Environmental Authorisations
Department of Environmental Affairs
Signed by: Mr Coenrad Agenbach
Designation: Deputy Director: Strategic Infrastructure Developments
Date: 11/03/2019

cc:	Dr Farai Tererai	Working for Wetlands Programme	Email: Fterarai@environment.gov.za

Annexure 1

Format for Comments and Response Trail Report:

Date of comment, format of comment name of organisation/I&AP	**Comment**	**Response from EAP/Applicant/Specialist**
27/01/2016 Email Department of Environmental Affairs: Strategic Infrastructure Development (John Soap)	Please record C&R trail report in this format Please update the contact details of the provincial environmental authority	EAP: (~~Noted~~)The C&R trail report has been updated into the desired format, see Appendix K EAP: Details of provincial authority have been updated, see page 16 of the Application form

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Nokukhanya Khumalo
Tel: 021 462 4502
Email: nkhumalo@sahra.org.za
CaseID: 13451

Final Comment

In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999)

Attention: Dr Farai Tererai
Working for Wetlands Programme

Working for Wetlands (WfWetlands) is a government programme mandated to protect pristine wetlands, promote their wise-use and rehabilitate those that are damaged throughout South Africa, with an emphasis on complying with the principles of the Expanded Public Works Programme (EPWP) and using only local Small, Medium and Micro Enterprises (SMMEs).Due to the nature of the project, it is important to note that the very objectives of the WfWetlands Programme are to improve both environmental and social circumstances

Working for Wetlands is proposing to rehabilitate the wetland area within the Baleni nature reserve located in the Greater Giyane Local Municipality of the Limpopo Province. They plan on accomplishing this by constructing weirs/gabions that will create a barrier that will allow for sedimentation build-up to slow the water flow and re-wet the wetland area. There will be 28 intervention areas in the wetland including a 325m cattle fence.

Aurecon South Africa (Pty) Ltd is undertaking a Basic Assessment process on behalf of Working for Wetlands, in respect of listed activities in the Environmental Impact Assessment (EIA) Regulations 2014, as amended, that require an application for Environmental Authorisation, in terms of the National Environmental Management Act, 1998 (NEMA), as amended.

To meet the requirements of section 38(8) of the National Heritage Resources Act, no 25 of 1999, a Heritage Impact Assessment (HIA) Report by G&A Heritage Management Consultants (Pty) Ltd had been submitted to South African Heritage Resources Agency (SAHRA) for commenting on 11/02/2019. In an Interim Comment issued on 18/03/2019, SAHRA summarised the HIA report as follows:

Gaigher, S. December 2018. Phase 1 Heritage Impact Assessment Report for the Proposed Anti-Erosion Measures at the Baleni Salt Works Provincial Heritage Site, Limpopo Province.

The author undertook a field assessment of the proposed wetland area and identified two heritage sites that may be impacted by the proposed intervention areas. The first site, Site 1 in the HIA is the same site that was described in a Masters research paper as site BS04; it consists of hut floor remains, ash deposits, and

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

potsherds of which some are diagnostic. This site will be partially impacted by trenching to install intervention measures to curb continued erosion. The author assessed the disturbance as beneficial to the long conservation of other archaeological sites downstream.

The second site, Site 2 is a single grave site located outside the proposed rehabilitation intervention areas. Both sites are of high heritage significance. As well as all other sites located within the entire wetland area is the Baleni Salt-works as it is a Provincial Heritage Site (PHS).

The author recommends:

No assessment of impacts on palaeontological resources because the study area is located in the grey zone in the SAHRA palaeo-map.

Site 1 must be mitigated by a qualified archaeologist in the area that will be disturbed by the installation of a gabions at Intervention B82G-01-213-00. In order to carry out the mitigations, a section 35 of the NHRA permit application must be applied for to SAHRA.

The cemetery must be protected by a 25 m buffer zone during construction.

The Chance Finds procedures provided in the report must be included in the EMPr for all intervention measures as well as the cattle fence construction.

SAHRA could not process the case to its conclusion until the accompanying environmental documents (BAR and appendices) were submitted to the case. The BAR has since been submitted and within section 7.1.4, it states that an archaeological excavation must be undertaken for site at 23°25'13" S 30°54'52" E (under a permit issued by SAHRA). The grave site at 23°25'13" S30°54'52" E will not be directly impacted but it may be impacted indirectly by construction activities. A buffer of 25 m radius must be applied to the grave site as a no-go area.

Final Comment

The South African Heritage Resources Agency (SAHRA) Archaeology, Palaeontology and Meteorites (APM) Unit accepts the recommendations provided in the HIA report however, the buffer zone around the grave must be increased to 30m.

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Nokukhanya Khumalo
Tel: 021 462 4502
Email: nkhumalo@sahra.org.za
CaseID: 13451

The following additional recommendations must also be included as part of the EMPr for implementation during construction:

- An archaeologist must be appointed to undertake a weekly monitoring programme of all construction activities and develop a heritage training manual for the induction of the construction crew and ECO.
- All access points to the construction site, construction camps, laydown areas and stockpile areas must be assessed by an archaeologist prior to the construction phase. A report of the walk down assessment must be submitted to SAHRA.
- Once the design of the weir is finalised the potential extent of flooding must be determined and the potential impacts to the surrounding heritage sites must be assessed. This assessment must be included in the walk-down report.
- A CMP must be developed from the findings of this assessment, the CMP must also address any monitoring measures required for the long-term maintenance of the weirs.
- In the unlikely event that fossils are uncovered during construction then construction must cease within the immediate vicinity, a buffer of 30 m must be established, and a palaeontologist called in to inspect the finds. The palaeontologist must obtain a section 35(4) permit in terms of NHRA and Chapter IV NHRA Regulations, before any fossils are collected.
- If there are any new heritages resources are discovered during construction and operation phases of the proposed development, then a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings at the expense of the developer.
- If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required at the expense of the developer. Mitigation will only be carried out after the archaeologist or palaeontologist obtains a permit in terms of section 35 of the NHRA (Act 25 of 1999). You may contact SAHRA APM Unit for further details: (Nokukhanya Khumalo/Phillip Hine 021 202 8654).
- If any unmarked human burials are uncovered and the archaeologist called in to inspect the finds and/or the police find them to be heritage graves, then mitigation may be necessary and the SAHRA Burial Grounds and Graves (BGG) Unit must be contacted for processes to follow (Thingahangwi Tshivase/Mimi Seetelo 072 802 1251).
- The Final BAR and its appendices must be uploaded to the case on SAHRIS.
- Once a decision on the EA application is reached, the record of decision must be uploaded to the case on SAHRIS.

Should you have any further queries, please contact the designated official using the case number quoted

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

above in the case header.

Yours faithfully

Nokukhanya Khumalo
Heritage Officer
South African Heritage Resources Agency

Phillip Hine
Acting Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

ADMIN:
Direct URL to case: http://www.sahra.org.za/node/520847

Terms & Conditions:

1. This approval does not exonerate the applicant from obtaining local authority approval or any other necessary approval for proposed work.
2. If any heritage resources, including graves or human remains, are encountered they must be reported to SAHRA immediately.
3. SAHRA reserves the right to request additional information as required.

Working for Wetlands- Limpopo 2019

Our Ref: 13451

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Nokukhanya Khumalo
Tel: 021 462 4502
Email: nkhumalo@sahra.org.za
CaseID: 13451

Date: Monday March 18, 2019

Interim Comment

In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999)

Attention: Dr Farai Tererai
Working for Wetlands Programme

Working for Wetlands (WfWetlands) is a government programme mandated to protect pristine wetlands, promote their wise-use and rehabilitate those that are damaged throughout South Africa, with an emphasis on complying with the principles of the Expanded Public Works Programme (EPWP) and using only local Small, Medium and Micro Enterprises (SMMEs).Due to the nature of the project, it is important to note that the very objectives of the WfWetlands Programme are to improve both environmental and social circumstances

Working for Wetlands is proposing to rehabilitate the wetland area within the Baleni nature reserve located in the Greater Giyane Local Municipality of the Limpopo Province. They plan on accomplishing this by constructing weirs/gabions that will create a barrier that will allow for sedimentation build-up to slow the water flow and re-wet the wetland area. There will be 28 intervention areas in the wetland including a 325m cattle fence.

Aurecon South Africa (Pty) Ltd is undertaking a Basic Assessment process on behalf of Working for Wetlands, in respect of listed activities in the Environmental Impact Assessment (EIA) Regulations 2014, as amended, that require an application for Environmental Authorisation, in terms of the National Environmental Management Act, 1998 (NEMA), as amended.

To meet the requirements of section 38(8) of the National Heritage Resources Act, no 25 of 1999, a Heritage Impact Assessment (HIA) Report by G&A Heritage Management Consultants (Pty) Ltd had been submitted to South African Heritage Resources Agency (SAHRA) for commenting.

Gaigher, S. December 2018. Phase 1 Heritage Impact Assessment Report for the Proposed Anti-Erosion Measures at the Baleni Salt Works Provincial Heritage Site, Limpopo Province.

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

The author undertook a field assessment of the proposed wetland area and identified two heritage sites that may be impacted by the proposed intervention areas. The first site, Site 1 in the HIA is the same site that was described in a masters research paper as site BS04; it consists of hut floor remains, ash deposits, and potsherds of which some are diagnostic. This site will be partially impacted by trenching to install intervention measures to curb continued erosion. The author assessed the disturbance as beneficial to the long conservation of other archaeological sites downstream.
The second site, Site 2 is a single grave site located outside the proposed rehabilitation intervention areas. Both sites are of high heritage significance. As well as all other sites located within the entire wetland area is the Baleni Salt-works as it is a Provincial Heritage Site (PHS).

The author recommends:

No assessment of impacts on palaeontological resources because the study area is located in the grey zone in the SAHRA palaeo-map.
Site 1 must be mitigated by a qualified archaeologist in the area that will be disturbed by the installation of a gabions at Intervention B82G-01-213-00. In order to carry out the mitigations, a section 35 of the NHRA permit application must be applied for to SAHRA.
The cemetery must be protected by a 25 m buffer zone during construction.
The Chance Finds procedures provided in the report must be included in the EMPr for all intervention measures as well as the cattle fence construction.

Interim Comment

SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit cannot comment on the HIA report until the BAR report is submitted to the case for review.

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

SAHRA will comment further once the BAR and its appendices are submitted to the case for review.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Nokukhanya Khumalo
Heritage Officer
South African Heritage Resources Agency

Phillip Hine
Acting Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

ADMIN:
Direct URL to case: http://www.sahra.org.za/node/520847

.

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Nokukhanya Khumalo
Tel: 021 462 4502
Email: nkhumalo@sahra.org.za
CaseID: 13451

Final Comment

In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999)

Attention: Dr Farai Tererai
Working for Wetlands Programme

Working for Wetlands (WfWetlands) is a government programme mandated to protect pristine wetlands, promote their wise-use and rehabilitate those that are damaged throughout South Africa, with an emphasis on complying with the principles of the Expanded Public Works Programme (EPWP) and using only local Small, Medium and Micro Enterprises (SMMEs).Due to the nature of the project, it is important to note that the very objectives of the WfWetlands Programme are to improve both environmental and social circumstances

Working for Wetlands is proposing to rehabilitate the wetland area within the Baleni nature reserve located in the Greater Giyane Local Municipality of the Limpopo Province. They plan on accomplishing this by constructing weirs/gabions that will create a barrier that will allow for sedimentation build-up to slow the water flow and re-wet the wetland area. There will be 28 intervention areas in the wetland including a 325m cattle fence.

Aurecon South Africa (Pty) Ltd is undertaking a Basic Assessment process on behalf of Working for Wetlands, in respect of listed activities in the Environmental Impact Assessment (EIA) Regulations 2014, as amended, that require an application for Environmental Authorisation, in terms of the National Environmental Management Act, 1998 (NEMA), as amended.

To meet the requirements of section 38(8) of the National Heritage Resources Act, no 25 of 1999, a Heritage Impact Assessment (HIA) Report by G&A Heritage Management Consultants (Pty) Ltd had been submitted to South African Heritage Resources Agency (SAHRA) for commenting on 11/02/2019. In an Interim Comment issued on 18/03/2019, SAHRA summarised the HIA report as follows:

Gaigher, S. December 2018. Phase 1 Heritage Impact Assessment Report for the Proposed Anti-Erosion Measures at the Baleni Salt Works Provincial Heritage Site, Limpopo Province.

The author undertook a field assessment of the proposed wetland area and identified two heritage sites that may be impacted by the proposed intervention areas. The first site, Site 1 in the HIA is the same site that was described in a Masters research paper as site BS04; it consists of hut floor remains, ash deposits, and

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

potsherds of which some are diagnostic. This site will be partially impacted by trenching to install intervention measures to curb continued erosion. The author assessed the disturbance as beneficial to the long conservation of other archaeological sites downstream.

The second site, Site 2 is a single grave site located outside the proposed rehabilitation intervention areas. Both sites are of high heritage significance. As well as all other sites located within the entire wetland area is the Baleni Salt-works as it is a Provincial Heritage Site (PHS).

The author recommends:

No assessment of impacts on palaeontological resources because the study area is located in the grey zone in the SAHRA palaeo-map.

Site 1 must be mitigated by a qualified archaeologist in the area that will be disturbed by the installation of a gabions at Intervention B82G-01-213-00. In order to carry out the mitigations, a section 35 of the NHRA permit application must be applied for to SAHRA.

The cemetery must be protected by a 25 m buffer zone during construction.

The Chance Finds procedures provided in the report must be included in the EMPr for all intervention measures as well as the cattle fence construction.

SAHRA could not process the case to its conclusion until the accompanying environmental documents (BAR and appendices) were submitted to the case. The BAR has since been submitted and within section 7.1.4, it states that an archaeological excavation must be undertaken for site at 23°25'13" S 30°54'52" E (under a permit issued by SAHRA). The grave site at 23°25'13" S30°54'52" E will not be directly impacted but it may be impacted indirectly by construction activities. A buffer of 25 m radius must be applied to the grave site as a no-go area.

Final Comment

The South African Heritage Resources Agency (SAHRA) Archaeology, Palaeontology and Meteorites (APM) Unit accepts the recommendations provided in the HIA report however, the buffer zone around the grave must be increased to 30m.

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Nokukhanya Khumalo
Tel: 021 462 4502
Email: nkhumalo@sahra.org.za
CaseID: 13451

The following additional recommendations must also be included as part of the EMPr for implementation during construction:

- An archaeologist must be appointed to undertake a weekly monitoring programme of all construction activities and develop a heritage training manual for the induction of the construction crew and ECO.
- All access points to the construction site, construction camps, laydown areas and stockpile areas must be assessed by an archaeologist prior to the construction phase. A report of the walk down assessment must be submitted to SAHRA.
- Once the design of the weir is finalised the potential extent of flooding must be determined and the potential impacts to the surrounding heritage sites must be assessed. This assessment must be included in the walk-down report.
- A CMP must be developed from the findings of this assessment, the CMP must also address any monitoring measures required for the long-term maintenance of the weirs.
- In the unlikely event that fossils are uncovered during construction then construction must cease within the immediate vicinity, a buffer of 30 m must be established, and a palaeontologist called in to inspect the finds. The palaeontologist must obtain a section 35(4) permit in terms of NHRA and Chapter IV NHRA Regulations, before any fossils are collected.
- If there are any new heritages resources are discovered during construction and operation phases of the proposed development, then a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings at the expense of the developer.
- If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required at the expense of the developer. Mitigation will only be carried out after the archaeologist or palaeontologist obtains a permit in terms of section 35 of the NHRA (Act 25 of 1999). You may contact SAHRA APM Unit for further details: (Nokukhanya Khumalo/Phillip Hine 021 202 8654).
- If any unmarked human burials are uncovered and the archaeologist called in to inspect the finds and/or the police find them to be heritage graves, then mitigation may be necessary and the SAHRA Burial Grounds and Graves (BGG) Unit must be contacted for processes to follow (Thingahangwi Tshivase/Mimi Seetelo 072 802 1251).
- The Final BAR and its appendices must be uploaded to the case on SAHRIS.
- Once a decision on the EA application is reached, the record of decision must be uploaded to the case on SAHRIS.

Should you have any further queries, please contact the designated official using the case number quoted

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

above in the case header.

Yours faithfully

Nokukhanya Khumalo
Heritage Officer
South African Heritage Resources Agency

Phillip Hine
Acting Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

ADMIN:
Direct URL to case: http://www.sahra.org.za/node/520847

Terms & Conditions:

1. This approval does not exonerate the applicant from obtaining local authority approval or any other necessary approval for proposed work.
2. If any heritage resources, including graves or human remains, are encountered they must be reported to SAHRA immediately.
3. SAHRA reserves the right to request additional information as required.

Franci Gresse

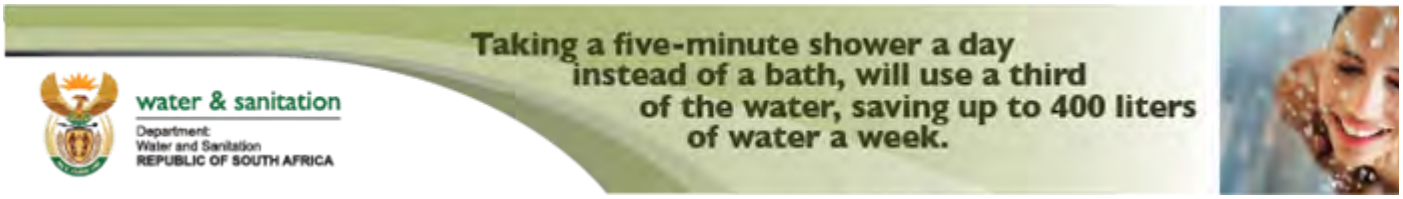
From: Ackerman Pieter <AckermanP@dws.gov.za>
Sent: Friday, June 7, 2019 8:49 AM
To: Simamkele Ntsengwane; Franci Gresse
Cc: Mulaudzi Nkhumbudzeni; Kuse Lumka; Roets Wietsche; Meulenbeld Paul; Khosa Tsunduka; Tonjeni Mzuvukile; Naidoo Bronwyn Roxanne
Subject: Working for Wetlands rehabilitation projects in all provinces: Comments to Aurecon

Hi Simamkele and Franci
My comments include:

1. Hydrological and ecological connectivity must be catered for in the designs.
2. It must be monitored if and how the ecological category changed after rehabilitation. PES oF category D to PES of B.
3. Scientific buffers must be included taking into account hydropedological flow drivers in the landscape
4. A guideline with concept designs must be compiled on how wetlands and pans can be re- created taking into account destruction of pans by mines.....OR a clear statement that the recreation is not possible in most cases.....In which casees can it work
5. A guideline with concept designs for constructed wetlands.
6. Lessons learned
7. Re introduction of plants and animals must be taken into account
8. Environmental awareness training for protection of the system in future.
9. Follow ups

Regards

Pieter Ackerman (PrLArch)
Chief Landscape Architect
Department of Water and Sanitation (DWS), South Africa
Sub Directorate Instream Water Use
Tel: 012 336 8217
Cell: 082 807 3512
Fax: 012 336 6608



Franci Gresse

From: Roets Wietsche <RoetsW@dws.gov.za>
Sent: Friday, June 7, 2019 8:44 AM
To: Simamkele Ntsengwane; Franci Gresse; Claire Blanché
Subject: RE: WORKING FOR WETLANDS REHABILITATION PROJECT: PUBLIC PARTICIPATION PROCESS: EXTENSION OF TIMEFRAMES AND AVAILABILITY OF BASIC ASSESSMENT REPORTS AND REHABILITATION PLANS FOR COMMENT

Dear Simamkele

You are mentioning the GA1198 in your document, please ensure that you comply to the requirements set out in GA1198 and submit relevant registration documents to the relevant regional operations of DWS.

Kind regards

Wietsche Roets (PhD) Pr.Sci.Nat.
Specialist Scientist
Sub-Directorate: In-stream Water Use

185 Francis Baard Street, Sedibeng Bldg, Room 437A
P/Bag X313, PRETORIA, 0001
Tel +27(0)12 336 6510
Cell +27(0)82 604 7730
Email: RoetsW@dws.gov.za

From: Simamkele Ntsengwane [mailto:Simamkele.Ntsengwane@aurecongroup.com]
Sent: 06 June 2019 04:48 PM
To: Franci Gresse; Claire Blanché
Subject: WORKING FOR WETLANDS REHABILITATION PROJECT: PUBLIC PARTICIPATION PROCESS: EXTENSION OF TIMEFRAMES AND AVAILABILITY OF BASIC ASSESSMENT REPORTS AND REHABILITATION PLANS FOR COMMENT
Importance: High

Dear Interested and Affected Party,

WORKING FOR WETLANDS REHABILITATION PROJECT: PUBLIC PARTICIPATION PROCESS: EXTENSION OF TIMEFRAMES AND AVAILABILITY OF BASIC ASSESSMENT REPORTS AND REHABILITATION PLANS FOR COMMENT

Our previous communication of 11 February 2019 regarding the availability of the Draft Basic Assessment Report (BAR) for the above-mentioned project has reference.

We Wish to inform you that The Department of Environmental Affairs (DEA) has granted an extension of timeframes in accordance with Regulation 19(1) (b) of GN R 982 of December 2014, as amended. This provision allows for the competent authority to extend the relevant prescribed timeframes and agree with the applicant on the length of such extension.

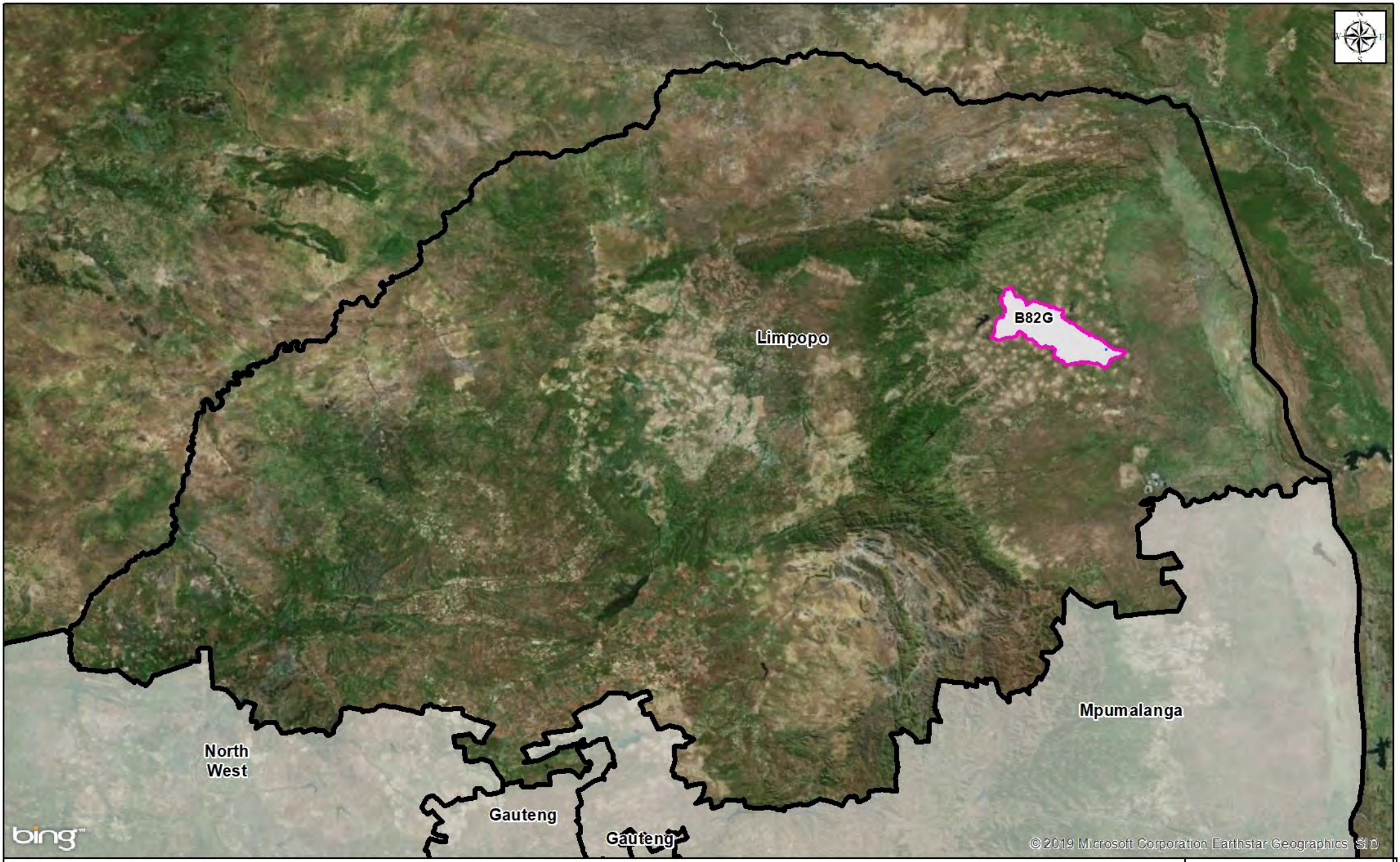
You are thereby invited to submit comments on the Revised Draft Basic Assessment Report (BAR) and Draft Rehabilitation Plan which is subject to a further 30-day Public Participation Process from **07 June 2019** up until **08 July 2019**.

Please find attached a cover letter with more details, the letter includes information on a brief background to the proposed project, information on the environmental process, where to access the documents in full and opportunities to participate.

The Basic Assessment Reports and Rehabilitation Plans for the projects listed in the table below are now available for a 30-day comment period. Electronic copies of these reports are available on Dropbox: **https://www.dropbox.com/sh/5hjupbn99xjul93/AAACkvlondnqa48pGraop1YQa?dl=0** and Aurecon's website (**http://www.aurecongroup.com/en/public-participation.aspx**).

Appendix C

MAPS



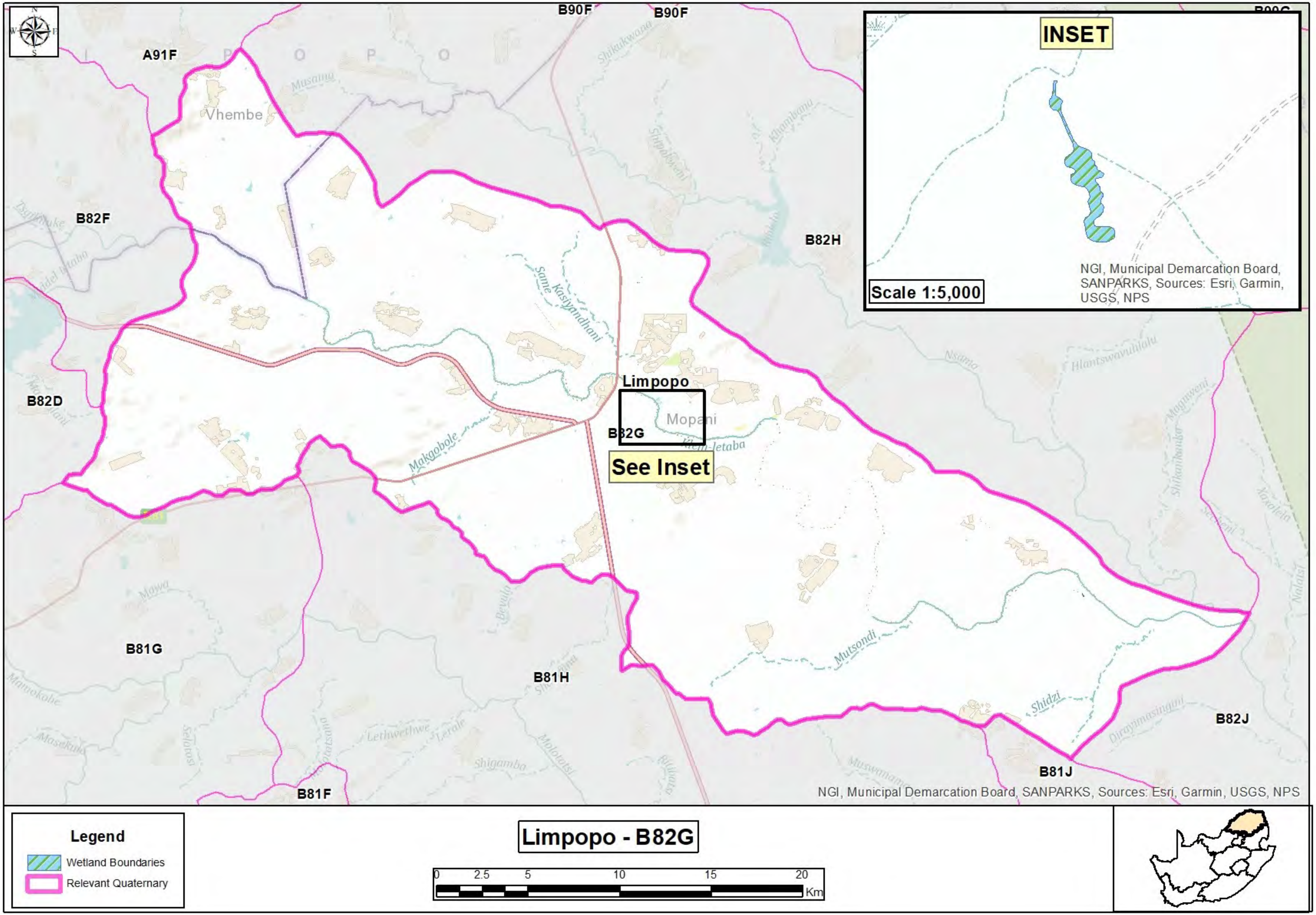
Legend

Provincial Boundaries

Quaternary Boundaries

Limpopo Province

0 25 50 100 150 200 Km



A91F
B90F
B90F
Vhembe
B82F
B82H
B82D
Limpopo
Mopani
B82G
See Inset
Makgobole
Klein-letaba
Mutsondi
Shidzi
B81G
B81H
B82J
B81J
B81F
INSET
Scale 1:5,000
NGI, Municipal Demarcation Board, SANPARKS, Sources: Esri, Garmin, USGS, NPS
NGI, Municipal Demarcation Board, SANPARKS, Sources: Esri, Garmin, USGS, NPS
Legend
Wetland Boundaries
Relevant Quaternary
Limpopo - B82G
0 2.5 5 10 15 20 Km

Critical Biodiversity Areas

CBA1	ESA1	NNR
CBA2	ESA2	ONA
Degraded	Protected	PA
		Other

Limpopo - Heritage Site Locations

0 0.0325 0.065 0.13 0.195 0.26 Km

Heritage Sites

- Soutini Baleni Heritage Sites
- Heritage Site 25m Buffer

Critical Biodiversity Areas

CBA1	ESA1	NNR
CBA2	ESA2	ONA
Degraded	Protected	PA
		Other

Limpopo B1 Valley Bottom

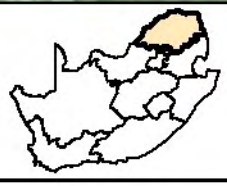
0 0.02 0.04 0.08 0.12 0.16 Km

Critical Biodiversity Areas

CBA1	ESA1	NNR
CBA2	ESA2	ONA
Degraded	Protected	PA
		Other

Limpopo B2 Wet Seep

0 0.0275 0.055 0.11 0.165 0.22
Km



Critical Biodiversity Areas

CBA1	ESA1	NNR
CBA2	ESA2	ONA
Degraded	Protected	PA
		Other

Limpopo B3 Wet Seep

0 0.0125 0.025 0.05 0.075 0.1 Km

Legend

- Wetland Boundary
- Relevant Quaternary

Limpopo B3 Wet Seep

0 0.0125 0.025 0.05 0.075 0.1 Km

Appendix D

ENVIRONMENTAL MANAGEMENT PROGRAMME

WORKING FOR WETLANDS PROGRAMME

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME

Date: September 2017
Version: 5

Prepared by:
Aurecon South Africa (Pty) Ltd
PO Box 494
Cape Town
8000

Prepared for:
Working for Wetlands Programme
Department of Environmental Affairs:
Natural Resource Management
Private Bag X447
0001

REPORT CONTROL

Document control					
Report title	Working for Wetlands Programme: Construction Environmental Management Programme				
Prepared by	Aurecon South Africa (Pty) Ltd PO Box 494 Cape Town 8000				
On behalf of	Working for Wetlands Programme (WfWetlands) Department of Environmental Affairs: Natural Resource Management Private Bag X447 0001				
Client contact	Ms Franci Gresse Tel: 021 526 9400		**WfWetlands contact**	Dr Farai Tererai Tel: 012 399 8970	
Rev	**Date**	**Author**	**Reviewer**	**Verifier**	**Approver**
1	Sept. 2010	SANBI	N/A	N/A	SANBI
2	Oct. 2012	A. Beetge	A. Beetge	A. Beetge	U. Bahadur
3	July 2015	Z. Palmer	F. Gresse	A. Beetge	F. Tererai
4	Nov. 2015	Z. Palmer	F. Gresse	A. Beetge	F. Tererai
5	Sept. 2017	M. Lowies & F. Gresse	F. Gresse	A. Beetge	F. Tererai
Approval					
Author signature			**Approver signature**		
Name			**Name**		
Title			**Title**		
Date			**Date**		

TABLE OF CONTENTS

List of Annexures

Annexure A: Basic Code of Conduct / Implementation

Annexure B: Site Environmental File & Templates

Annexure C: Sensitive Areas

Annexure D: Minimum Standards for Construction and Maintenance

Annexure E: Curriculum Vitae of EAP

List of Figures

List of Tables

ACRONYMS

BAR	Basic Assessment Report
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EMPr	Construction Environmental Management Programme
EPWP	Expanded Public Works Programme
GPS	Global Positioning System
IE	Implementing Entity
NEMA	National Environmental Management Act (Act 107 of 1998)
NRM	Natural Resource Management
PC	Provincial Coordinator[1]
PDP	Professional Driving Permit
PIP	Project Implementation Plan
PPE	Personal Protective Equipment
PPR	Project Progress Report
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resources Agency
SEP	Site Environmental File
SETA	Sector Education and Training Authority

[1] Also referred to as Assistant Director: Wetlands Programme.

DEFINITIONS

Alien species[2]:

(a) a species that is not an indigenous species; or

(b) an indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention.

Approved: Means approved in terms of the applicable legal requirements (e.g. NEMA approval/ Environmental Authorisation) and/or has been approved by the WfWetlands Programme's Deputy Director: Planning, Monitoring and Evaluation and/or an authorised representative of the WfWetlands Programme.

Archaeological[3]:

(a) material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;

(b) rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;

(c) wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which the South African Heritage Resource Agency (SAHRA) considers to be worthy of conservation; and

Auditing[4]: A systematic, documented, periodic and objective evaluation which provides verifiable findings, in a structured and systematic manner, on:

(a) the level of performance against and compliance of an organisation or project with the provisions of the requisite environmental authorisation or Environmental Management Programme (EMPr) and, where applicable, the closure plan; and

(b) the ability of the measures contained in the EMPr, and where applicable the closure plan, to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity.

Authority*:* National, regional or local authority, that has a decision-making role or interest in the project.

Basic Assessment Report (BAR): A report as described in Regulation 19 of GN R982 (2014, as amended) of the National Environmental Management Act (No. 107 of 1998, as amended) (NEMA).

Best Management Practice (BMP): Procedures and guidelines to ensure the effective and appropriate implementation of wetland rehabilitation by WfWetlands implementers.

[2] National Environmental Management: Biodiversity Act (No. 10 of 2004)
[3] National Heritage Resources Act (No. 25 of 1999)
[4] Regulation 34 of GN R982 (2014, as amended) of NEMA

Cement laden water: Means water (fresh or wash water) which has been in contact with partially cured concrete/mortar or raw cement product and which contains suspended and dissolved cement solids.

Commence: The start of any physical activity, including site preparation and any other activity on site furtherance of a listed activity or specified activity, but does not include any activity required for the purposes of an investigation or feasibility study as long as such investigation or feasibility study does not constitute a listed activity or specified activity.

Contaminated water: Means water contaminated by the Implementing Entity's activities such as with hazardous substances, hydrocarbons, paints, solvents and runoff from plant, workshop or personnel wash areas but excludes water containing cement/ concrete or silt.

Corrective (or remedial) action*:* Reactive response required to address an environmental problem that is in conflict with the requirements of the EMPr. The need for corrective action may be determined through monitoring, audits or management review.

Dam[5]: Any barrier dam and any other form of impoundment used for the storage of water, excluding reservoirs.

Dangerous goods: Goods containing any of the substances as contemplated in South African National Standard No. 10234, supplement 2008 1.00: designated "*List of classification and labelling of chemicals in accordance with the Globally Harmonized Systems (GHS)"* published by Standards South Africa, and where the presence of such goods, regardless of quantity, in a blend or mixture, causes such blend or mixture to have one or more of the characteristics listed in the Hazard Statements in section 4.2.3, namely physical hazards, health hazards or environmental hazards.

Decommissioning[6]: To take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned.

Dust[7]: Any material composed of particles small enough to pass through a 1 mm screen and large enough to settle by virtue of their weight into the sampling container from the ambient air.

Eco-log: A cylindrical sleeve made from, for example wire mesh, filled with organic material and/or soil used to prevent and/or repair minor erosion.

Ecosystem services or 'eco services': The services such as sediment trapping or water supply, supplied by an ecosystem (in this case a wetland ecosystem).

Endangered species: Means any indigenous species listed as an endangered species in terms of section 56 of the National Environmental Management Biodiversity Act ((No. 10 of 2004).

Endemic: An "endemic" is a species that grows in a particular area (i.e. it is endemic to that region) and has a restricted distribution. It is only found in a particular place. Whether something is endemic or not depends on the geographical boundaries of the area in question and the area can be defined at different scales.

[5] GN R983 (2014, as amended) of NEMA
[6] GN R983 (2014, as amended) of NEMA
[7] National Dust Regulations GN R827 (2013)

Environment[8]: Means the surroundings within which humans exist and that are made up of:

i. the land, water and atmosphere of the earth;

ii. micro-organisms, plant and animal life;

iii. any part or combination of i) and ii) and the interrelationships among and between them; and

iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Assessment Practitioner (EAP): The individual responsible for the planning, management and coordination of the environmental impact assessments, strategic environmental assessments, environmental management plans and/or other appropriate environmental instruments introduced through regulations of NEMA.

Environmental Impact Assessment (EIA): A study of the environmental consequences of a proposed course of action via the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

Environmental impact: An environmental change caused by some human act.

Environmental impact: Change in an environment resulting from the effect of an activity on the environment, whether positive or negative. Impacts may be the direct consequence of an individual's or organisation's activities or may be indirectly caused by them (DEAT, 1998).

Erosion: The loss of soil through the action of water, wind, ice or other agents, including the subsidence of soil.

Establishment of grass: Refers to all necessary procedures taken to produce an acceptable cover of specified live grass over an area.

Gabion: A structure made of wire mesh baskets filled with regularly sized stones, and used to prevent and/or repair erosion. They are flexible and permeable structures which allow water to filter through them. Vegetation and other biota can also establish in/around the habitat they create.

Hazard: Means a source of or exposure to danger.

Invasive alien species control:

(a) to combat or eradicate an alien or invasive species; or

(b) where such eradication is not possible, to prevent, as far as may be practicable, the recurrence, re-establishment, re-growth, multiplication, propagation, regeneration or spreading of an alien or invasive species.

Implementing Entity: The entity responsible for the construction of WfWetlands rehabilitation interventions by means of various contracted teams.

Indigenous vegetation[9]: Refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.

[8] NEMA
[9] GN R983 (2014, as amended) of NEMA

Interested and Affected Parties (I&APs)[10]:

(a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;

(b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; c) all organs of state which have jurisdiction in respect of the activity to which the application relates.

Intervention: An engineered structure such as a concrete or gabion weir, earthworks or revegetation that that achieves identified objectives within a wetland e.g. raising of the water table within a drainage canal.

Invasive species[11]: Means any species whose establishment and spread outside of its natural distribution range-

(a) threaten ecosystems, habitats or other species or have demonstrable potential to threaten ecosystems, habitats or other species; and

(b) may result in economic or environmental harm or harm to human health.

Listed invasive species: Any invasive species listed in terms of sections 66(1), 67(1), 70(1)(a), 71(3) and 71A of the National Environmental: Biodiversity Act (No. 10 of 2004).[12]

Maintenance period: The period after the Establishment Period (Practical Completion), up to and until the end of the Maintenance Period (i.e. a period of 12 months).

Maintenance[13]: Means actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint.

Mine:

(a) used as a noun-

any excavation in the earth, including any portion under the sea or under other water or in any residue deposit, as well as any borehole, whether being worked or not, made for the purpose of searching for or winning a mineral;

any other place where a mineral resource is being extracted, including the mining area and all buildings, structures, machinery, residue stockpiles, access roads or objects situated on such area and which are used or intended to be used in connection with such searching, winning or extraction or processing of such mineral resource; and

(b) used as a verb-

in the mining of any mineral, in or under the earth, water or any residue deposit, whether by underground or open working or otherwise and includes any operation or activity incidental thereto, in, on or under the relevant mining area.

Mitigation: Actions to reduce the impact of a particular activity.

[10] Regulation 42 GN R983 (2014, as amended) of NEMA
[11] National Environmental Management: Biodiversity Act (No. 10 of 2004)
[12] Also refer to GN 864 (2016): Alien and Invasive Species Lists
[13] GN R983 (2014, as amended) of NEMA

Mitigation[14]**:** Means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible;

Monitoring[15]**:** The repetitive and continued observation, measurement and evaluation of environmental criteria to follow changes over a period of time and to assess the efficiency of control measures.

Nursery conditions: This refers to the necessary conditions that must be in place for maintaining strong healthy growth in all container plant materials on site. This includes for the protection of all container plants against wind, frost, direct sunlight, pests, disease and drought. It also includes for the provision of adequate and suitable water supply, fertilisers and all other measures necessary to maintain strong and healthy plant growth.

Offensive odour: Any smell which is considered to be malodorous or a nuisance to a reasonable person.

Pollution[16]**:** Means any change in the environment caused by substances;

(ii) radioactive or other waves; or

(iii) noise, odours, dust or heat,

emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.

Post-construction: Refers to the period of 12 months after the completion of the construction works, the onset coinciding with the maintenance period.

Potentially hazardous substance: Any substance or mixture of substances, product or material declared to be a hazardous substance under section 2(1) of the Hazardous Substance Act (1973).

Pre-construction: Refers to the period leading up to the establishment on site by the Implementing Entity.

Project: A defined area for which an approved rehabilitation plan exists for the WfWetlands Programme.

Public Participation Process (PPP): A process of involving the public in order to identify issues and concerns, and obtain feedback on options and impacts associated with a proposed project, programme or development. Public Participation Process in terms of NEMA refers to a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to specific project matters.

Quaternary Catchment: A fourth order catchment in a hierarchal classification system in which a primary catchment is the major unit and that is also the "principal water management unit in South Africa"[17]

[14] GN R983 (2014, as amended) of NEMA
[15] DEAT, 1998
[16] National Environmental Management Act (No. 107 of 1998, as amended)
[17] DWS Groundwater Dictionary. Available online: http://www.dwaf.gov.za/Groundwater/Groundwater_Dictionary/index.html?introduction_quaternary_catchment.htm

Reasonable: Means, unless the context indicates otherwise, reasonable in the opinion of the relevant environmental authority.

Rehabilitation: Refers to re-instating the driving ecological forces (including hydrological, geomorphological and biological processes) that underlie a wetland, so as to improve the wetland's health and the ecological services that it delivers; and

Restoring processes and characteristics that are sympathetic to and not conflicting with the natural dynamic of an ecological or physical system[18].

Scarifying: Loosening the soil in areas which have become hard and compacted and which need to be loosened in order to facilitate revegetation.

Shaping: Finishing all slopes which do not form part of the permanent works so that they do not exceed the maximum gradient stipulated in the approved rehabilitation plan.

Significant impact: Means an impact that may have a notable effect on one or more aspects of the environment or may result in k with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence.

Silt laden water: Means water (mostly overland surface runoff) containing a substantial concentration of suspended solids with increased turbidity. Usually occurs as a result of exposed/cleared ground surfaces, concentration of runoff and/or erosion of excavated or imported materials.

Site: This is the area described in the approved/authorised rehabilitation plan for the implementation of the rehabilitation measures. Where the area is not demarcated, it will include all adjacent areas, which are reasonably required for the activities for the Implementing Entity, and approved for such use by the Environmental Control Officer (ECO).

Slope: The inclination of a surface expressed as 1 unit of rise or fall for so many horizontal units.

Subsoil: The soil horizons between the topsoil horizon and the underlying parent rock.

Topsoil: The upper soil profile irrespective of the fertility appearance, structure, agriculture potential, fertility and composition of the soil, usually containing organic material and which is colour specific. Also referred to as the "O" and "A" horizons.

Waste: Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 the National Environmental Management: Waste Act (No. 59 of 2008)[19]. Examples include construction debris, chemical waste, used oils and lubricants, batteries, metal and wood off-cuts, excess cement/ concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

Watercourse:

(a) a river or spring;

(b) a natural channel in which water flows regularly or intermitted;

(c) a wetland, pan, lake or dam into which, or from which, water flows

[18] Wetland Management Series: WET-Origins, WRC Report TT 334/08, March 2008
[19] National Environmental Management: Waste Act (No. 59 of 2008, as amended)

A reference to a watercourse includes, where relevant, its bed and banks

Weir: A dam-type structure placed across a watercourse to raise the water table of the surrounding ground and trap sediment on the upstream face without preventing water flow. Weirs are generally used to prevent erosion from progressing up exposed gullies.

Wetland: Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water and which in normal circumstances supports or would support vegetation typically adapted to life in saturated soils[20] and,

Land where an excess of water is the dominant factor determining the nature of the soil development and the types of plants living there[21].

[20] National Water Act (No. 36 of 1998, as amended)
[21] Wetland Management Series: WET-Origins, WRC Report TT 334/08, March 2008

This page was left blank intentionally

1 INTRODUCTION

1.1 Project Overview

Working for Wetlands is a government programme managed by the Natural Resource Management (NRM) Programme of the Department of Environmental Affairs (DEA), and is a joint initiative with the Departments of Water and Sanitation (DWS), and Agriculture and Forestry and Fisheries (DAFF). In this way the programme is an expression of the overlapping wetland-related mandates of the three parent departments, and besides giving effect to a range of policy objectives, it also honours South Africa's commitments under several international agreements, especially the Ramsar Convention on Wetlands.

The programme is mandated to protect pristine wetlands, promote their wise-use and rehabilitate those that are damaged throughout South Africa, with an emphasis on complying with the principles of the Expanded Public Works Programme (EPWP) and using only local Small, Medium and Micro Enterprises (SMMEs). The EPWP seeks to draw significant numbers of unemployed people into the productive sector of the economy, gaining skills while they work and increasing their capacity to earn an income.

1.2 Purpose of the EMPr

An Environmental Management Programme (EMPr) is compiled as part of the requisite submissions contained in a Basic Assessment Report (BAR) or Environmental Impact Report (EIR) in order to obtain an Environmental Authorisation (EA) to proceed with a listed activity(ies) as defined in GN R982 (2014, as amended) of the National Environmental Management Act (No. 107 of 1998), as amended. Upon approval of the BAR or EIR and resultant issuing of the EA, the EMPr becomes a legally binding document of which compliance has to audited by an independent and appropriately qualified auditor as per Regulation 34 of GN R982 (2014, as amended).

The EMPr's main purpose is to document general and specific avoidance, mitigation and termination actions in order to address general and project specific impacts as identified by means of the EIA and/or Phase 2 planning process. Implementation of the actions specified in the EMPr can be contractually delegated to various parties involved in the project execution. However, legal compliance with the EA and EMPr remains with the EA holder and cannot be delegated or transferred. It is therefore of utmost importance that WfWetlands ensures that all parties involved are familiar with the contents and requirements of the EMPr as non-conformances can ultimately have legal and financial consequences to primarily the EA holder but also subsequently all other parties involved.

1.3 Auditing of compliance with the EA and EMPr

Compliance auditing has been transformed from a vague requirement under the 2006 and 2010 EIA regulations to a very specific set of actions and outcomes which are to be achieved under the 2014 EIA regulations. An audit report is now also subject to a specified structure and with specific content requirements (Appendix 7 of GN R982), as amended. According to GN R982 Appendix 7 (Section 2) the objectives of an audit report include *inter alia* the following:

a) to report on—

   i. the level of compliance with the conditions of the environmental authorisation and the EMPr, and where applicable, the closure plan; and

   ii. the extent to which the avoidance, management and mitigation measures provided for in the EMPr, and where applicable, the closure plan achieve the objectives and outcomes of the EMPr, and closure plan;

b) identify and assess any new impacts and risks as a result of undertaking the activity;

c) evaluate the effectiveness of the EMPr, and where applicable, the closure plan;

d) identify shortcomings in the EMPr, and where applicable, the closure plan; and

e) identify the need for any changes to the avoidance, management and mitigation measures provided for in the EMPr, and where applicable, the closure plan.

As per Regulation 34, sub-regulation 4 of GN R982, where the findings of the environmental audit report contemplated in sub- regulation (1) of GN R982 indicate:

(a) insufficient mitigation of environmental impacts associated with the undertaking of the activity; or

(b) insufficient levels of compliance with the environmental authorisation or EMPr and, where applicable the closure plan;

the holder must, when submitting the environmental audit report to the competent authority in terms of sub-regulation (1), submit recommendations to amend the EMPr or closure plan in order to rectify the shortcomings identified in the environmental audit report.

When submitting recommendations in terms of sub-regulation (4), such recommendations must have been subjected to a public participation process, which process has been agreed to by the competent authority and was appropriate to bring the proposed amendment of the EMPr and, where applicable the closure plan, to the attention of potential and registered interested and affected parties, including organs of state which have jurisdiction in respect of any aspect of the relevant activity and the competent authority, for approval by the competent authority.

Given the strict and onerous above-mentioned requirements in terms of compliance with the EA and EMPr as well as auditing thereof, it is therefore of utmost importance that the EMPr specifies realistic and auditable avoidance, mitigation and cessation actions which can be applied across a wide range of project in various geographical settings. The approach to the structure and content of this EMPr is discussed in more detail under Section 1.7 below.

1.4 Frequency of compliance auditing

The ECO and Implementing Entity is responsible for ensuring compliance with the EMPr. The ECO shall inspect the site prior to commencement of any construction activity, at least once per month during construction and on completion of construction to establish the level of compliance with this CEMP. At sensitive sites, bi-weekly inspections shall take place as a minimum.

Monthly site audits shall be undertaken by the ECO and a bimonthly Project Inspection Report submitted to the Working for Wetlands Deputy Director: Planning, Monitoring and Evaluation for review prior to the annual Compliance Audit taking place.

The annual Compliance Audit Report shall be submitted to the DEA collating the year's completed checklists. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified to the DEA.

1.5 Content of an EMPr

Environmental management programmes are intended to be documents which indicate how the mitigation and management measures proposed for a project can be implemented in practice. As such they should be practical, reasonable and feasible. They must also meet the requirements of the legislation (Table 1), in particular regulation 19 (4) of the 2014 EIA regulations (GN R982).

Table 1: Requirements of an EMPr as per Appendix 4 of the 2014 EIA regulations, GN R982 (2014, as amended)

Section	Description	Heading/ section in this EMPr
(a)	details of- (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Report control sheet Annexure E
(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Sections 1.1, 1.2 and 1.7
(c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Chapter 6 Annexure C
(d)	a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including- (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities;	Chapters 3-5
(f)	a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, including actions to - (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Chapters 4-5
(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Chapters 4-5
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Chapters 4-5
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 2.1; Chapters 4-5
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 2.1

Section	Description	Heading/ section in this EMPr
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Chapters 4-5
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Sections 1.3 and 1.4
(m)	an environmental awareness plan describing the manner in which- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 3.3 and Chapter 6
(n)	any specific information that may be required by the competent authority.	NA

1.6 Relevant legislation, guidelines and other documents

This EMPr should be read in the context of the following documents:

- Constitution of the Republic of South Africa Act (No. 108 of 1996)
- National Environmental Management Act, (No. 107 of 1998, as amended)
- National Environmental Management: Waste Act (No. 59 of 2008)
- National Forest Act (No. 84 of 1998)
- National Water Act (No. 36 of 1998)
- National Heritage Resources Act (No. 25 of 1999)
- Municipal Systems Act (No. 32 of 2000)
- Occupational Health and Safety Act (No. 85 of 1993)

Note that the EMPr is not intended to replace any of the above, but rather augment them. Compliance with the EMPr does not exempt the EA holder, i.e. WfWetlands, from compliance with the legal or management requirements of any other licence or permit issued in terms of the project.

1.7 The EMPr in the context of the WfWetlands programme

As discussed under the previous sections, an EMPr and compliance with the EMPr (including compliance auditing) is specifically and strictly regulated under the 2014 EIA regulations, as amended. The implementation of a standard EMPr across a programme as diverse as WfWetlands does however pose various challenges as a result of the wide variety of interventions, site conditions, types of wetland systems, ecological integrity and complexity and so forth.

As a result the EMPr has been written with the abovementioned challenges in mind. It therefore focuses on the typical activities and impacts related to a WfWetlands project and generic avoidance, mitigation and termination actions. The EMPr is augmented by a site specific Rehabilitation Plan which includes more site specific mitigation measures and requirements where required. It is recommended that

compliance auditing takes into account the specific mitigation measures recommended in the accompanying Rehabilitation Plan for each individual project as well.

- Allowance will also be made throughout the document for minor deviations to allow for site specific scenarios but with the condition that each deviation be approved by the provincial Programme's Provincial Coordinator (PC) and in the case of major deviations by the DEA (also see Annexure B).

2 IMPLEMENTATION OF THE EMPr

The EMPr is ultimately intended to aid in the implementation of specific actions on site in order to ensure that the impacts of a project are avoided or mitigated during the various project implementation phases. A number of role-players are required to actively participate in the implementation of the EMPr with different roles and responsibilities typically assigned to each. The various roles and responsibilities are outlined below.

2.1 Role-players and their functions/responsibilities

2.1.1 DEA

Responsible Entity: DEA	
• DEA (specifically the Legal Authorisations and Compliance Inspectorate) holds the ultimate authority and mandate in terms of ensuring environmental legislation is adhered to.	
Responsibilities	**Duration**
• Investigate reported non-compliances with EAs and EMPrs either as a result of findings by an ECO/auditor, reporting by the EA holder or public complaints. • Enforce compliance and adherence to the EA, EMPr or any other environmental legislation through a number of administrative and legal procedures should it prove that a person or organisation is in contravention of an EA, EMPr or other environmental authorisation.	Project lifespan

2.1.2 The EA holder

Responsible Entity: WfWetlands		
• Holds sole legal liability in terms of ensuring compliance to the EA and EMPr. • Some responsibilities resulting from the EA or EMPr can be delegated or transferred contractually.		
Responsibilities		**Duration**
Contractual	• Ensure that the EA and EMPr is included in the contract documentation for a project in order to ensure that compliance with the EA and EMPr is contractually binding. • Ensure that current standards and specifications forming part of the standard contract documentation allow for or are aligned to the requirements of the EA and EMPr. • Ensure that all PCs and Implementing Entities are familiar with the requirements of the EA and EMPr.	Appointment; Project lifespan

Responsibilities		Duration
Approvals and licences	• Identify, obtain and comply with all other necessary approvals, permits, authorisations and requirements set by the relevant National and Provincial Departments and Local Authority for the construction of engineering interventions for the rehabilitation of wetlands before any site preparation activities are undertaken.	Pre-construction
Record keeping	• Ensure that a proper record keeping system is in place to keep track of proof that copies of the EA and EMPr were issued to the PCs and Implementing Entities.	Pre-construction; Project lifespan

2.1.3 The PC

Responsible Entity: PC		
• The PC shall be responsible for his/her specific province to ensure compliance with the EMPr.		
Responsibilities		**Duration**
Approvals and licences	• Be fully aware of and understand all the requirements of the EA(s) and EMPr(s) issued for projects in his/her province. • Ensure compliance with the EA and implementation of the EMPr. • Ensure that each Implementing Entity receives a copy of the EA and EMPr for distribution to each contractor, with proof of receipt (e.g. a transmittal note or similar). • Ensure that each Implementing Entity fully understands the contents and requirements of the EA and EMPr and the legal and financial consequences of non-compliance.	Pre-construction; Project lifespan
Communication	• Communicate environmental issues associated with the site to the Implementing Entity, including having adequate environmental knowledge in the field of wetland rehabilitation to understand the detailed environmental issues associated with the project.	Pre-construction; Project lifespan
Site management	• Assist with developing a site environmental file and ensuring all documentation is filed correctly. • Assist with site or project specific challenges or problems which might result in a non-conformance with the EA and EMPr. • Provide guidance to Implementing Entities on practical solutions in achieving the outcomes and requirements of the EA and EMPr.	Pre-construction; Project lifespan

Responsibilities		Duration
Environmental training	• Confirm that Environmental Awareness training has been undertaken on all sites prior to construction commencing.	Pre-construction

2.1.4 The ECO

Responsible Entity: ECO		
• The PC shall perform the duties of the ECO via monthly inspections in order to minimise adverse environmental impacts and effects. • Any changes to any environmental management documentation must be reviewed and understood by the ECO. • The ECO has access to the construction site at all times. • Remain appointed until the site has been rehabilitated as specified in the EMPr.		
Responsibilities		**Duration**
Approvals and licences	• Ensure compliance with the EA, EMPr, permits issued and all the environmental legislation. • Be fully knowledgeable with the contents and the conditions of the EA and all amendments. • Be fully knowledgeable with the contents of the latest revision of the EMPr. • Be fully knowledgeable with the contents of all relevant environmental legislation, and ensure compliance with them.	Pre-construction
Communication	• Ensure that the contents of the EMPr are communicated to the Implementing Entity. • Escalate serious or repeat non-conformances to the relevant competent authority (i.e. DEA, DWS, SAHRA, etc.).	Pre-construction; Project lifespan
Site management	• Approve the site layout plan (showing environmental sensitive/ no-go areas). • Ensure that all relevant activities being undertaken on site are within the scope of the EA and within the boundaries of the approved layout plan.	Project lifespan
Environmental training	• Confirm that Environmental Awareness training has been undertaken on all sites prior to construction commencing.	Pre-construction
Method statements	• Ensure that all method statements required are submitted and approved prior to site establishment.	Pre-construction

Responsibilities		Duration
Record keeping	• Keep and maintain a schedule of current site activities including the monitoring of such activities. • Keep copies of all reports submitted to DEA. • Obtain and keep record of all documentation including: environmental authorisation from DEA, EMPr, basic assessment, site layout plan, method statements, all communication detailing changes that may have environmental implications, site inspection checklist, Environmental awareness training attendance register, Environmental incident report, environmental performance certificates (once a project has been completed) photographic records (before, during and after development), records of non-compliance and corrective action taken to remediate, permits, licenses, and authorisations such as waste disposal certificates, hazardous waste landfill site licenses etc. which are required by this facility.	Project lifespan
Audits	• Compile an audit checklist which complies with the requirements of GN R982 Appendix 7 and is able to measure compliance against the EA, EMPr, other relevant permits and contract environmental specifications (where applicable). • Escalate serious or repeat non-conformances to the relevant competent authority (i.e. DEA, DWS, SAHRA, etc.). • Work with the Implementing Entity and relevant stakeholders to resolve any areas of non-compliance with appropriate corrective action. • Assist the Implementing Entity in finding environmentally responsible solutions to problems. • Giving a report back on the environmental issues at the monthly site meetings and other meetings that may be called regarding environmental matters. • Submit final audit report to DEA upon project closure in accordance with the requirements of the EA and EMPr.	Project lifespan; Project closure

2.1.5 The Implementing Entity

Responsible Entity: Implementing Entity
• The Implementing Entity will be acting as the Project Manager and is responsible for complying with the EMPr during the construction phase of the development on a day-to-day basis. • The Implementing Entity will be responsible for any non-compliance with the EMPr and will pay for any remedial work that may result from non-compliance resulting directly from his/her negligence. Failure to comply with the EMPr is addressed in Section 2.2.3.

Responsibilities		Duration
Approvals and licences	• Ensure that a copy of the EMPr, EA and any other applicable permit/licence are available on site.	Pre-construction; Project lifespan
Communication	• Submit all required documentation (e.g. proof of training, method statements, layout plans, and requests for deviations) to the ECO on a timely basis. • Communicate any issues or concerns of the surrounding community regarding the development to the ECO or other responsible party and visa-versa. • Ensure that all materials and equipment required for daily environmental compliance is ordered through the correct channels if such is not available.	Pre-construction; Project lifespan
Site management	• Ensure that appointed contractors, participants and sub-contractors are familiar with the EMPr and that they abide by it. • Monitor and verify on a daily basis that the EMPr and specifications (if applicable) is adhered to at all times and taking the necessary action to ensure compliance is achieved where it is lacking. • Ensure that site demarcation and no-go areas are maintained. • Monitor and verify that environmental impacts as a result of construction activities are kept to a minimum. • Ensure that all materials and equipment required for daily environmental compliance are available on site and ensure that the aforementioned is ordered through the correct channels if such is not available. • Inspect the site and surrounding areas regularly with regard to compliance with the EMPr. • Keep a photographic record of progress on site from an environmental perspective.	Project lifespan
Environmental training	• Provide environmental awareness training for all new personnel coming onto site and filing proof of such training in the Environmental File on site.	Pre-construction
Method Statements	• Ensure compliance with approved Method Statements.	Pre-construction; Project lifespan

Responsibilities		Duration
Record keeping	• Submit all required documentation (e.g. proof of training, method statements, layout plans, and requests for deviations) to the ECO on a timely basis. • File proof of environmental awareness training in the Environmental File kept on site. • Keep and maintain a detailed incident (including spillage of fuels, chemicals, or any other material) and complaints register on site indicating how these issues were addressed, what rehabilitation measures were taken and what preventative measures were implemented to avoid re-occurrence of incidents/complaints. • Ensure that all relevant documentation illustrating or proving environmental compliance are filed on site in the Environmental File for inspection by the ECO or Competent Authority. • Keep a photographic record of progress on site from an environmental perspective.	Project lifespan
Audits	• Complete start-up and site closure checklists on a weekly or monthly basis or as otherwise specified.	Project lifespan

2.2 Record keeping (site related activities)

The development of an EMPr for a project is an important and necessary task that is aimed at assigning responsibilities and mitigation options to a variety of activities. However, it can be an ineffective tool in the absence of auditing or monitoring activities. Auditing or monitoring activities involve the structured observation, measurement, and evaluation of environmental data over a period of time.

2.2.1 Site Environmental File

The Site Environmental File (SEF) is a critical part of compliance record keeping, specifically in terms of proof of activities undertaken on a regular basis on site to ensure compliance with the EA and EMPr. The SEF is further a key component to demonstrate compliance to the ECO or relevant Competent Authority official during a compliance audit. The typical SEF contents should include *inter alia* the following:

1. **Rehabilitation Plan and EMP**

2. **Approvals and licences**
   2.1. EA
   2.2. Section 21(c) and (i) General Authorisation
   2.3. Waste licence (if applicable)
   2.4. Mining permit/licence (e.g. for proof of quarry legitimacy)

3. **Communication**
   3.1. Important correspondence e.g. notice to Competent Authority of commencement of construction
   3.2. Copy of public complaints register

4. **Site management**
   4.1. Approved layout
   4.2. Site instructions (or copies thereof)

5. **Environmental Training**
   5.1. Proof of toolbox talks, environmental awareness and induction (incl. attendance register and training material)

6. **Method statements**
   6.1. Approved method statements

7. **Records**
   7.1. Record of waste generation – quantity, type, fate (incl. general/hazardous, liquid/solid)
   7.2. Proof of legal/safe waste disposal
   7.3. Record of chemicals on site and Material Safety Data Sheets (MSDS)
   7.4. Record of water usage (if applicable)
   7.5. Log of topsoil samples (if applicable)

8. **Audits**
   8.1. ECO audit reports
   8.2. Internal audits/check conducted by the Implementing Entity
   8.3. Incident and non-conformance reports

Typical examples of checklists and other types of record keeping are included in Annexure B.

2.2.2 Progress / Site Meetings

Environmental issues shall be put on the agenda as a discussion point during these meetings. The Implementer, or a designated person involved with environmental issues on the project, shall attend the progress and/or site meetings on a regular basis to provide feedback on any outstanding or contentious environmental matter.

2.2.3 Failure to comply with the EA and EMPr

The WfWetlands Programme, as the holder of the Environmental Authorisation, is responsible for ensuring compliance with the conditions by any person acting on their behalf including Implementing Entities. The EA holder must notify the DEA in writing within the period specific in the EA if any condition in the Environmental Authorisation is or cannot be complied with. Upon receiving such notification the DEA (Compliance Directorate) will assess the reported non-conformance and inform the EA holder of further actions and submissions required.

In addition to the above, the ECO may order the Implementing Entity to suspend part or all of the works if, based on the ECO's reasoned opinion, the Implementing Entity has, is in the process of or will cause significant environmental damage and/or cause a non-conformance to the EA and/or EMPr. The ECO shall report this instruction to the WfWetlands' *Deputy Director: Programme Implementation* **within 24 hours** of the instruction being issued. Should the aforementioned suspension of work be as a result of negligence or actions by the Implementing Entity, no extension of time will be granted for such delays and all costs will be borne by the Implementing Entity. Apart from direct non-compliance with the EA or EMPr, the following will be regarded as indirect non-compliance:

- Failure to comply with corrective or other instructions issued by the Implementing Entities, ECO or Competent Authority within a specified time.
- Failure to produce the supporting documentation proving compliance with the EA or EMPr.
- Failure to ensure that sub-contractors appointed by the Implementing Entity comply with the EA and EMPr.

3 PRECONSTRUCTION/PLANNING PHASE

3.1 Compliance with environmental legislation

Ensure relevant approvals from regulatory authorities are obtained, in particular in terms of:

- National Environmental Management Act (No. 107 of 1998) (NEMA), as amended;
- National Water Act (No. 36 of 1998);
- National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004);
- National Forests Act (No. 84 of 1998);
- National Heritage Resources Act (No. 25 of 1999); and
- Other provincial and local environmental legislation.

3.2 Submission of method statements

- Method Statements must be compiled by the Implementing Entity.
- All Method Statements must be submitted and approved prior to site establishment commencing.
- The content and required actions of the Method Statements must be communicated to site staff through a compulsory environmental induction.
- Approved Method Statements will be dated and signed by all relevant parties (Implementing Entity, ECO, DEA, Engineer).
- Should a Method Statement need to be revised, a formal revision will be issued, signed and dated. The updated Method Statement will be filed in the SEF.
- The submitted Method Statements (see Annexure B) will include but not be limited to:
    - Site division, demarcation and no-go areas (incl. site camp establishment, access, construction working widths).
    - Site clearance and topsoil management.
    - Stockpiling and laydown areas.
    - Solid waste management (general and hazardous, incl. disposal).
    - Hazardous substances storage and management.
    - Contaminated water management and disposal.
    - Cement storage and handling as well as concrete batching.
    - Fuel storage and management.
    - Ablution facilities and eating areas.
    - Dust and noise/nuisance control.
    - Protection of flora, fauna and natural features.
    - Stormwater management and erosion.

- Site de-establishment and rehabilitation.

- The submission of a site layout plan (see Annexure B) by the IE to the ECO for approval is compulsory. The layout plan must indicate all areas of relevance including *inter alia*:
  - The location of the site camp as well as the site camp layout indicating the location of materials storage (general and hazardous), fuel storage, the site office, ablution facilities, vehicle/machinery parking areas.
  - Access to the site camp and intervention sites.
  - Any required stormwater management measures such as diversion berms, cut-off drains, silt fences etc.
  - Stockpiling and laydown areas.
  - Concrete/mortar mixing/batching areas.
  - No-go or sensitive areas.
  - Limit(s) of the construction footprint.

The layout plan must take into consideration the buffer distances and restrictions as specified in the EMPr. Where applicable[22] the IE must make use of multiple layout plans to indicate the location of the abovementioned areas.

3.3 Environmental induction/training

Training and induction forms an integral part of ensuring and maintaining compliance with the EA and EMPr. Every person on site needs to understand the importance of compliance with the EA and EMPr and their specific role(s) in achieving this. Environmental induction and/or training must be specific or relevant to the level of responsibility of the person receiving the training. Environmental training and/or induction shall comply with the following requirements:

- The Implementing Entity and any other staff with management responsibilities (e.g. HSE officer and the foreman) will undergo environmental compliance training prior to construction commencing. The induction/training shall include project specific requirements for compliance with the EA and EMPr and responsibilities assigned to each party.
- Once the Method Statement is approved, a copy of the Method Statement must be circulated and communicated to the responsible parties (see Section 3.2).
- General staff will receive a simplified environmental induction and/or training before the commencement of construction (i.e. site establishment). The induction/training shall address, but not be limited to, basic environmental awareness, basic health and safety awareness, prevention of water, soil, and air pollution, prevention of soil erosion and sedimentation, basic principles of materials handling and storage, fire risks, protection of fauna and flora, removal of invasive alien species (if relevant), emergencies and incident responses, spill response provisions, social responsibility, and administrative and reporting procedures.
- All project personnel shall further be trained in basic wetland awareness, including a basic understanding of the components of wetlands, how wetlands function, the benefits they provide,

[22] Where the “site” covers an extensive area or where a large number of interventions are to be constructed.

why they need to be conserved and used sustainably, and the importance of rehabilitation in contributing to wetland conservation and sustainable use.

- Where work takes place in areas containing dangerous game, especially nature reserves and national parks, participants shall receive training in basic animal behaviour. A person trained in dangerous animal behaviour shall be present and suitably equipped to deal with such threats at all times. Before work commences each day, the site shall be checked for dangerous animals by the trained person. First aid training shall include current treatments for snakebites.
- Provision must be made for quarterly refresher environmental training to be undertaken during the course of the contract. The Implementing Entity shall ensure that all attendees sign an attendance register, and shall provide the Implementer with a copy of the attendance register the day after each course.
- Daily/weekly *Toolbox Talks* should include an environmental topic/issue in addition to a Health and Safety topic/issue.
- Proof (training material, attendance registers, photos) of training and attendance to be filed in SEF.
- Include environmental considerations as an item on the agenda of the monthly site meetings.

4 CONSTRUCTION PHASE

4.1 Compliance with the EA and successful implementation of EMPr, environmental specifications and other permits/licences

Identified impacts: The EA, EMPr and other relevant permits and licences are only of value if the conditions/requirements contained in them are adhered to. As these documents are legal documents, non-conformance in terms of adherence/implementation may constitute an offence and be subject to suspension of the authorisation/permit/licence and possible penalties or fines.

Objective of improved management:

- Continued and consistent compliance with the EA and EMPr as well as environmental specifications and other permits/licences

Specifications:

- The ECO shall be responsible for the implementation of this EMPr for the duration of the construction phase and until rehabilitation is completed.
- The ECO shall have full access to the site at all times.
- Audits[23] undertaken by the ECO shall comply with the requirements of GN R982 (2014, as amended).
- Although the EA/licence/permit holder can transpose contractual liabilities to the Implementing Entity in terms of compliance with the EA, EMPr, Environmental Specification and any other relevant permits/licenses, the EA/licence/permit holder will remain legally liable in terms of compliance.

Table 2: Compliance with the EA and successful implementation of EMPr, environmental specifications and other permits/licences

Management Measure	Detailed Description	Responsibility
Avoidance	• A copy of the EA, EMPr, Environmental Specifications and any other relevant permits/licenses will be kept in the SEF on site. • The Implementing Entity will familiarise himself/herself with the contents and requirements of the EA, EMPr, Environmental Specifications and any other relevant permits/licenses.	Implementing Entity, EA holder, ECO

[23] The ECO is responsible for providing an independent evaluation of compliance with the EMPr and not for enforcement of the conditions of the EMPr. The responsibility of enforcement of the conditions of the EMPr lies with the EA holder.

Management Measure	Detailed Description	Responsibility
	• The Implementing Entity and/or EA holder will not knowingly proceed with any action which might compromise compliance with the EA, EMPr, Environmental Specifications or any other relevant permits/licenses.	
Mitigation	• Should a situation arise where compliance with the EA, EMPr, Environmental Specifications or any other relevant permits/licenses is likely to be compromised/deviated from due to exceptional circumstances or a change in scope of work, the Implementing Entity will notify the ECO immediately. The ECO will assess the type of deviation and its significance and will advise the Implementing Entity whether the deviation requires an amendment to the EA, EMPr, Environmental Specifications or any other relevant permits/licenses.	Implementing Entity, EA holder, ECO
Stop work	• Should a situation arise where there is accidental or intentional non-conformance with the EA, EMPr, Environmental Specification and any other relevant permits/licenses, the ECO may order all work to stop until such non-conformance has been assessed, reported to the relevant authority (if necessary) and appropriately mitigated • A non-conformance will be recorded in writing by the ECO with a description (and photographic evidence where applicable) of the incident/non-conformance. A non-conformance report will contain detailed actions and action dates for each responsible party and will be signed off by the ECO and IE once completed/closed out.	Implementing Entity, EA holder, ECO
Monitoring method and frequency	• Daily/weekly monitoring by Implementing Entity. • Formal monthly audits by ECO.	Implementing Entity, EA holder, ECO
Management outcomes	• Full and continued compliance with the EA, EMPr, Environmental Specifications and any other relevant permits/licenses. • Identification of possible deviations in advance to avoid non-conformances. • Independent and impartial monitoring of compliance by the ECO.	Implementing Entity, EA holder, ECO

4.2 Site establishment

Identified impacts: Site establishment can often have a significant environmental impact in terms of vegetation clearance and/or the construction footprint and therefore needs to be carefully managed. It is also usually during site establishment that the site camp and laydown areas are identified and demarcated. If the aforementioned is not properly planned, it could have several secondary impacts such as water pollution, soil contamination, erosion and excessive dust.

Objective of improved management:

- To avoid excessive disturbance in terms of vegetation clearance and the construction footprint.
- Ensure that activities/facilities/site structures with pollution potential are located outside buffer zones and no-go areas, preferably in already disturbed or transformed areas. Examples include the site camp, material laydown areas, concrete batching plant, ablution facilities etc.
- Ensure that all activities remain within the approved construction footprint.

Specifications:

- Site establishment will not commence until such time that the EA appeal period has passed and will further be subject to the approval of the required method statements by the ECO.
- The wetland boundary shall be demarcated on the site plan and on site.
- Demarcation will be by means of brightly painted/white pegs/poles at least 1.5m in height and placed at regular (10m for linear of on every corner for non-linear) intervals on both sides of the approved construction footprint. **Demarcation shall be maintained for the duration of construction.**
- Danger tape and/or snow/barrier netting shall only be used for health and safety requirements along excavations or high risk areas.
- All areas outside approved and demarcated footprint are to be treated as no-go areas.

Table 3: Specific avoidance, mitigation and cessation management measures related to impacts identified with site establishment

Management Measure	Detailed Description	Responsibility
Avoidance	• The Implementing Entity must prioritise the use of disturbed areas for site camp establishment, laydown areas and stockpile areas. • The site camp shall be clearly demarcated and fenced subsequent to approval of the ECO.	Implementing Entity

Management Measure	Detailed Description	Responsibility
	• The site camp, laydown and stockpile areas may not be established within any environmentally sensitive area. Refer to Annexure C for sensitivity and wetland boundary map. • Should an extension/amendment to the construction footprint be required, the Implementing Entity must submit such a request to the ECO for approval prior to extending the construction footprint. • All work will be executed within the approved working area. • Temporary laydown areas will not be used for a period exceeding four (4) weeks and must be approved by the ECO prior to being used. • Temporary laydown areas must be demarcated should it fall outside the approved construction footprint. • The Implementing Entity is to ensure that all staff (e.g. plant operators, general workers) are informed of no-go areas as part of the induction/environmental awareness training.	
Mitigation	• Should the Implementing Entity disturb an area outside the approved footprint, then the Implementing Entity will be held liable to reinstate the impacted area to its original condition. • All temporary footprint areas must be reinstated/rehabilitated at the end of construction.	Implementing Entity
Stop work	• Should the Implementing Entity fail to remain within the approved construction footprint or intentionally/negligently cause damage to a natural feature in a no-go area, the ECO reserves the right to suspend or partially suspend construction via written instruction in order to allow for the assessment, reporting and rectification of the impact. • The aforementioned will be determined by the type and significance of the non-conformance and the risk of it reoccurring should construction proceed.	ECO, Engineer
Monitoring method and frequency	• Daily and weekly monitoring/inspections by the Implementing Entity. • Formal monthly audits by the ECO.	ECO, Implementing Entity

Management Measure	Detailed Description	Responsibility
Management outcomes	• Method Statements are submitted at least 14 days prior to the commencement of site establishment. • Site establishment only commences after approval of the Method Statements. • Already disturbed areas are prioritised for site camp, laydown and stockpile areas. • Construction footprint and vegetation clearance is controlled and kept to a minimum. • Activities are restricted to within the approved construction footprint. • Demarcation remains visible and in place for the duration of construction.	Implementing Entity, EA holder, ECO

4.3 Channels of communication for public complaints

Identified impacts: The construction activities could lead to nuisance impacts and impacts on the adjacent properties. This may result in complaints from the public and/or adjacent landowners

Objectives of improved management:

- To record and address (within a reasonable timeframe) any complaints by the public arising from the construction activities and the impacts thereof.

Specifications: None

Table 4: Specific avoidance, mitigation and cessation management measures related to impacts identified with public complaints

Management Measure	Detailed Description	Responsibility
Avoidance	• The IE must contact the landowner and/or occupier of the land where the construction is to take place at last 10 working days prior to moving onto site. • The IE must confirm the procedure to be followed for access including gates which must remain locked or open. • The Implementing Entity must ensure that the site remains neat and that no littering occurs. • Ensure that the public and adjacent landowners are informed well in advance of any construction activities to take place in the vicinity of their properties. • Where the site is located in a nature reserve/park, the Implementing Entity must familiarise him/herself with the rules and regulations of the reserve/park and where necessary include such information in the environmental induction and training. • Where the site is frequently visited by tourists, the Implementing Entity must ensure that his/her site does not cause a visual or noise disturbance. • Also refer to the Code of Conduct attached under Annexure A.	Implementing Entity
Mitigation	• Provide a contact number of person responsible for the site on the site signage. • Maintain a complaints register on site to allow public complaints to be recorded.	Implementing Entity

Management Measure	Detailed Description	Responsibility
	• Verbal complaints must be recorded within 24 hours of being received with a copy provided to the complainant. • Actions to address the complaints must be recorded in writing with sign-off by the ECO once the actions have been completed. • Address all complaints within a reasonable timeframe (24 hours for initial contact and 5 working days to resolve minor issues or complaints). • Ensure that actions are recorded in the SEF and the actions are implemented to avoid the future complaints regarding the same issue.	
Stop work	• Should a complaint relate to an action by the Implementing Entity which can cause/has caused a serious health and safety or environmental impact, the ECO may suspend or partially suspend work via instruction from the Engineer in order to assess the impact/complaint and identify any remedial actions required.	ECO
Monitoring method and frequency	• Reporting of serious complaints within 24 hrs to the ECO. • Address all complaints within a reasonable timeframe (24 hours for initial contact and 5 working days to resolve minor issues or complaints). • Ensure that all complaints are recorded in the complaints registered and that remedial actions are recorded, implemented and maintained. • Daily and weekly monitoring/inspections by the Implementing Entity. • Formal monthly audits by the ECO.	Implementing Entity, ECO
Management outcomes	• The public is timeously informed of construction activities which might impact them. • Contact details of the Implementing Entity is visible on site signage at the site camp. • A register is available at the site camp to record any community/public complaints.	Implementing Entity, ECO

Management Measure	Detailed Description	Responsibility
	• All public complaints are recorded and closed out within a reasonable timeframe (24 hours for initial contact and 5 working days to resolve minor issues or complaints). • Repeat complaints regarding the same matter/issue are avoided.	

4.4 Vegetation clearance

Identified impacts: Various activities that take place during the construction phase require the removal of vegetation, including clearing of the construction footprint for construction activities, site camp establishment, laydown and stockpile areas and access roads.

Objective of improved management:

- To retain natural vegetation in terrestrially sensitive areas.
- To minimise the extent of disturbance of vegetation/habitats on-site.
- Avoid the loss of species of conservation concern.

Specifications:

- Vegetation clearance must be restricted to the approved construction footprint.
- Removal of vegetation must occur at increments and must only be done up to two weeks ahead of actual construction commencing in an area.
- No burning of vegetation will be allowed.
- Where vegetation consists of grasses, bulbs and shrubs, it will be cleared (i.e. complete removal of the vegetation with its root system) as part of the removal of topsoil (i.e. to a maximum depth of 30cm) in order to maximise organic content and the available seedbank in the topsoil.
- Where vegetation consists predominately of reeds, the reeds will be slashed/cut to 30cm in height, measured from ground level, with the remainder of the plant and its root/rhizome system removed with the topsoil layer (i.e. at a maximum depth of 30cm).
- Vegetation/ plant material is not allowed to be disposed of as waste at a landfill site and should be stored for mulching purposes upon completion of the construction works.

Table 5: Specific avoidance, mitigation and cessation management measures related to impacts identified with vegetation clearance

Management Measure	Detailed Description	Responsibility
Avoidance	• Limit vegetation clearance in “sensitive areas” as identified in the BAR and as indicated on the maps under Annexure C. • Prioritise the use of already disturbed and degraded areas for site camps, laydown and stockpiling areas.	Implementing Entity, ECO

Management Measure	Detailed Description	Responsibility
	• Do not remove/clear vegetation outside the approved construction footprint. • Ensure that site demarcation is maintained throughout the construction phase. • Clearly mark shrubs and trees which should not be disturbed/damaged during construction. • Remove/relocate species of conservation concern where possible and practical.	
Mitigation	• Ensure that all temporary footprint areas are rehabilitated at the completion of construction in a specific area. • Ensure that topsoil is removed and conserved in order to ensure successful revegetation/rehabilitation (also see Section 4.5). • Any area disturbed outside the approved construction footprint must be reinstated at the Implementing Entity's cost to the satisfaction of the ECO. • Ensure that sufficient funds are allocated in the BoQ for rehabilitation of temporary footprints.	Implementing Entity, ECO, Engineer
Stop work	• Should the Implementing Entity fail to remain within the approved construction footprint or intentionally/negligently cause damage to a natural feature/vegetation in a no-go area, the ECO reserves the right to suspend or partially suspend construction via instruction from the EA holder in order to allow for the assessment, reporting and rectification of the impact. • The aforementioned will be determined by the type and significance of the non-conformance and the risk of it reoccurring should construction proceed.	ECO, Engineer
Monitoring method and frequency	• Daily and weekly monitoring/inspections by the Implementing Entity. • Formal monthly audits by the ECO.	Implementing Entity, ECO
Management outcomes	• Work is contained to the approved construction footprint. • Site demarcation is maintained for the duration of construction.	Implementing Entity

Management Measure	Detailed Description	Responsibility
	• Vegetation clearance is limited in sensitive areas. • No site camps, laydown or stockpile areas in sensitive areas. • Plants of conservation concern are relocated where possible and feasible (with the necessary permits/licences/approvals in place). • Temporary footprint areas are rehabilitated once work in an area has been completed. • Topsoil is removed and managed properly (see Section 4.5 below) to aid in successful rehabilitation.	

4.5 Topsoil management

Identified impacts: Topsoil is an essential component to achieve successful rehabilitation/revegetation of a disturbed area. Poor topsoil management practices such as double handling, compaction, contamination, erosion and failing to control weeds/alien invasive species on stockpiles all contribute to the degradation and loss of topsoil. This in turn compromises the success of rehabilitation or results in additional costs to improve or import topsoil.

Objective of improved management:

- To ensure that topsoil is properly removed and managed during construction in order to enable successful rehabilitation at the completion of construction.

Specifications:

- Topsoil must be removed to a maximum depth of 30cm.
- Where the topsoil layer is shallow or alternating in depth, it must be removed to the maximum depth possible.
- Topsoil removal must occur at increments and will only be done up to two weeks ahead of actual construction commencing in an area.
- Topsoil will be removed with the appropriate equipment i.e. pointed or flat tip shovel/spade and a wheelbarrow.
- Topsoil stockpiles must be stored on level areas to a maximum height of 1.5m. The stockpile areas will be properly planned and will be approved as part of the site demarcation process and will be indicated on the site layout plan.
- Stockpiles will not block access routes or endanger any person or animal.
- The stockpiles must be protected from erosion and contamination by subsoil or imported materials.
- Topsoil will not be driven over or compacted and stockpiles will not be reworked or moved unnecessarily.
- Topsoil stockpiles must be kept free of weeds for the duration of construction until reapplied during rehabilitation.
- Topsoil will only be reapplied after all civil work has been completed in order to avoid compaction.

Working in peat wetlands:

Some of the wetlands identified for priority rehabilitation may occur in soils with a high organic composition, known as peat. These soils hold huge importance globally due to their nature to hold high levels of carbon (known as carbon sequestration). The following considerations should be made for site clearance in peatlands:

- Work shall only be done in periods with low rainfall (Winter rainfall areas - November to March and Summer rainfall areas - May to September).
- No material will be removed from the peatland for construction purposes e.g. boulders, rocks, sand.
- All access to the intervention site in the peatland will be by foot, no vehicles will be allowed in the peatland.
- Where materials need to be transported into the peatland, it will be done by means of wheelbarrows on demarcated walkways lined by wooden planks, geotextile or similar material.
- The Implementing Entity will use only one access path/point per Intervention Point and will not create multiple access paths or points.
- No foreign vegetable matter (e.g. mulch) may be brought into the wetland area (especially from alien species).
- Topsoil shall be removed specifically in the form of sods (20 to 20cm (length) x 20cm (width) x 20cm (depth)):
    - The first sod shall include the roots/rhizome layer (i.e. the rootstalks and their associated nodes/tubers)
    - The sods shall be stored in a wet area, on site, in their original orientation and order.
    - Vegetation can be cut short if it will make it easier to handle the sods.
    - Soil shall be stockpiled according to the different soil layers (i.e. in separate stockpiles) as per the soil profile. Where possible, soils shall be stockpiled as high as possible to retain moisture, but not higher than 0.5m.
    - Stockpiles will be located in a saturated area with shallow surface water immediately adjacent to the Intervention Point. Sods will be placed on the existing vegetation. Where vegetation height exceeds 30cm, the vegetation can be cut and used as mulch/cover layer.
    - The stockpile area will be indicated by means of painted pegs at each corner.
    - Stockpiles shall only be handled twice i.e. during removal and during placement for rehabilitation.
    - Stockpiles shall be covered with 10cm mulch or cloth (geotextile with <0.5cm aperture) to ensure that the moisture content is maintained by restricted evaporation and evapotranspiration.

Table 6: Specific avoidance, mitigation and cessation management measures related to impacts identified regarding topsoil management

Management Measure	Detailed Description	Responsibility
Avoidance	• Ensure topsoil is stockpiled in areas on site where opportunity for compaction and contamination due to other construction activities are limited. • Avoid moving/handling the topsoil more than twice (i.e. restricted to initial stripping and final reapplication). • Ensure weeds and alien invasive species are removed from the stockpiles prior to reaching seed formation stage. • Do not move topsoil between different areas on site i.e. it should be reapplied in the same area that it was removed from.	Implementing Entity
Mitigation	• Remove more than 15cm of topsoil where possible to compensate for areas of shallow/no topsoil as well as topsoil loss due to mismanagement. • Apply mulch to the topsoil if the topsoil quality has been impacted significantly and will compromise the success of revegetation (based on the reasoned opinion of the ECO or wetland specialist). • Enforce a stricter and more frequent weeding/alien invasive removal regime where there was failure to remove weeds/alien invasive species from topsoil stockpiles prior to seed formation stage.	Implementing Entity, ECO, Engineer
Stop work	N/A	
Monitoring method and frequency	• Use of approved site layout to confirm correct location of topsoil stockpiles. • Continuous monitoring during initial topsoil removal/stripping. • Weekly to bi-weekly monitoring of stockpiles for signs of erosion and weeds. • Monthly audits for general topsoil management practices.	Implementing Entity, ECO
Management outcomes	• Topsoil is removed to a minimum depth of 15cm. • Topsoil is not contaminated by other materials.	Implementing Entity

Management Measure	Detailed Description	Responsibility
	• There is no compaction of topsoil. • Topsoil is not eroded or washed away. • Handling of topsoil is restricted to initial removal and final reapplication. • The topsoil applied during rehabilitation matches the quality and thickness of topsoil removed during site clearance. • Weeds and alien invasive species on topsoil stockpiles are removed on a regular basis prior to the plants reaching seed formation stage.	

4.6 Materials management (non-hazardous)

Identified impacts:

- Material delivered to areas not approved by the ECO and Engineer e.g. outside the approved construction footprint, on steeply sloped areas, etc.
- Imported materials introduce new alien invasive species to site.
- Materials spilling from vehicles causing a safety or pollution risk.
- Materials are eroded and washed into wetland systems as a result of being stockpiled in areas with concentrated stormwater runoff or on sloped areas.
- Materials are mixed with the underlying natural ground surface causing contamination of soil, excessive quantities of material remaining on site after construction, localised plant die-off, increase in sedimentation etc.
- Wetland systems are impacted and/or polluted due to an insufficient buffer width between site camps, laydown and stockpile areas and water resource.
- Materials susceptible to wind erosion results in a dust nuisance and contamination of surrounding areas.
- Materials are stored on site for extended periods leading to the need for increased storage area due to materials not being used.

Objectives of improved management:

- Ensure material delivery and storage takes place in such a manner that it does not cause pollution or degradation of the surrounding environment.
- Plan material use and delivery in order to ensure that material storage on site does not take place for extended periods of time (i.e. > 4 weeks).
- Minimise the use of intact/undisturbed areas for material stockpiling/storage.
- Minimise exposure of materials to wind and water erosion.
- Ensure that materials are stored on site for the shortest possible period to limit the extent of areas required for storage and stockpiling.

Specifications: None

Table 7: Specific avoidance, mitigation and cessation management measures related to impacts identified with materials management (non-hazardous)

Management Measure	Detailed Description	Responsibility
Avoidance	• It will be the Implementing Entity's responsibility to ensure that delivery drivers/suppliers are aware of the relevant EMPr requirements. • The Implementing Entity shall ensure that materials are sourced from legal and approved sources. If unsure the Implementing Entity will obtain permission from the ECO prior to using a certain material resource. • Imported materials shall be free of weeds, litter and contaminants. • Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to, sand, stone chip, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent them spilling from the vehicle during transit. The Implementing Entity shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials. • The Implementing Entity will identify appropriate storage and laydown areas prior to delivery to site. The areas will be approved by the ECO either as part of the required Method Statement or on an *ad hoc* basis. • Open, disturbed areas will be prioritised for stockpiling and laydown areas. • Bulk stockpile areas will be outside the wetland boundary and any other areas prone to seasonal flooding unless otherwise approved by the ECO. • The Implementing Entity will schedule the delivery of materials in such a manner that it does not require excessive periods (>4 weeks) of on-site storage unless otherwise approved by the ECO e.g. where delivery/source distances are excessive. • Minor stockpiles (not covering an area exceeding 4m^2 unless otherwise approved by the ECO) will be allowed next to an Intervention Point for specific use at the Intervention Point. • Minor stockpiles next to intervention sites will be utilised within 2 weeks of the material being stockpiled i.e. it will not be left adjacent to a planned or completed Intervention Point for an excessive period of time.	Implementing Entity

Management Measure	Detailed Description	Responsibility
	• Laydown and storage areas where such occurs on vegetation, topsoil or in a wetland shall be on hessian, PVC sheeting or a similar material in order to separate the imported material from the vegetation/topsoil and to ensure easy and proper removal of excess material. • Stockpile heights will be limited to 1.5m where the material is fine (i.e. susceptible to wind erosion) or in areas known to regularly (weekly to fortnightly basis) experience wind speeds exceeding 20km/h. Alternatively, material which can be windblown will be covered with shade cloth, PVC sheeting, hessian or similar suitable material. • Stockpile areas will be flat and not subject to concentrated stormwater runoff or surface water flow. • Materials such as precast pipes and culverts, gabions baskets, MacMat-R, hessian etc. can be placed directly on vegetated areas to avoid the disturbance and clearance of vegetation and topsoil. This will be at the discretion of the ECO based on the merits of avoiding vegetation and topsoil removal.	
Mitigation	• Should material be washed or blown into the surrounding environment, the Implementing Entity will be responsible for the removal/recovery of such material. Whether removal/recovery is required will be determined by the ECO based on the type of material, volume of material and whether the material can be recovered/removed without causing substantial additional degradation of the surrounding environment. • Materials not used at a specific Intervention Point will be removed once the activity requiring the material has been completed e.g. stones for gabions. • Where sand/fill material is legally sourced from a dam, existing borrow pit or similar with clear presence of invasive alien species, the Implementing Entity will allow for a weeding programme at the on-site stockpile area and Intervention Point. The weeding programme will span a winter and summer period consecutively to ensure that introduced invasive alien and weed species are removed prior to seed formation stage. • All remaining/waste material will be removed off-site before or by the end of construction.	Implementing Entity
Stop work	N/A	

Management Measure	Detailed Description	Responsibility
Monitoring method and frequency	• Daily and weekly monitoring/inspections by the Implementing Entity. • Formal monthly audits by the ECO.	Implementing Entity, ECO
Management outcomes	• Imported materials are stored/stockpiled on already disturbed areas within the approved construction footprint. • Material delivery and storage takes place as in such a manner that it does not cause pollution or degradation of the surrounding environment. • Materials are not eroded and/or deposited in the surrounding environment. • Materials are used within four weeks of delivery. • No new or additional alien invasive species are introduced via imported material. Where such are imported, the Implementing Entity implemented a weeding programme spanning at least one winter and one summer i.e. a year. • All imported material is removed from site at the completion of construction.	

4.7 Hazardous chemicals and potential hazardous substances

Identified impacts:

- Includes, but are not limited to: drums of fuel, grease, oil, brake fluid, hydraulic fluid, paint, batteries and herbicides (for alien plant clearing), etc.
- Spills resulting in pollution of nearby aquatic systems and water resources.
- Spills resulting in soil contamination and degradation.
- Fauna and/or (indigenous) flora fatalities/die-off.
- Illegal/improper disposal of materials contaminated with hazardous product/spill.

Objectives of improved management:

- Ensure the controlled and documented management of hazardous chemicals and substances.
- Avoid and minimise spillages through proper storage and dispensing practices.
- Ensure that the appropriate mitigation measures are in place in the event of a spill.
- Ensure that hazardous materials are stored in designated/approved areas away from sensitive receptors/environments.

Specifications:

- The Implementing Entity must supply the ECO with a list of all hazardous materials that would be present on site during the construction period.

Table 8: Specific avoidance, mitigation and cessation management measures related to impacts identified with hazardous materials management

Management Measure	Detailed Description	Responsibility
Avoidance	• All hazardous materials and products must be stored in containers marked as per SANS 10234 requirements i.e. in its original container. • All containers will have lids and stored in a covered and bunded area or in a flammables/hazardous store with a metal drip tray able to contain 110% of the volume of the largest container.	Implementing Entity

Management Measure	Detailed Description	Responsibility
	• A register of hazardous materials and products will be kept at the site officer or flammables/hazardous store together with up to date Material Safety Data Sheet (MSDS). • Containers with a volume of more than 20ℓ will have proper dispensing equipment. • Dispensing of hazardous materials into smaller containers or equipment will only occur at the site camp on a lined or impermeable surface. • Hazardous materials and products will only be stored at the site camp.	
Mitigation	• The Implementing Entity must ensure that there is an emergency procedure in place to deal with accidents and incidents (e.g. spills) arising from hazardous substances. • The Implementing Entity must ensure that all personnel on site are properly trained concerning the proper use, handling and disposal of hazardous substances. • The Implementing Entity must report major incidents to the ECO immediately. Any spill incidents must be cleaned up immediately and in according with the emergency procedure	Implementing Entity
Stop work	• Should the Implementing Entity through negligent or wilful action/behaviour cause a significant/major spill or dispose of hazardous materials illegally, the ECO reserves the right to suspend or partially suspend construction via instruction from the EA Holder in order to allow for the assessment, reporting and rectification of the impact. • Depending on the severity of the non-conformance, the ECO will also inform the relevant competent authority to confirm the Implementing Entity's liability to be prosecuted and/or fined.	ECO, EA Holder
Monitoring method and frequency	• Visual inspection. • Immediate response to spillage. • Completion of an incident form for major spillages (>5ℓ). • Reporting of major spills within 24 hrs to the ECO.	Implementing Entity, ECO

Management Measure	Detailed Description	Responsibility
	• Daily and weekly monitoring/inspections by the Implementing Entity. • Formal monthly audits by the ECO.	
Management outcomes	• Hazardous materials are properly managed including recording keeping, storage, dispensing and disposal. • Spillages are avoided and minimised through proper storage and dispensing practices. • All personnel on site are properly trained concerning the proper use, handling and disposal of hazardous substances. • The Implementing Entity has a designated and trained individual on-site to respond to spills on site. • Spillages are removed/cleaned/treated immediately after occurring. • Ensure that the appropriate mitigation measures are in place and implemented in the event of a spill. • Hazardous materials are stored in designated/approved areas away from sensitive receptors/environments. • Spills are reported to the ECO within 24hrs of occurring. • Spilled hazardous product and materials used for clean-up are stored and disposed of as hazardous waste or collected by a registered service provider.	Implementing Entity, ECO

4.8 Contamination of soils and water

Identified impacts: Soil and water can be contaminated or polluted by construction activities via several pathways. In terms of soil contamination, pollution can result in the soil being unsuitable for certain land uses and it can also indirectly contribute to sustained pollution of both surface and groundwater resources. The pollution of water resources can lead to numerous direct and indirect impacts including the following:

- Water becoming unsuitable for certain uses such as human consumption and certain agricultural activities due to a decline in water quality.
- A loss of aquatic biodiversity through a change in species composition and diversity and/or species die-off in reaction to a decline in water quality.
- An increase in alien invasive fauna and flora species as a result of higher tolerance capacity in terms of water quality changes/deterioration.
- Increased costs of treating contaminated water for human consumption.

Objective of improved management:

- To conduct/manage construction activities in such a manner that the contamination of soil and water resources is avoided and/or minimised.

Specifications: None

Table 9: Specific avoidance, mitigation and cessation management measures related to impacts identified regarding contamination of soil and water

Management Measure	Detailed Description	Responsibility
Avoidance	• Ensure that all equipment, machinery and vehicles are in good working order. • No maintenance will take place on site and broken equipment, machinery and vehicles must be removed off-site within 24 hours of the breakdown. • Use drip trays for all stationary or parked equipment, machinery and vehicles showing signs of leakage. • Ensure that substances that pose a risk of water/soil contamination are appropriately stored and disposed of (also refer to Section 4.7). • Site camps are not allowed in a wetland. • Hazardous materials storage areas are not allowed within 100m of watercourses.	Implementing Entity

Management Measure	Detailed Description	Responsibility
	• Concrete mixers may only operate on a stable, level site. • Concrete shall be mixed on trays or other suitable lining material to prevent contamination of the soil and/ or waterbodies. • Ensure that minor mixing of concrete and mortar is done on impermeable surfaces or in wheel barrows. • Store chemicals in clearly marked, sealable containers in bunded areas as approved by the ECO. Inspect the containers at regular intervals for any leaks. • Use proper dispensing equipment on containers for hazardous products and store the dispensing equipment in weatherproof containers when not in use. • Ensure that equipment and plant is in proper working condition and do not leak fuel or oil, especially during work in or near watercourses. • Ensure designated staff are trained in the prevention and mitigation of spills. • The construction camp and any major stockpiling or storage areas should be outside any watercourse unless otherwise approved by the ECO. • Stormwater runoff must be diverted around the site camp and stockpile areas (material susceptible to erosion) by means of cut-off berms or trenches to avoid contamination of clean overland runoff. • Stockpiles (topsoil, subsoil and imported materials such as sand and fill material) must be on flat surfaces in areas which are not susceptible to concentrated stormwater runoff or flow. • Ablution facilities must be located outside the boundary of any watercourse unless otherwise approved by the ECO. Workers should not be allowed to urinate or defecate near or in bushes or rivers/streams.	
Mitigation	• All spills to be contained and adequately cleaned-up or treated *in situ.* • Conduct activities with high pollution potential in the low rainfall months.	Implementing Entity

Management Measure	Detailed Description	Responsibility
	• Use designated washing areas for all equipment used for concrete work with the necessary mechanisms in place to retain contaminated runoff and allow for the necessary treatment/filtering of polluted water.	
Stop work	• Should a major spill occur (as per Section 4.7), the ECO reserves the right to suspend or partially suspend construction via instruction from the EA Holder in order to allow for the assessment, reporting and rectification of the impact. • Depending on the severity of the non-conformance and degree of negligence on the Implementing Entity's part, the ECO will also inform the relevant competent authority to confirm the Implementing Entity's liability to be prosecuted and/or fined.	ECO, EA Holder
Monitoring method and frequency	• Daily visual inspection of equipment, vehicles and machinery for signs of leaks. • Immediate response to spillage of product or material with pollution potential. • Completion of an incident form for major spillages (>5ℓ). • Reporting of major spills within 24 hrs to the ECO. • Daily and weekly monitoring/inspections by the Implementing Entity. • Formal monthly audits by the ECO.	Implementing Entity, ECO
Management outcomes	• All activities and materials with a notable pollution potential or located away from any watercourse unless otherwise approved by the ECO. • All the necessary pollution prevention measures are in place. • Plant is in good and working condition with leaks repaired immediately or the plant removed from site where more extensive repairs are required. • All hazardous products/materials are handled/managed correctly as per Section 4.7. • All hazardous liquid product spills are cleaned/treated/removed immediately as per procedure under Section 4.7.	Implementing Entity

4.9 Concrete mixing and cement handling

Identified impacts: Concrete batching/mixing operations can have several impacts, most notably soil and water pollution (increase in pH, TSS, TDS and minor levels of Aluminium, Iron and Magnesium oxides) as a result of cement laden runoff not being properly contained or purposeful discharge of cement laden runoff. Poor cement handling, storage and disposal practices can also contribute to the aforementioned impacts. Hardened concrete is however stable and inert as a waste.

Objective of improved management:

- Ensure proper cement handling, storage and disposal, avoiding discharge or disposal into the environment.
- Ensure that cement laden water/runoff from concrete/mortar mixing and application activities is collected and retained on site to allow for reuse in construction activities, avoiding discharge into the environment.

Specifications:

- A concrete batching plant/portable mixer will not be allowed to operate until a temporary washwater and runoff containment system has been constructed/established.

Table 10: Specific avoidance, mitigation and cessation management measures related to impacts identified in terms of concrete batching and cement handling

Management Measure	Detailed Description	Responsibility
Avoidance	• Where concrete is mixed in bulk (i.e. portable concrete mixer), the following will apply: o The mixer will be placed on a level, surfaced/lined area. o Bulk mixing will not occur in the wetland unless the distance from the wetland boundary to the Intervention Point necessitates *in situ* mixing. This must be approved in all instance by the PC/ECO prior to the commencement of bulk mixing concrete. • Cement storage will be in a closed container. • Waste or contaminated cement powder will be stored in a marked container with a lid until disposal or reuse. • Cement bags must be emptied properly and stored in a weatherproof container until disposal.	Implementing Entity, ECO

Management Measure	Detailed Description	Responsibility
	• Minor concrete and mortar mixing will be done on an impermeable surface such as a wooden board, wheelbarrow, metal tray etc.	
Mitigation	• Equipment and containers used for minor concrete/mortar work and mixing will be washed in a designated container and the contents disposed of in the settling system at the concrete batching plant. Washwater can alternatively be reused in concrete/mortar mixing or application, but may not be disposed of onto the ground surface or into a water resource. • Concrete (not cement) spills will be allowed to harden and removed within 2 days for reuse or disposal as a Type 4 waste to a Class D landfill.	Implementing Entity
Stop work	• Mismanagement of waste concrete and/or cement laden runoff can result in the suspension of bulk concrete mixing activities via instruction from the ECO until non-conformances have been rectified to the ECO's satisfaction.	Implementing Entity, ECO, Engineer
Monitoring method and frequency	• Daily visual inspection of areas where concrete/mortar work is taking place (Foreman). • Weekly inspection of settling system at batching plant (Foreman). • Reporting of major spills within 24 hrs to the ECO. • Formal monthly audits by the ECO.	Implementing Entity, ECO
Management outcomes	• Cement laden runoff is contained to site in an appropriately sized settling system. • Cement product is properly handled and stored and does not result in pollution of soil or water resources. • No equipment or plant used for concrete/mortar mixing or application is washed in a watercourse. • The settling system at the batching plant/portable mixer is maintained and does not overflow. • Waste concrete is removed within 2 days and reused or disposed of as inert waste.	Implementing Entity

4.10 Stormwater management, erosion and sedimentation

Identified impacts: The clearance of vegetation and earthworks associated with construction usually results in an increase in stormwater runoff volume and velocity. This in turn results in an increase in erosion and sedimentation, impacting both terrestrial and aquatic systems. Temporary structures, stockpiles and access roads can also further contribute to a concentration of runoff and resultant increase in erosion and sedimentation on site.

Objective of improved management:

- To avoid and mitigate the increase in stormwater volumes and velocity, thereby reducing erosion and sedimentation on site.

Specifications: None

Table 11: Specific avoidance, mitigation and cessation management measures related to impacts identified in terms of stormwater management, erosion and sedimentation

Management Measure	Detailed Description	Responsibility
Avoidance	• Vegetation and topsoil clearance will occur at increments and will only be done up to two weeks ahead of actual construction (i.e. excavation) commencing in an area. • Material (excavated and imported) stockpiles will not be located in areas of concentrated runoff/flow.	Implementing Entity
Mitigation	• Stormwater generated on the cleared construction footprint will be allowed to discharge into the surrounding vegetation at regular intervals and will not be allowed to collect and concentrate in large volumes or discharge at high velocities. • Disturbed areas must be rehabilitated as soon as possible after construction has been completed in order to stabilise exposed surfaces which are susceptible to erosion. • Implement temporary stormwater management and erosion prevention measures in areas with high erosion potential (in consultation with the ECO).	Implementing Entity
Stop work	N/A	

Management Measure	Detailed Description	Responsibility
Monitoring method and frequency	• *Ad hoc* visual inspections of site by the Implementing Entity after rainfall exceeding 15mm per day. • Formal monthly audits by the ECO.	Implementing Entity, ECO
Management outcomes	• Exposed ground surfaces are limited and rehabilitated immediately after completion of construction activities in an area. • Stormwater runoff is dissipated and allowed to discharge at regular intervals. • Erodible stockpiles are located outside areas of stormwater concentration. • The construction site does not contribute notably to erosion on-site and in the immediate vicinity of the site. • Erosion is detected/identified and addressed/mitigated within 14 days of occurring. • Temporary stormwater management and erosion prevention measures are implemented in areas with high erosion potential of signs of extensive erosion occurring.	Implementing Entity, ECO

4.11 Dust nuisance

Identified impacts: Construction activities will typically lead to dust generation and general exhaust emissions from vehicles and construction plant. Given the limited extent of vegetation clearance and low number of vehicles and construction plant used on a typical WfWetlands site, dust generation is expected to generally be minimal and restricted to mostly a nuisance impact.

Objective of improved management:

- To limit the generation of dust and where needed mitigate dust nuisance.

Specifications:

- Watering for dust suppression purposes is only recommended in instances where dust will create a significant health and/or safety hazard.

Table 12: Specific avoidance, mitigation and cessation management measures related to impacts identified regarding dust nuisance

Management Measure	Detailed Description	Responsibility
Avoidance	• As far as possible stockpile materials which are prone to become airborne away from areas where dust will be a nuisance or a hazard. • Limit the height of stockpiles which could cause a dust nuisance to 1m. • Where the abovementioned cannot be achieved, cover stockpiles consisting mostly of fine material with shade cloth, hessian or a similar acceptable cover. • Limit earthworks in during windy conditions (i.e. winds above 40 km/h). • Limit vehicle travelling speeds on unsurfaced roads to 40 km/h.	Implementing Entity
Mitigation	• Where dust poses a notable health and/or safety hazard, implement a watering schedule to address the particular area of concern. • Ensure that a watering schedule is maintained over weekends and holidays where a dust nuisance could pose a health and/or safety hazard to the public using the road. • Record and address any public/community complaints regarding dust generation in the Complaints Register.	Implementing Entity

Management Measure	Detailed Description	Responsibility
Stop work	• Work causing excessive dust will be halted at wind speeds exceeding 40km/h. • Where dust generation leads to/results in a complaint by the public or landowner, the ECO reserves the right to suspend or partially suspend work on site until the source of dust is identified and mitigation measures implemented.	Implementing Entity, ECO
Monitoring method and frequency	• Daily visual monitoring. • Recording of public complaints regarding dust generation in Complaints Register.	Implementing Entity
Management outcomes	• The dustfall rate as specified under regulation 3 of GN R827 (National Environmental Management: Air Quality Act (No. 39 of 2004) - National Dust Control Regulations, 2013) is not exceeded. • Stockpiles which could cause a dust nuisance are limited to 1m in height or covered with a suitable material. • No public complaints are received regarding dust nuisance and/or health and safety hazard. • Where required, a watering schedule is implemented where required i.e. where dust causes a health and/or safety hazard. • Alternative dust binding products are used where long-term watering (> 4 weeks) over an extensive area (>1ha) is required. • Vehicle travelling speed is limited to 40km/h on unsurfaced roads.	Implementing Entity, ECO

4.12 Noise nuisance

Identified impacts: Typical construction activities can lead to excessive noise which could cause a disturbance or nuisance to neighbouring land uses/receptors. Typical construction related noise which would usually be regarded as permissible in urban areas might also be regarded as a disturbance in areas such as nature reserves or on farms.

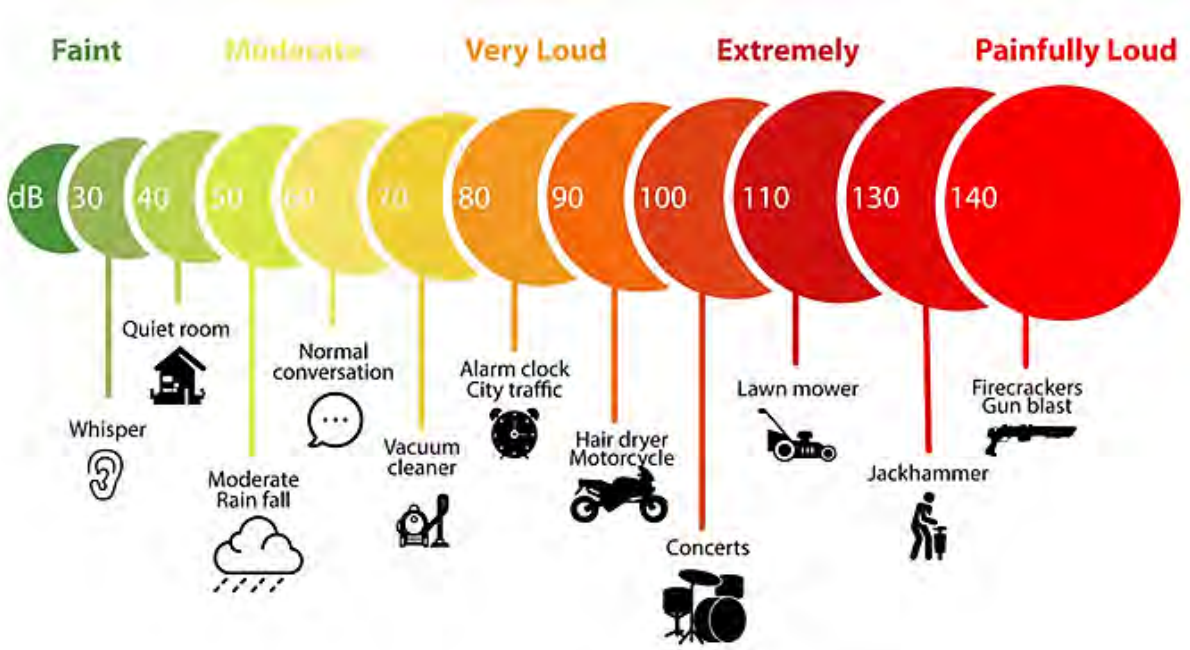


Figure 1: Example of typical everyday noises and related dB values[24]

Objective of improved management:

- Manage the level and duration of excessive noise generated as a result of construction activities and avoid resultant public complaints. Also ensure that sensitive receptors are notified in advance where excessive noise cannot be avoided for a certain period of time or activity.

Specifications: None

[24] http://ototronixdiagnostics.com/images/decibelthermometer-horizontal.jpg

Table 13: Specific avoidance, mitigation and cessation management measures related to impacts identified regarding noise nuisance

Management Measure	Detailed Description	Responsibility
Avoidance	• Fit silencers to equipment as required. • Ensure equipment and vehicles are properly maintained and in working order. • The Implementing Entity shall limit noise levels (e.g. install and maintain silencers on machinery). The provisions of SANS 1200A Sub-clause 4.1 regarding "built-up areas" shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas. • Appropriate directional and intensity settings are to be maintained on all hooters and sirens.	Implementing Entity
Mitigation	• Limit working hours with noisy equipment to weekdays between 07H00 and 18H00. • Inform sensitive receptors in advance of construction activities. • Construction activities generating output levels of 50dB (A) or more, in peri-urban areas, shall be confined to the hour's 08h00 to 17h00 Mondays to Saturdays. • Record and address any public/community complaints regarding noise generation in the Complaints Register. • Request formal approval of extension of working hours by the ECO prior to implementing extended hours or working over weekends.	Implementing Entity, ECO
Stop work	N/A	
Monitoring method and frequency	• Daily monitoring (by means of a dB meter application on a cell phone) should any laud activities take place. • Recording of public complaints regarding noise generation in Complaints Register.	Implementing Entity

Management Measure	Detailed Description	Responsibility
Management outcomes	• Compliance with the Environment Conservation Act (No. 73 of 1989): Regulations in terms of Section 25 - Noise Control (GN R154, 1992)[25]. • No public complaints are received regarding noise generation and/or health and safety hazard.	Implementing Entity, ECO

[25] Please note: These regulations have been repealed in Gauteng by Gen N 5479 / PG 75 / 19990820; in the Free State by Gen N 24 / PG 35 / 19980424 and in the Western Cape by RN 627 / PG 5309 / 19981120. Proposed Noise Control Regulations have been published for Eastern Cape under Gen N 181 / PG 824 / 20011210. Please also note that various municipalities have their own By-Laws regarding noise control.

4.13 Ablution

Identified impacts: A lack of proper and well placed ablution facilities can result in poor working conditions, health risks as well as environmental pollution.

Objective of improved management:

- To provide sanitary working conditions and avoid heath risks and environmental pollution as a result of a lack of ablution facilities.

Specifications: None

Table 14: Specific avoidance, mitigation and cessation management measures related to impacts identified in terms of ablution

Management Measure	Detailed Description	Responsibility
Avoidance	• Prior to construction commencing the Implementing Entity must provide sanitation for Contractors at a ratio of one (1) toilet for every 15 workers. • Toilets should preferably be located outside the wetland boundary and must be approved by the ECO. • Toilets shall be placed on level surfaces and secured to the ground outside areas susceptible to potential flooding. • The Implementing Entity shall supply toilet paper at all toilets at all times. The Implementing Entity shall ensure that the workers make use of the toilets provided. • The Implementing Entity shall be responsible for the cleaning, maintenance and servicing of the toilets. • The Implementing Entity shall ensure that the toilets are protected from vandals. No litter or general waste shall be placed in the toilets. • Upon completion of the contract, the pit latrines shall be filled in and all structures shall be removed from site. • Washing areas with soap and sufficient clean water shall be provided for hand washing after use of ablutions.	Implementing Entity
Mitigation	N/A	
Stop work	N/A	

Management Measure	Detailed Description	Responsibility
Monitoring method and frequency	• Daily inspection (by the Implementing Entity) to allow for timely removal/servicing of the ablution facilities. • Monthly compliance audits (including checking of disposal slips where relevant) by the ECO.	Implementing Entity, ECO
Management outcomes	• A sufficient number of ablution facilities is provided at locations approved by the ECO. • Toilets are placed on level areas and secured to the ground. • Toilets are provided at a ratio of one (1) toilet for every 15 workers.	Implementing Entity

4.14 Waste management

Identified impacts: The construction phase will produce typical construction waste such as general waste, waste containers, cement bags, off-cuts etc. The volumes of waste to be generated on a typical WfWetlands site are expected to be low.

Objective of improved management:

- To prevent general littering and to ensure that waste is correctly stored on-site and disposed of off-site. Licenced waste disposal facilities (landfill, transfer, recycling) can be found using the search function at the following link http://sawic.environment.gov.za/?menu=88.

Specifications: None

Table 15: Specific avoidance, mitigation and cessation management measures related to impacts identified in terms of waste management

Management Measure	Detailed Description	Responsibility
Avoidance	• Waste will not be buried or burned on site. • The quantity of materials and product brought to site will not be in notable excess of what is required for construction. • Waste from other construction sites where the Implementing Entity is working will not be brought onto site or stored on site. • Waste storage facilities will outside the wetland boundary or other sensitive areas. • Waste storage facilities and containers will be weather and scavenger proof with sufficient capacity to avoid waste accumulating outside of the facility or containers. • The Implementing Entity shall ensure that general and inert waste does not become contaminated by hazardous waste thereby generating larger volumes of hazardous waste requiring disposal at a Class A landfill.	Implementing Entity
Mitigation	• The Implementing Entity shall, in conjunction with the ECO, designate restricted areas for eating. The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited.	Implementing Entity

Management Measure	Detailed Description	Responsibility
	• Waste generated on site will be collected and transported to the waste storage area at the site camp on a daily basis. • Each foreman will do a daily inspection/walkthrough of his area and ensure that it is litter free. • Waste storage areas will be restricted to the site camp. • Hazardous and general waste will be separated and designated and marked bins/containers provided for each. • In the case of skippy bins being used, the bins will be covered with secured shade cloth or other cover approved by the ECO. Skippy bins are only allowed for storage of inert waste such as wood off-cuts, hardened concrete etc. • Waste transport will be by means of an appropriate vehicle with containers and/or bags secured and covered to prevent waste being blown from the vehicle during transport. • Used oil will be collected and taken to or collected by a registered oil recycling company. • Other hazardous waste as per Schedule 3 of NEM:WA and Annexure 1 of GN R634 (2013) will be disposed of at a Class A landfill or collected by an approved service provider. Proof of safe transfer/disposal will be filed in the SEF. • Waste disposal restrictions as per GN R636 (2013) shall apply. Of specific relevance is: o Lead acid batteries, corrosive or oxidizing products. o Waste which is flammable with a flash point lower than 61°C. o Waste compressed gases. o Re-usable, recoverable or recyclable used lubricating mineral oils, as well as oil filters, but excluding other oil containing wastes. o Re-usable, recoverable or recyclable used or spent solvents.	

Management Measure	Detailed Description	Responsibility
	o Lamps. o Tyres (whole or quartered). o Liquid waste or waste with a moisture content of >40%.	
Stop work	N/A	
Monitoring method and frequency	• Daily inspection of working area for any litter/waste. • Weekly checking of waste storage area to ensure timeous removal of waste off-site prior to storage areas becoming overfull. • Proof of safe disposal filed in Environmental File and audited monthly by ECO.	Implementing Entity, ECO
Management outcomes	• No waste disposed of or burned on site. • No visible littering. • Waste transport does not result in waste being blown from the vehicle along the route. • Appropriate and separate storage of different types of waste in approved locations. • Proper record keeping of hazardous waste generated and safe and legal disposal thereof.	Implementing Entity

4.15 Removal of alien invasive species

Identified impacts: The WfWetlands programme often involves the removal of alien invasive species as part of an intervention(s) to improve wetland functioning. The method for removal is usually specified in the aforementioned situation. A construction site, due to its inherent disruptive nature, does however also lead to conditions ideal for the establishment of weeds/pioneer species and alien invasive species (hereafter collectively referred to as "weeds") which could compromise the habitat integrity and ecological functioning of the wetland system as well as downstream systems. It is therefore important to implement strict control measures to ensure that alien invasive species are not introduced into a system or/and are not allowed to dominate an area post-construction.

Objective of improved management:

- No new alien invasive/pioneer species are introduced into the wetland system and catchment.
- Emerging weeds are removed prior to seed formation stage.

Specifications:

- Where project activities include the eradication of invasive alien plants, Working for Water guidelines and policies shall be adhered to.
- Weeds will be removed prior to reaching seed formation stage.
- Prior to construction, the Implementing Entity shall ensure that invasive alien vegetation is cleared from the entire site in accordance to the applicable Working for Water guidelines and policies. Follow up clearing may be necessary if the species re-establish following the initial clearing.
- Species that are declared invasive species (according to NEMBA's Alien and Invasive Species Regulations, 2014 (GN R598)) must be recorded and polygons of the affected area must be submitted to the Working for Water national alien invasive plant database.
- The Alien and Invasive Species Lists 2016 (GN 864) will apply when identifying species which require removal/eradication.
- No trees within the environmentally sensitive areas may be removed, whether alien species or not, unless permitted by the ECO.
- Other alien species (non-listed) occurring on site may not be used in the landscaping and should be removed from site where possible.
- Where an individual or group of an invasive alien specimens/plants has potential cultural or heritage value e.g. a blue gum lane, tree at a grave site, the landowner and/or community will be consulted prior to the removal of the specimen(s). The aforementioned might also be protected under the NHRA, in which case removal might not be allowed.

Table 16: Specific avoidance, mitigation and cessation management measures related to the removal of Alien Invasive/pioneer species

Management Measure	Detailed Description	Responsibility
Avoidance	• Imported material shall be free of weeds. • Stockpiles (topsoil and subsoil) will be checked for emerging weeds on a fortnightly basis. • Topsoil sourced from areas with notable weeds infestation will not be used in other areas for rehabilitation or fill purposes.	Implementing Entity
Mitigation	• Where sand/fill material is legally sourced from a dam, existing borrow pit or similar with clear presence of invasive alien species, the Implementing Entity will allow for a weeding programme at the on-site stockpile area and Intervention Point.	Implementing Entity
Stop work	N/A	
Monitoring method and frequency	• Fortnightly inspections of disturbed/cleared areas and stockpiles for signs of emerging weeds. • Monthly audit/visual inspection by ECO.	ECO
Management outcomes	• Construction activities are restricted to the approved construction footprint. • The Implementing Entity's activities does not lead to the negligent or wilful damage to a natural feature.	Implementing Entity

4.16 Impact on fauna

Identified impacts: Typical construction activities could lead to fatalities of small fauna e.g. birds, reptiles, rodents through direct impact and the destruction of habitat. The proposed project will however be limited to the road reserve which is already completely transformed and subject to daily traffic. The upgrade/replacement of culverts and bridges might result in the destruction of a number bird nests attached to the structures.

Objective of improved management:

- Protect fauna in the study area, preserve the ecological functioning along the development footprint as much as is possible.

Specifications: None

Table 17: Specific avoidance, mitigation and cessation management measures related to impacts on fauna

Management Measure	Detailed Description	Responsibility
Avoidance	• Do a site walkthrough prior to construction commencing to remove any slow moving animals and to identify nesting sites, burrows etc. • Demarcate nesting sites which should be avoided as no-go areas by means of painted pegs. • Avoid disturbance of burrows, nests etc. where possible. • Create awareness of conservation of fauna during environmental induction and toolbox talks. • Fauna may not be captured, poisoned, trapped or killed. • Do not feed wildlife. • Where working in a nature reserve with potentially dangerous animals present, ensure that the team is accompanied by a suitably qualified game ranger at all times. • A speed limit of 20 km/h in nature reserves will apply unless otherwise indicated by the reserve road signage. • Inspect excavations for trapped animals prior to work commencing each day. • Do not use pesticides on site.	Implementing Entity

Management Measure	Detailed Description	Responsibility
	• Do not burn vegetation. • Store waste in weather and scavenger proof bins to avoid ingestion of waste by wildlife.	
Mitigation	• Limit the construction footprint. • Reinstate temporary footprints after construction has been completed. • Report any animal fatalities of significance to the ECO and relevant reserve management (where applicable) and identify measures to avoid reoccurrence.	Implementing Entity, ECO
Stop work	N/A	
Monitoring method and frequency	• Daily inspections of trenches and excavations prior to construction commencing. • Weekly inspections of demarcated no-go areas. • Recording of incidents and near misses (e.g. vehicle-antelope collision) in the site diary and at site meetings. • Disciplinary action against any construction staff guilty of purposefully capturing, poisoning, trapping or killing wildlife.	Implementing Entity
Management outcomes	• No unnecessary fauna fatalities. • Limited habitat disturbance and reinstatement of temporary construction footprints.	Implementing Entity

4.17 Protection of natural features

Identified impacts: Construction activities could result in damage to natural features such as rock outcrops and exposed rock faces/cliffs. The project is not located in an area associated with rock paintings, caves, waterfalls, trees of historical or cultural significance etc. and the risk of damage to natural features is generally considered low.

Objective of improved management:

- No damage to natural features due to negligent or purposeful action during construction.

Specifications:

- Demarcation will be by means of brightly painted/white pegs/poles at least 1.5m in height and placed at regular (10m for linear of on every corner for non-linear) intervals on both sides of the approved construction footprint.
- Danger tape and/or snow/barrier netting shall only be used for health and safety requirements along excavations or high risk areas.
- All temporary barriers and signage must be removed and the site restored on completion of the project.

Table 18: Specific avoidance, mitigation and cessation management measures related to impacts on natural features

Management Measure	Detailed Description	Responsibility
Avoidance	• Construction activities shall be restricted to the approved construction footprint. • Sensitive or no-go areas in close proximity (<100m) to the construction site will be demarcated with painted pegs and marked as no-go areas. • The Implementing Entity shall not deface, paint, damage or mark any natural features (e.g. trees or rock formations) situated in or around the site for survey or other purposes unless agreed beforehand with the ECO and Engineer.	Implementing Entity
Mitigation	• Any features affected by the Implementing Entity as a result of negligence or wilful conduct shall be restored/ rehabilitated to the satisfaction of the ECO and/or relevant competent authority.	Implementing Entity
Stop work	N/A	

Management Measure	Detailed Description	Responsibility
Monitoring method and frequency	• Monthly audit/visual inspection by ECO.	ECO
Management outcomes	• Construction activities are restricted to the approved construction footprint. • The Implementing Entity's activities does not lead to the negligent or wilful damage to a natural feature.	Implementing Entity

4.18 Protection of heritage resources (including palaeontological objects)

Identified impacts: The nature and location of typical WfWetlands interventions seldom have the potential to cause the destruction or lead to the discovery of palaeontological objects such as fossils. An exception is peat wetlands which can contain fossils at usually substantial depth. Heritage resources are identified during the EIA phase and indicated as no-go areas. There is however still the opportunity for the discovery or damage to new objects during the construction phase.

Objective of improved management:

- To avoid damage to known heritage objects and to ensure a protocol is in place in the case of discovery of an unknown heritage or palaeontological object.

Specifications: None

Table 19: Specific avoidance, mitigation and cessation management measures related to impacts on heritage resources (including palaeontological objects)

Management Measure	Detailed Description	Responsibility
Avoidance	• The Implementing Entity shall avoid all “no-go” areas as identified during the EIA. • General staff awareness training in terms of the protection and conservation of heritage resources during the environmental induction and toolbox talks.	Implementing Entity
Mitigation	• Should any cultural, archaeological or palaeontological artefacts/objects or evidence be discovered at any stage during construction, the Implementing Entity will cease work in the vicinity of the artefact/object and inform the ECO who will in turn inform the relevant specialists and authorities. • Site staff is not allowed to collect or keep on artefact or object of cultural, archaeological or palaeontological significance.	Implementing Entity, ECO, Specialist
Stop work	• Should any cultural, archaeological or palaeontological artefacts/objects or evidence be discovered, partial suspension of construction activities in the immediate vicinity of the object might need to be required until the object can be evaluated and/or removed.	Implementing Entity, ECO, Specialist

Management Measure	Detailed Description	Responsibility
Monitoring method and frequency	• Continuous during construction. • Monthly audit by ECO in terms of no-go areas being maintained.	Implementing Entity
Management outcomes	• No-go areas (i.e. all areas outside the approved construction footprint) are treated as no-go areas with no disturbance of heritage/cultural objects on private land adjacent to the construction site. • Proper procedure followed should any object or artefact be discovered during construction.	Implementing Entity

4.19 Visual impact

Identified impacts: The nature of a typical WfWetlands project is seldom such that it causes significant visual disturbance, with the visual impact of the operational outcome usually being positive. Construction activities can however lead to temporary and permanent landscape scarring and impacts, which can be excessive if not controlled and mitigated properly.

Objective of improved management: Ensure that visual impacts caused by landscape scarring are minimised through proper planning and mitigated through successful rehabilitation.

Specifications: None

Table 20: Specific avoidance, mitigation and cessation management measures related to visual impacts

Management Measure	Detailed Description	Responsibility
Avoidance	• Avoid excessive vegetation clearance. • Ensure construction remains within the approved construction footprint. • Do not paint or deface any natural feature.	EAP, ECO, Implementing Entity
Mitigation	• Ensure that materials used for construction limits visual impacts e.g. use natural colours where possible. • Ensure that the site remains neat and tidy with no littering etc. • Use shade cloth or construction cordon in areas specifically sensitive to visual disturbances e.g. areas frequented by tourists or the public. • Record and address community complaints as per procedure specified under Section 4.3. • Ensure rehabilitation is successful as specified under Section **5**.	Implementing Entity
Stop work	N/A	
Monitoring method and frequency	As specified for rehabilitation under Section **5**.	ECO

Management Measure	Detailed Description	Responsibility
Management outcomes	• Visual impacts are minimised and managed. • The extent of disturbance is minimised and limited to the approved construction footprint. • The extent of intervention infrastructure remaining bare i.e. no vegetated is limited as best as possible. • Rehabilitation meets the requirements and targets as per Section **5**.	Implementing Entity, ECO

5 REHABILITATION PHASE

Identified impacts: Poor rehabilitation can often lead to secondary impacts such as erosion, an increase in alien invasive species, decreased biodiversity, decreased habitat connectivity, poor ecological integrity and functioning and so forth. Given the core focus of the WfWetlands programme, successful rehabilitation is also a key factor, but should entail more than the functioning of an intervention with focus on ensuring that the permanent footprint of the construction site and actual structure is minimal.

Objective of improved management:

- To ensure that construction footprints are rehabilitated and that site rehabilitation is undertaken in such a manner that the permanent footprint of the construction site of the Intervention Point is minimal.

Specifications:

- All working areas shall be rehabilitated once work has been completed and before the team leaves the site. This includes closure and rehabilitation of temporary access routes.
- All foreign material not utilised in the rehabilitation activities shall be removed from the site.
- Re-vegetation of all exposed soils, and measures to address any potential erosion risk shall be done before the team leaves the site.
- Where project activities include the eradication of invasive alien plants, Working for Water guidelines and policies shall be adhered to.
- All rehabilitated areas shall be considered “no-go” areas upon completion and the Implementing Entity shall ensure that none of his staff or equipment enters these areas.
- Specific Site Rehabilitation measures have been included in the project specific Rehabilitation Plans and shall be referred to for site closure. Due notice of the conditions of Environmental Authorisation and requirements of the General Authorisation for water uses (Annexure B) must be complied with.
- Specifically, on the completion of the construction activities:
    - All disturbed areas must be re-vegetated with local indigenous vegetation suitable to the area.
    - An active campaign for controlling new exotic and alien vegetation must be implemented within the disturbed areas.
    - Structures must be inspected after a major rain event (i.e. more than 50mm rainfall) or annually for the accumulation of debris, blockages, instabilities and erosion with concomitant remedial and maintenance actions.

Table 21: Specific avoidance, mitigation measures related to rehabilitation of the project footprint

Management Measure	Detailed Description	Responsibility
Avoidance	• Manage site demarcation and vegetation clearance as per Sections 4.2, 4.4 and 4.5 respectively. • Ensure that sufficient topsoil is available through proper removal, stockpiling and maintenance procedures as specified under Section 4.5.	Implementing Entity
Mitigation	**General:** • All waste will be collected and removed (also look beyond immediate working area for any waste which might have been blown into the surrounding area). • All spoil and excess material must be removed material. • All spills and waste concrete must be removed. • All temporary markings and site demarcation must be removed. • All temporary construction signage must be removed. • Where temporary access roads cut across contours, diversion berms will be constructed at 30m intervals to avoid erosion and concentration of runoff prior to vegetation establishing. Mulching shall be applied to the decommissioned temporary access road. **Shaping and revegetation:** • Material will be backfilled in the order on which it was removed. • Compacted soil shall be scarified prior to topsoil and seed application. • Topsoil shall be applied at a minimum depth of 75mm. • Where the Implementing Entity failed to manage topsoil properly, the Implementing Entity shall be held responsible to source topsoil of similar quality from a commercial source OR to remediate compromised topsoil by means of compost, fertiliser and seeding as agreed by the ECO.	Implementing Entity, ECO, Engineer

Management Measure	Detailed Description	Responsibility
	• Topsoil shall match the type and quality of topsoil removed from that area. • Special care shall be taken where rehabilitation occurs across several wetland zones and or crossing between wetland and dryland habitats to match the soil removed to the area where it is reapplied. • Seeding/re-seeding should, where possible, be timed to take advantage of the rainy season. • All reinstated slopes will be at a gradient of 1:3 to 1:4. • Slopes of 1:2 and 1:1 shall be stabilised by means of suitable geotextiles, hard structures or any other means as approved by the ECO. • Slopes of 1:2 and 1:1 will be revegetated by means of sods and/or plugs of an approved indigenous grass specie. No Kikuyu shall be used for revegetation purposes. • Local indigenous plants shall be used in the landscaping of the site. Plants that are proclaimed as problem plants or noxious weeds (see Section 4.15) are to be excluded from the landscaping plan and must be removed immediately, should they occur on site. • Plants introduced into the project sites must be guided by ecological rather than horticultural principles. For example ecological communities of indigenous plants provide more biodiversity and habitat opportunities and would blend with natural vegetation. • Where sods are sources from the surrounding environment, the sods must be 30x30cm, sourced in a checkered pattern in a flat area (i.e. not on slopes). The sods must be sourced 1m in radius apart and will be planted within 24 hours of removal unless otherwise approved by the ECO. • Should the reshaping of watercourse banks be required it will match the natural preconstruction geomorphology and slope structure. Extensive reshaping of watercourse banks (and beds if applicable) will be done under close supervision of the ECO or relevant specialist.	

Management Measure	Detailed Description	Responsibility
	• Areas where sods, plugs or seeds have been used as part of slope stabilisation measures will be watered at least every third day for a minimum period of 6 weeks unless the area is in a permanently wet zone of a wetland i.e. no watering required. **Rehabilitation of peatlands**: • Upon rehabilitation, the removed sods and soil stockpiles shall be placed back into the system in the original order/layers (i.e. deeper layers shall be placed first with the rhizosphere layer at ground level), and orientation (according to the natural slope). Should the moisture content of the sods be less than 90% moisture, the Implementing Entity shall be required to peg them with wooden stakes. • The site shall be mulched (alternatively cloth/geotextile may be used) and livestock shall be fenced out for at least two seasons. Alternatively brush packs can be used to keep livestock and/or game away from the site. • If compaction took place, the Implementing Entity shall loosen the soil with a fork on flat surfaces, and create small contour berms on paths with slopes.	
Stop work	N/A	
Monitoring method and frequency	• The Implementing Entity shall notify the ECO once rehabilitation in an area has been completed. The ECO shall be responsible for the technical, not contractual, sign-off of the rehabilitated sections. Only once the rehabilitation has been approved by the ECO, may the contractual sign-off be effected. • The ECO shall conduct monthly inspections of rehabilitated areas for the first three months and then continue with inspections on a quarterly basis until the end of the contract period. • The ECO should audit the site at the end of the Implementing Entity's retention period to establish whether rehabilitation has been successfully carried out. If not, the retention money could be used to implement additional rehabilitation measures.	Implementing Entity, ECO, Engineer
Management outcomes	• Vegetation clearance is limited to the approved construction footprint. • All sloped areas are stable with no sign of slope failure or erosion.	Implementing Entity, ECO, Engineer

6 EMERGENCY REPORTING AND PROCEDURES

The Implementing Entity must ensure that all emergency procedures are in place prior to commencing work. The nearest emergency service provider shall be identified and the up-to-date contact details of this emergency centre, as well as the police and ambulance services shall be displayed on a notice board and shall be made available to staff on-site. Emergency equipment including fire-fighting equipment shall be positioned at accessible locations near to areas where such emergencies may arise.

6.1 Emergency Awareness

The Implementing Entity shall ensure that site staff are aware of the procedure to be followed for dealing with emergencies, which shall include notifying the Implementer and relevant authorities of the event. All site staff shall be briefed regarding the requirements for dealing with potential emergencies including fires, accidental leaks and spillage of pollutants (also see Section 4.7 and 4.8), as well as Health and Safety incidents. Education of site staff shall focus on both preventative and remedial actions in the case of an emergency.

6.2 Incident Recording

The Implementing Entity shall complete an Incident Report (refer to template under Annexure B) in the case of any environmental emergencies, accidents or incidents (including near misses). The ECO shall monitor that the necessary procedures and responses are followed to close out any entries in the Environmental Incident Report. The aforementioned report will be filed in the SEF.

6.3 Fire

The Implementing Entity must take all reasonable measures to ensure that fires are not started as a result of construction activities on site, and shall also ensure that their operations comply with the Occupational Health and Safety Act (Act No. 85 of 1993). Where possible, all work done in the dry season shall be organised in liaison with the landowners so that it fits into their firebreak/ fire protection programme. No large open fires are permitted on site. Smoking on site shall only be permitted in designated areas and in the presence of a fire extinguisher.

Basic functional fire-fighting equipment (one back pack and at least five beaters) shall be made available at each work site at all times. In forestry areas there must also be two rake hoes per team. The Implementing Entity shall appoint a member of his staff to be responsible for the installation and inspection of this equipment. Where work will take place in a peatland or wetland with a high organic soil content, a Method Statement shall be prepared for the ECO's approval, detailing all the actions that will take place should a fire occur, as well as the relevant emergency contacts.

Where fuels and machines are used on site, the prescribed fire extinguishers in working condition must be made available by the Implementing Entity.

Sparks generated during welding, cutting of metal or gas cutting can result in fires. Every possible precaution shall therefore be taken when working with this equipment near potential sources of combustion. Such precautions include having an approved fire extinguisher immediately available at the site of any such activities.

The Implementing Entity is to ensure that he/ she has the contact details of the nearest fire station in case of an emergency.

This page is left blank intentionally

Annexure A: Basic Code of Conduct / Implementation

- Private property access is only permitted on previous agreement with the affected landowner, or will be considered trespassing. Trespassing on adjacent properties shall be subject to disciplinary and legal action.
- Ensure that closed gates are kept closed. When in doubt, the landowner should be consulted.
- Teams working outside of the active site, or requiring access to private properties are to carry identification on their persons that includes their name, position, company of employ, and reference to the Working for Wetlands Project. Similarly, such information shall be displayed on vehicle dashboards/exteriors.
- All work shall be based on an approved rehabilitation plan.
- Any deviations from the planned specification need to be approved by the PC and the relevant Engineer.
- A construction supervisor shall be appointed. The appointment letter shall be made available on site.
- Work sites shall be properly planned and marked out, preferably in collaboration with the Implementing Entity. Areas shall be demarcated for vehicle access and parking, off-loading, mixing etc. (refer to Section 4.2).
- No unauthorised person may enter the work site.
- The location and position of all rehabilitation interventions shall be precisely demarcated by the Engineer and the Implementer, according to the rehabilitation plan.
- Dimensions of rehabilitation interventions shall also be marked out where appropriate (e.g. depth of an excavation).
- Implementation of all interventions will be done with a focus on cost-effectiveness and efficiency, while maintaining quality and appropriateness.

This page is left blank intentionally

Annexure B: Site Environmental File & Templates

Section	Template available
1. Rehabilitation Plan and EMP	
2. Implementing Entity **Agreements**	
2.1. Undertaking in terms of Environmental Authorisation, Environmental Management Programme, Rehabilitation Plan and submitted Method Statements	**Yes**
3. Approvals and Licenses	
3.1. Environmental Authorisation	
3.2. Section 21(c) and (i) General Authorisation	
3.3. Waste license (if applicable)	
4. Communication	
4.1. Important correspondence e.g. notice to Competent Authority of commencement of construction	
4.2. Copy of public complaints register	**Yes**
5. Site Management	
5.1. Approved layout	
5.2. Site instructions (or copies thereof)	
6. Environmental Training	
6.1. Proof of toolbox talks, environmental awareness and induction (incl. attendance register and training material)	
7. Method Statements	
7.1. Combined method statements	**Yes**
7.2. Additional method statements	**Yes**
8. Records	
8.1. Record of waste generation – quantity, type, fate (incl. general/hazardous, liquid/solid)	
8.2. Proof of legal/safe waste disposal	
8.3. Record of chemicals on site and Material Safety Data Sheets (MSDS)	
8.4. Record of water usage (if applicable)	
8.5. Request for deviations	**Yes**
9. Audits	
9.1. Baseline Audit	**Yes**
9.2. ECO audit reports	
9.3. Internal audits/check conducted by the Implementing Entity	**Yes**
9.4. Incident and non-conformance reports	**Yes**
9.5. Site closure	**Yes**

This page is left blank intentionally

Section	Template available
1. Rehabilitation Plan and EMP	
2. Implementing Entity Agreements	
2.1. Undertaking in terms of Environmental Authorisation, Environmental Management Programme, Rehabilitation Plan and submitted Method Statements	**Yes**
3. Approvals and Licenses	
3.1. Environmental Authorisation	
3.2. Section 21(c) and (i) General Authorisation	
3.3. Waste license (if applicable)	
4. Communication	
4.1. Important correspondence e.g. notice to Competent Authority of commencement of construction	
4.2. Copy of public complaints register	Yes
5. Site Management	
5.1. Approved layout	
5.2. Site instructions (or copies thereof)	
6. Environmental Training	
6.1. Proof of toolbox talks, environmental awareness and induction (incl. attendance register and training material)	
7. Method Statements	
7.1. Combined method statements	Yes
7.2. Additional method statements	Yes
8. Records	
8.1. Record of waste generation – quantity, type, fate (incl. general/hazardous, liquid/solid)	
8.2. Proof of legal/safe waste disposal	
8.3. Record of chemicals on site and Material Safety Data Sheets (MSDS)	
8.4. Record of water usage (if applicable)	
8.5. Request for deviations	Yes
9. Audits	
9.1. Baseline Audit	Yes
9.2. ECO audit reports	
9.3. Internal audits/check conducted by the Implementing Entity	Yes
9.4. Incident and non-conformance reports	Yes
9.5. Site closure	Yes

2 Implementing Entity Agreements

2.1 Undertaking in terms of Environmental Authorisation, Environmental Management Programme, Rehabilitation Plan and submitted Method Statements

PROJECT NAME:	……
IMPLEMENTING ENTITY:	……
DATE:	……

I, _____ (name), ID number _____ hereby confirm the following:

1. I have received a copy of the Environmental Authorisation (EA), Environmental Management Programme (EMPr) and Rehabilitation Plan for this project.
2. I have familiarised myself with the contents of aforementioned documents and understand what is required from me as the Implementing Entity.
3. I understand that I will be audited against the EA, EMPr, Rehabilitation Plan and approved Method Statements.
4. I understand that the EA is legally binding and that a contravention of an EA condition can lead to the suspension of the EA and thus construction.
5. I understand that I am responsible for the actions of my employees and will ensure that all staff on site are aware of the requirements and restrictions as per the EA, EMPr, Rehabilitation Plan and Method Statements.

_____	_____	_____
Signed	Designation	Dated

Section	Template available
1. Rehabilitation Plan and EMP	
2. Implementing Entity Agreements	
2.1. Undertaking in terms of Environmental Authorisation, Environmental Management Programme, Rehabilitation Plan and submitted Method Statements	Yes
3. Approvals and Licenses	
3.1. Environmental Authorisation	
3.2. Section 21(c) and (i) General Authorisation	
3.3. Waste license (if applicable)	
4. Communication	
4.1. Important correspondence e.g. notice to Competent Authority of commencement of construction	
4.2. Copy of public complaints register	**Yes**
5. Site Management	
5.1. Approved layout	
5.2. Site instructions (or copies thereof)	
6. Environmental Training	
6.1. Proof of toolbox talks, environmental awareness and induction (incl. attendance register and training material)	
7. Method Statements	
7.1. Combined method statements	Yes
7.2. Additional method statements	Yes
8. Records	
8.1. Record of waste generation – quantity, type, fate (incl. general/hazardous, liquid/solid)	
8.2. Proof of legal/safe waste disposal	
8.3. Record of chemicals on site and Material Safety Data Sheets (MSDS)	
8.4. Record of water usage (if applicable)	
8.5. Request for deviations	Yes
9. Audits	
9.1. Baseline Audit	Yes
9.2. ECO audit reports	
9.3. Internal audits/check conducted by the Implementing Entity	Yes
9.4. Incident and non-conformance reports	Yes
9.5. Site closure	Yes

4 Communication

4.2 Copy of public complaints register

COMPLAINTS REGISTER

PROJECT NAME:	……
IMPLEMENTING ENTITY:	……
DATE:	……
REVISION:	……

Id.	Date	Time	Complainant Name	Address	Contact Details	Path for complaint (Phone, Discussion, email)	Description of complaint	Detail of investigation	Result of investigation	Corrective action	Response to complaint
1											
2											
3											
4											
5											
6											
7											
8											

Section	Template available
1. Rehabilitation Plan and EMP	
2. Implementing Entity Agreements	
2.1. Undertaking in terms of Environmental Authorisation, Environmental Management Programme, Rehabilitation Plan and submitted Method Statements	Yes
3. Approvals and Licenses	
3.1. Environmental Authorisation	
3.2. Section 21(c) and (i) General Authorisation	
3.3. Waste license (if applicable)	
4. Communication	
4.1. Important correspondence e.g. notice to Competent Authority of commencement of construction	
4.2. Copy of public complaints register	Yes
5. Site Management	
5.1. Approved layout	
5.2. Site instructions (or copies thereof)	
6. Environmental Training	
6.1. Proof of toolbox talks, environmental awareness and induction (incl. attendance register and training material)	
7. Method Statements	
7.1. Combined method statements	**Yes**
7.2. Additional method statements	Yes
8. Records	
8.1. Record of waste generation – quantity, type, fate (incl. general/hazardous, liquid/solid)	
8.2. Proof of legal/safe waste disposal	
8.3. Record of chemicals on site and Material Safety Data Sheets (MSDS)	
8.4. Record of water usage (if applicable)	
8.5. Request for deviations	Yes
9. Audits	
9.1. Baseline Audit	Yes
9.2. ECO audit reports	
9.3. Internal audits/check conducted by the Implementing Entity	Yes
9.4. Incident and non-conformance reports	Yes
9.5. Site closure	Yes

7 Method Statements

The Implementing Entity is to complete this section, taking cognisance of the relevant EA, EMP, environmental specifications and SANS.

7.1 Combined method statements

PROJECT NAME:	……
IMPLEMENTING ENTITY:	……
DATE:	……
REVISION:	……

ACRONYMS

ECO	Environmental Control Officer
EMPr	Environmental Management Programme
NEMA	National Environmental Management Act (Act 107 of 1998)
SHE	Safety Health Environment

DEFINITIONS

Alien species[1]:

(a) a species that is not an indigenous species; or

(b) an indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention.

Approved: Means approved in terms of the applicable legal requirements (e.g. NEMA approval/ Environmental Authorisation) and/or has been approved by the WfWetlands Programme's Deputy Director: Planning, Monitoring and Evaluation and/or an authorised representative of the WfWetlands Programme.

Archaeological[2]:

(a) material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;

(b) rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;

(c) wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the

[1] National Environmental Management: Biodiversity Act (No. 10 of 2004)
[2] National Heritage Resources Act (No. 25 of 1999)

Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which the South African Heritage Resource Agency (SAHRA) considers to be worthy of conservation; and

Auditing[3]**:** A systematic, documented, periodic and objective evaluation which provides verifiable findings, in a structured and systematic manner, on:

(a) the level of performance against and compliance of an organisation or project with the provisions of the requisite environmental authorisation or Environmental Management Programme (EMPr) and, where applicable, the closure plan; and

(b) the ability of the measures contained in the EMPr, and where applicable the closure plan, to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity.

Authority*:* National, regional or local authority, that has a decision-making role or interest in the project.

Best Management Practice (BMP): Procedures and guidelines to ensure the effective and appropriate implementation of wetland rehabilitation by WfWetlands implementers.

Cement laden water: Means water (fresh or wash water) which has been in contact with partially cured concrete/mortar or raw cement product and which contains suspended and dissolved cement solids.

Commence: The start of any physical activity, including site preparation and any other activity on site furtherance of a listed activity or specified activity, but does not include any activity required for the purposes of an investigation or feasibility study as long as such investigation or feasibility study does not constitute a listed activity or specified activity.

Contaminated water: Means water contaminated by the Implementing Entity's activities such as with hazardous substances, hydrocarbons, paints, solvents and runoff from plant, workshop or personnel wash areas but excludes water containing cement/ concrete or silt.

Corrective (or remedial) action*:* Reactive response required to address an environmental problem that is in conflict with the requirements of the EMPr. The need for corrective action may be determined through monitoring, audits or management review.

Dam[4]**:** Any barrier dam and any other form of impoundment used for the storage of water, excluding reservoirs.

Dangerous goods: Goods containing any of the substances as contemplated in South African National Standard No. 10234, supplement 2008 1.00: designated "*List of classification and labelling of chemicals in accordance with the Globally Harmonized Systems (GHS)"* published by Standards South Africa, and where the presence of such goods, regardless of quantity, in a blend or mixture, causes such blend or mixture to have one or more of the characteristics listed in the Hazard Statements in section 4.2.3, namely physical hazards, health hazards or environmental hazards.

Decommissioning[5]**:** To take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned.

[3] Regulation 34 of GN R982 (2014, as amended) of NEMA
[4] GN R983 (2014, as amended) of NEMA
[5] GN R983 (2014, as amended) of NEMA

Dust[6]: Any material composed of particles small enough to pass through a 1 mm screen and large enough to settle by virtue of their weight into the sampling container from the ambient air.

Eco-log: A cylindrical sleeve made from, for example wire mesh, filled with organic material and/or soil used to prevent and/or repair minor erosion.

Endangered species: Means any indigenous species listed as an endangered species in terms of section 56 of the National Environmental Management Biodiversity Act ((No. 10 of 2004).

Endemic: An "endemic" is a species that grows in a particular area (i.e. it is endemic to that region) and has a restricted distribution. It is only found in a particular place. Whether something is endemic or not depends on the geographical boundaries of the area in question and the area can be defined at different scales.

Environment[7]: Means the surroundings within which humans exist and that are made up of:

i. the land, water and atmosphere of the earth;

ii. micro-organisms, plant and animal life;

iii. any part or combination of i) and ii) and the interrelationships among and between them; and

iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental impact: An environmental change caused by some human act.

Environmental impact: Change in an environment resulting from the effect of an activity on the environment, whether positive or negative. Impacts may be the direct consequence of an individual's or organisation's activities or may be indirectly caused by them (DEAT, 1998).

Erosion: The loss of soil through the action of water, wind, ice or other agents, including the subsidence of soil.

Gabion: A structure made of wire mesh baskets filled with regularly sized stones, and used to prevent and/or repair erosion. They are flexible and permeable structures which allow water to filter through them. Vegetation and other biota can also establish in/around the habitat they create.

Hazard: Means a source of or exposure to danger.

Invasive alien species control:

(a) to combat or eradicate an alien or invasive species; or

(b) where such eradication is not possible, to prevent, as far as may be practicable, the recurrence, re-establishment, re-growth, multiplication, propagation, regeneration or spreading of an alien or invasive species.

Implementing Entity: The entity responsible for the construction of WfWetlands rehabilitation interventions by means of various contracted teams.

Indigenous vegetation[8]: Refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.

[6] National Dust Regulations GN R827 (2013)
[7] NEMA
[8] GN R983 (2014, as amended) of NEMA

Interested and Affected Parties (I&APs)[9]:

(a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;

(b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; c) all organs of state which have jurisdiction in respect of the activity to which the application relates.

Intervention: An engineered structure such as a concrete or gabion weir, earthworks or revegetation that that achieves identified objectives within a wetland e.g. raising of the water table within a drainage canal.

Invasive species[10]: Means any species whose establishment and spread outside of its natural distribution range-

(a) threaten ecosystems, habitats or other species or have demonstrable potential to threaten ecosystems, habitats or other species; and

(b) may result in economic or environmental harm or harm to human health.

Listed invasive species: Any invasive species listed in terms of sections 66(1), 67(1), 70(1)(a), 71(3) and 71A of the National Environmental: Biodiversity Act (No. 10 of 2004).[11]

Maintenance period: The period after the Establishment Period (Practical Completion), up to and until the end of the Maintenance Period (i.e. a period of 12 months).

Maintenance[12]: Means actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint.

Mine:

(a) used as a noun-

any excavation in the earth, including any portion under the sea or under other water or in any residue deposit, as well as any borehole, whether being worked or not, made for the purpose of searching for or winning a mineral;

any other place where a mineral resource is being extracted, including the mining area and all buildings, structures, machinery, residue stockpiles, access roads or objects situated on such area and which are used or intended to be used in connection with such searching, winning or extraction or processing of such mineral resource; and

(b) used as a verb-

in the mining of any mineral, in or under the earth, water or any residue deposit, whether by underground or open working or otherwise and includes any operation or activity incidental thereto, in, on or under the relevant mining area.

Mitigation: Actions to reduce the impact of a particular activity.

Mitigation[13]: Means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible;

[9] Regulation 42 GN R983 (2014, as amended) of NEMA
[10] National Environmental Management: Biodiversity Act (No. 10 of 2004)
[11] Also refer to GN 864 (2016): Alien and Invasive Species Lists
[12] GN R983 (2014, as amended) of NEMA
[13] GN R983 (2014, as amended) of NEMA

Monitoring[14]**:** The repetitive and continued observation, measurement and evaluation of environmental criteria to follow changes over a period of time and to assess the efficiency of control measures.

Nursery conditions: This refers to the necessary conditions that must be in place for maintaining strong healthy growth in all container plant materials on site. This includes for the protection of all container plants against wind, frost, direct sunlight, pests, disease and drought. It also includes for the provision of adequate and suitable water supply, fertilisers and all other measures necessary to maintain strong and healthy plant growth.

Offensive odour: Any smell which is considered to be malodorous or a nuisance to a reasonable person.

Pollution[15]**:** Means any change in the environment caused by substances;

(ii) radioactive or other waves; or

(iii) noise, odours, dust or heat,

emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.

Post-construction: Refers to the period of 12 months after the completion of the construction works, the onset coinciding with the maintenance period..

Potentially hazardous substance: Any substance or mixture of substances, product or material declared to be a hazardous substance under section 2(1) of the Hazardous Substance Act (1973).

Pre-construction: Refers to the period leading up to the establishment on site by the Implementing Entity.

Project: A defined area for which an approved rehabilitation plan exists for the WfWetlands Programme.

Quaternary Catchment: A fourth order catchment in a hierarchal classification system in which a primary catchment is the major unit and that is also the "principal water management unit in South Africa"[16]

Reasonable: Means, unless the context indicates otherwise, reasonable in the opinion of the relevant environmental authority.

Rehabilitation: Refers to re-instating the driving ecological forces (including hydrological, geomorphological and biological processes) that underlie a wetland, so as to improve the wetland's health and the ecological services that it delivers; and

Restoring processes and characteristics that are sympathetic to and not conflicting with the natural dynamic of an ecological or physical system[17].

Significant impact: Means an impact that may have a notable effect on one or more aspects of the environment or may result in k with accepted environmental quality standards, thresholds or targets

[14] DEAT, 1998
[15] National Environmental Management Act (No. 107 of 1998, as amended)
[16] DWS Groundwater Dictionary. Available online: http://www.dwaf.gov.za/Groundwater/Groundwater_Dictionary/index.html?introduction_quaternary_catchment.htm
[17] Wetland Management Series: WET-Origins, WRC Report TT 334/08, March 2008

and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence.

Silt laden water: Means water (mostly overland surface runoff) containing a substantial concentration of suspended solids with increased turbidity. Usually occurs as a result of exposed/cleared ground surfaces, concentration of runoff and/or erosion of excavated or imported materials.

Site: This is the area described in the approved/authorised rehabilitation plan for the implementation of the rehabilitation measures. Where the area is not demarcated, it will include all adjacent areas, which are reasonably required for the activities for the Implementing Entity, and approved for such use by the Environmental Control Officer (ECO).

Slope: The inclination of a surface expressed as 1 unit of rise or fall for so many horizontal units.

Subsoil: The soil horizons between the topsoil horizon and the underlying parent rock.

Topsoil: The upper soil profile irrespective of the fertility appearance, structure, agriculture potential, fertility and composition of the soil, usually containing organic material and which is colour specific. Also referred to as the "O" and "A" horizons.

Waste: Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 the National Environmental Management: Waste Act (No. 59 of 2008)[18]. Examples include construction debris, chemical waste, used oils and lubricants, batteries, metal and wood off-cuts, excess cement/ concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

Watercourse:

(a) a river or spring;

(b) a natural channel in which water flows regularly or intermitted;

(c) a wetland, pan, lake or dam into which, or from which, water flows

A reference to a watercourse includes, where relevant, its bed and banks

Weir: A dam-type structure placed across a watercourse to raise the water table of the surrounding ground and trap sediment on the upstream face without preventing water flow. Weirs are generally used to prevent erosion from progressing up exposed gullies.

Wetland: Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water and which in normal circumstances supports or would support vegetation typically adapted to life in saturated soils[19] and,

Land where an excess of water is the dominant factor determining the nature of the soil development and the types of plants living there[20].

[18] National Environmental Management: Waste Act (No. 59 of 2008, as amended)
[19] National Water Act (No. 36 of 1998, as amended)
[20] Wetland Management Series: WET-Origins, WRC Report TT 334/08, March 2008

SECTION 1: SITE ESTABLISHMENT

Briefly describe where the site camp will be located. Also provide a layout on the next page.
Coordinates:
How will you demarcate the site camp (note no danger tape allowed)
What will the size of the site camp be?
Are there any sensitive areas, trees, shrubs or landscape features (e.g. a heritage site) that must be avoided to prevent disturbances and/or damage? How will disturbances or damage be prevented?

Is the site camp on a flat area (i.e. slope not exceeding 1:3)?	**Y**	**N**
Is the site camp located away from areas of stormwater concentration and areas prone to flooding?	**Y**	**N**
Are there any recently disturbed areas close to the site which can be used as a site camp?	**Y**	**N**
Is there sufficient space available at the identified site to accommodate all site camp components i.e. ablution facilities, eating areas, laydown areas, stockpile areas, vehicle parking area, concrete wash water settling area?	**Y**	**N**
Can the site camp remain at one location? I.e. it does not need to be moved on a regular basis (i.e. every two to four weeks) due to intervention sites being far apart?	**Y**	**N**

If, "No", attach the approved for request for deviation form to the back of this document.

Indicate the following (ignore if not relevant): Ablution facilities, waste storage area (general and hazardous), eating area, laydown area, stockpile area, concrete/mortar mixing/batching area, concrete wash water settling system, site office, access, vehicle parking area, any stormwater diversion measures required, the wetland boundary and sensitive features that must be avoided.

Site camp layout (please use multiple layout plans if required).

SECTION 2: SITE DEMARCATION

Indicate the working area required for each intervention site.

Intervention No	Type of intervention	Area required (incl. temporary laydown and stockpile areas, topsoil stockpiling, equipment etc.)

How will you demarcate the working area required for each intervention?

SECTION 3: ACCESS ROUTES/HAUL ROADS

Length of new access road required for each intervention site.

Intervention No	Existing access (Y/N)?	Length of access road required

Describe how access roads will be made and demarcated (i.e. avoiding unnecessary access roads and the creation of multiple access roads).

**Include a simple layout indicating the proposed access routes as an addendum to this document.*

SECTION 4: MATERIALS HANDLING, USE AND STORAGE

Briefly list the materials (**including volumes**) to be used during construction (e.g. bidim, gabion baskets, stones, gravel, shuttering oil, cement, sand, MacMat-R, geotextile):		
Where will the materials be off-loaded?		
Where are you sourcing the material from?		
If it is not a commercial source, have you written obtained permission from the ECO and any other relevant party e.g. the landowner, provincial roads, Department of Mineral Resources? Please attached a copy of the written permission/consent to the end of this **METHOD STATEMENT**.	**Y**	**N**

Are the areas you've identified for stockpiling of bulk material outside of the wetland? If "No", consult with the ECO.	**Y**	**N**
Are the areas you've identified for stockpiling level (i.e. not steeper than 1:30)? If no, explain the measures which will be implemented to prevent materials washing away during rainfall.	**Y**	**N**
Have you planned how to get the materials from the stockpile/laydown area to the intervention working area? Please provide details on the proposed methodology below. Differentiate between the various materials where required.	**Y**	**N**
Do you have sufficient covered storage space for products such as cement, and shuttering oil? Please provide details of the storage areas to be used and the type of cover e.g. roofed, shade cloth, storage container.	**Y**	**N**
Do you need to stockpile bulk materials e.g. rock, sand next to an intervention? If "Yes", please provide details on the duration of stockpiling, the volume and the measures to be taken to avoid erosion of material and contamination of topsoil.	**Y**	**N**
Have you worked out a delivery schedule to avoid materials being stored on site for longer than 4 weeks?	**Y**	**N**
Is there any material which will be prone to become windblown e.g. sand? If yes, describe how you will contain the material.	**Y**	**N**

SECTION 5: SOLID WASTE MANAGEMENT AND DISPOSAL

What types of waste is expected to be generated during the construction period?		
List any wastes that are potentially hazardous[21] (e.g. empty sealant containers, materials from spill kit used to clean spillages, batteries, contents from portable toilets, herbicide containers):		
How will waste be stored on site (i.e. where and in what)?		
General:		
Hazardous:		
How often, how and where will waste be disposed of?		
General:		
Hazardous:		
Is a substantial quantity of vegetation clearance required?	**Y**	**N**

[21] Refer to National Environmental Management: Waste Amendment Act 26 of 2014 and SANS 10234

If “yes” indicate how vegetation material not removed as part of topsoil stripping will be dealt with e.g. chipping, brush packing, donate to local community.

** Please remember to clearly indicate waste storage areas on the layout plan.*

SECTION 6: HAZARDOUS CHEMICALS AND POTENTIAL HAZARDOUS SUBSTANCES

List potentially hazardous substances to be used on the project. *(Hazardous being defined in terms of Hazardous Substances Act (No.187 of 1993) and associated regulations as well as SANS 10234. Examples include, but are not limited to: drums of fuel, grease, oil, brake fluid, hydraulic fluid, paint, batteries and herbicides (for alien plant clearing)).*

How and where will these substances be stored?

How will these substances be applied or dispensed?

How will spills be prevented?

In the event of a spill, how will it be mitigated?

Procedure:
Materials:
Person responsible and contact details:

**Attach the relevant Material Safety Data Sheet (MSDS) of hazardous materials to be stored on site as an addendum to this document.*

SECTION 7: FUEL

What is the volume of fuel planned to be stored on site?

How and where will fuel be stored?

How will fuel be dispensed?

What precautions will be taken to prevent accidental spills or fires?

In the event of a spill, how will it be mitigated (i.e. cleaned up)?

Procedures:
Materials:
Person responsible and contact details:

How will hydrocarbon contaminated materials be managed and disposed of? Note hydrocarbon contaminated soil is only allowed to go to a Class A landfill (previously H:H landfill site).

SECTION 8: WATER USE

What source will be used to obtain water for construction purposes?

What source will be used to obtain water for drinking and sanitation purposes?

SECTION 9: CONCRETE BATCHING AND CEMENT HANDLING

List activities where concrete or mortar will be used:

If ready mix is not used, where and how will concrete be mixed and how will it be transported to the intervention location?

How will cement laden runoff be managed? Specify for the concrete mixing area as well as washing of equipment.

Where and how will cement be stored?

How and where will cement bags be stored until taken off site?

How will excess concrete and concrete remains be disposed of?

SECTION 10: ABLUTION FACILITIES

How many people will be on site?

How many toilets will be required at a ratio of 1 toilet for every 15 people?

What type of toilet will be used (e.g. chemical or pit latrine) and where will it be located?

If chemical toilets are used, specify how and when they'll be serviced.

SECTION 11: EATING AREAS

Where will the eating area be located?

How will you prevent littering around the eating area?

** Also clearly indicate the designated eating area(s) on the layout plan.*

SECTION 12: VEHICLES AND EQUIPMENT

Describe the number and type of vehicles to be used on site.

Where will vehicles be parked or equipment stored overnight, during weekends and during holidays?

Describe the procedure to be implemented for dealing with vehicles or equipment leaking oil or fuel:

Describe emergency equipment maintenance procedures:

Procedure:
Materials:
Person responsible:

SECTION 13: NOISE

Are there any houses nearby? Do you need inform the landowners of any noisy activities that will take place? How will this be done?

Describe the measures to be implemented to prevent excessive noise disturbance during construction:

SECTION 14: DUST

What is the distance to the closest occupied building and what type of building is it (e.g. house, school, clinic, etc.)

List activities and material that might lead to the generation of dust:

If closer than 100m from a sensitive receptor e.g. occupied building, road, orchard, describe the activities to be implemented to limit and mitigate the generation of dust:

SECTION 15: IMPLEMENTING ENTITY'S SAFETY HEALTH ENVIROMENT (SHE) OFFICER

Who will be responsible to ensure that Health and Safety and Environmental Requirements are implemented on site? Describe responsibilities of the relevant person:

Name:
Responsibilities:
Reporting to:

SECTION 16: ENVIRONMENTAL AWARENESS TRAINING

Describe how environmental awareness and training for senior staff will be addressed:

Describe how environmental awareness and training for general labour will be addressed:

** Please include a copy of the training material and attendance register in the environmental folder.*

SECTION 17: FIRE CONTROL

List activities on site with a fire risk e.g. smoking areas, generators.

How will fires be prevented?

Describe the procedure to be followed in case of a fire on site:

Process:
Materials:

Responsible person:

SECTION 18: COMMUNITY RELATIONS

Who is/are the landowner(s) of the property/properties where work will be conducted?

Has the landowner been contacted and notified of construction commencing and are there any specific concerns or requests which need to be taken into account?

Describe how good community relationships will be ensured (e.g. complaints register, contact details of Implementing Entity on site):

SECTION 19: PROTECTION OF FAUNA AND FLORA

Are you working in a conservancy, nature reserve or biosphere? If, yes, what are the precautions to be taken to avoid the accidental or intentional killing and/or trapping of animals?

Are you aware of any nesting or breeding sites close to any of the interventions?

Describe the procedure to be followed pre-construction to check for slow moving animals in the vicinity of the construction area.

Describe the procedure to be followed to check excavations of 0.5m and deeper for trapped animals.

If you are working in an area with potentially dangerous animals, describe the measures to be taken to ensure the safety of staff.

Are there any trees or shrubs that may not be disturbed or damaged? Have these been clearly marked to prevent disturbances and potential damage?

SECTION 20: STORMWATER MANAGEMENT

Is the site located in floodplain or valley? If “Yes”, have you verified the typical rainfall patterns in the area and when increased flow/flooding can be expected?

Are you aware of any major dams or impoundments upstream of the site? If yes, do you have the contact details of the entity/responsible person in control of releases from the dam or impoundment and have you notified them of work being undertaken downstream?

Are you doing work in the "seasonal" or "permanent zone" of the wetland i.e. an area that is seasonally or permanently wet? If "Yes", describe the dewatering procedures to be followed (i.e. will pumping be required, where will the pumped water be discharged, how will you reduce sediment loads in pumped water, how will you prevent scouring at the pipe outlet?)

Do you need to divert flow to enable construction/work being undertaken? If "Yes", provide details on the type and duration of the diversion.

SECTION 21: EROSION AND SEDIMENTATION CONTROL

How will you prevent the erosion of access roads?

Will there be significant exposed areas (areas exceeding $10m^2$) during the rainfall season? If "Yes", how will you protect bare soil surfaces exposed for a month or longer (e.g. stormwater diversion, temporary revegetation, geotextile)?

Do you need to work on steep (1:4) slopes? If "Yes", describe the measures to be implemented to avoid the erosion of exposed ground surfaces, excavated material and construction material.

Are there any known stormwater structures discharging towards the site e.g. culverts, stormwater outlets. If "Yes", is the diversion of the stormwater required to protect the site from erosion and how will it be done?

SECTION 22: PROTECTION OF ARCHAEOLOGICAL AND PALAEONTOLOGICAL SITES

Are you aware of any known heritage artefacts (e.g. old buildings, Stone Age sites, shell middens, caves, historic grave sites, monuments) close to the site? If "Yes", describe how you will protect the site.

Describe the procedure to be followed in the event that an object of heritage, archaeological or paleontological is discovered:

Section	Template available
1. Rehabilitation Plan and EMP	
2. Implementing Entity Agreements	
2.1. Undertaking in terms of Environmental Authorisation, Environmental Management Programme, Rehabilitation Plan and submitted Method Statements	Yes
3. Approvals and Licenses	
3.1. Environmental Authorisation	
3.2. Section 21(c) and (i) General Authorisation	
3.3. Waste license (if applicable)	
4. Communication	
4.1. Important correspondence e.g. notice to Competent Authority of commencement of construction	
4.2. Copy of public complaints register	Yes
5. Site Management	
5.1. Approved layout	
5.2. Site instructions (or copies thereof)	
6. Environmental Training	
6.1. Proof of toolbox talks, environmental awareness and induction (incl. attendance register and training material)	
7. Method Statements	
7.1. Combined method statements	Yes
7.2. Additional method statements	**Yes**
8. Records	
8.1. Record of waste generation – quantity, type, fate (incl. general/hazardous, liquid/solid)	
8.2. Proof of legal/safe waste disposal	
8.3. Record of chemicals on site and Material Safety Data Sheets (MSDS)	
8.4. Record of water usage (if applicable)	
8.5. Request for deviations	Yes
9. Audits	
9.1. Baseline Audit	Yes
9.2. ECO audit reports	
9.3. Internal audits/check conducted by the Implementing Entity	Yes
9.4. Incident and non-conformance reports	Yes
9.5. Site closure	Yes

7 Method Statements

7.2 Additional method statements

INFORMATION ON METHOD STATEMENTS

Method Statements are to be completed by the person undertaking the work (i.e. the Implementing Entity). The Method Statement will enable the potential negative environmental impacts associated with the proposed activity to be assessed.

The Method Statement can only be implemented once approved by the PC in consultation with the ECO.

The Implementing Entity (and, where relevant, any sub-contractors) must also sign the Method Statement, thereby indicating that the works will be carried out according to the methodology contained in the approved Method Statement.

The PC and/or ECO will use the Method Statement to audit compliance by the Implementing Entity with the requirements of the approved Method Statement.

Changes to the way the works are to be carried out must be reflected by amendments to the original approved Method Statement; amendments require the signature of the PC, denoting that the changed methodology or works are necessary for the successful completion of the works, and where applicable the PC will consult with the ECO regarding to environmental concerns. The Implementing Entity will also be required to sign the amended Method Statement thereby committing him/herself to the amended Method Statement.

This Method Statement MUST contain sufficient information and detail to enable the PC (and ECO were applicable) to apply his/her mind to the potential impacts of the works on the environment. The Implementing Entity will also need to thoroughly understand what is required of him/her in order to undertake the works.

THE TIME TAKEN TO PROVIDE A THOROUGH, DETAILED METHOD STATEMENT IS TIME WELL SPENT. INSUFFICIENT DETAIL WILL RESULT IN DELAYS TO THE WORKS WHILE THE METHOD STATEMENT IS REWRITTEN TO THE ASD's SATISFACTION

METHOD STATEMENT

PROJECT NAME: ……

IMPLEMENTING ENTITY: ……

DATE: ……

PROPOSED ACTIVITY *(give title of method statement):*

E.g. construction of diversion structure, temporary damming of stream, deviation from standard rehabilitation procedures

Scope	
Potential Impacts	E.g. litter, spills, damage to flora, contamination of water
Start Date:	
End Date:	
Description (i.e. how will the Method Statement be implemented?):	
Location:	
Person(s) responsible for implementing (Name and designation):	

DECLARATIONS

1) Environmental Consultant/Environmental Control Officer

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

_____	_____	_____
Signed	Print name	Dated

2) Implementing Entity

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the PC/ECO will audit my compliance with the contents of this Method Statement

_____	_____	_____
Signed	Print name	Dated

3) Engineer/Engineer's Representative

The works described in this Method Statement are approved.

_____	_____	_____
Signed	Print name	Dated

4) Approving authority: PC

_____	_____	_____
Signed	Print name	Designation

Dated: _____

Section	Template available
1. Rehabilitation Plan and EMP	
2. Implementing Entity Agreements	
2.1. Undertaking in terms of Environmental Authorisation, Environmental Management Programme, Rehabilitation Plan and submitted Method Statements	Yes
3. Approvals and Licenses	
3.1. Environmental Authorisation	
3.2. Section 21(c) and (i) General Authorisation	
3.3. Waste license (if applicable)	
4. Communication	
4.1. Important correspondence e.g. notice to Competent Authority of commencement of construction	
4.2. Copy of public complaints register	Yes
5. Site Management	
5.1. Approved layout	
5.2. Site instructions (or copies thereof)	
6. Environmental Training	
6.1. Proof of toolbox talks, environmental awareness and induction (incl. attendance register and training material)	
7. Method Statements	
7.1. Combined method statements	Yes
7.2. Additional method statements	Yes
8. Records	
8.1. Record of waste generation – quantity, type, fate (incl. general/hazardous, liquid/solid)	
8.2. Proof of legal/safe waste disposal	
8.3. Record of chemicals on site and Material Safety Data Sheets (MSDS)	
8.4. Record of water usage (if applicable)	
8.5. Request for deviations	**Yes**
9. Audits	
9.1. Baseline Audit	Yes
9.2. ECO audit reports	
9.3. Internal audits/check conducted by the Implementing Entity	Yes
9.4. Incident and non-conformance reports	Yes
9.5. Site closure	Yes

8 Records

8.5 Request for deviations from standard EMPr or Rehabilitation Plan requirement

PROJECT NAME:	……
IMPLEMENTING ENTITY:	……
DATE:	……

DEVIATION 1 *(Implementing Entity to complete)*

Description of deviation	*E.g. mixing of concrete in wetland*
Reason for deviation	*E.g. major wetland system resulting in excessive transport distances*
Start Date:	
End Date:	
Relevant section in EMPr	
Potential impacts associated with deviation	*E.g. concrete spills in wetland, additional vegetation clearance, water pollution*
Mitigation measures identified	*E.g. mixing boards, dedicated wash bins, no cement storage in wetland next to mixing area, regular clean-up*

DEVIATION 2 *(Implementing Entity to complete)*

Description of deviation	
Reason for deviation	
Start Date:	
End Date:	
Relevant section in EMPr	
Potential impacts associated with deviation	
Mitigation measures identified	

PC CHECKLIST

Does the deviation carry a high risk e.g. pollution, structure failure	Yes	No	Unsure	If “yes” or “unsure” consult with Engineer
Does the proposed deviation trigger a new listed activity	Yes	No	Unsure	If “yes” or “unsure” consult with EAP
Does the deviation involve a change in design of the IP	Yes	No	Unsure	If “yes” or “unsure” consult with Engineer and Wetlander
Is the deviation outside the approved wetland system?	Yes	No	Unsure	If “yes” or “unsure” consult with EAP

DECLARATIONS

1) Environmental Consultant/Environmental Control Officer

The work described in this request for deviation does not trigger any additional listed activities and will not result in excessive environmental damage:

_____	_____	_____
Signed	Print name	Dated

2) Person undertaking the works/Implementing Entity

I understand the scope of deviation requested and will implement the mitigation measures as indicated.

_____	_____	_____
Signed	Print name	Dated

3) Engineer/Engineer's Representative

The works described in this Method Statement are approved.

_____	_____	_____
Signed	Print name	Dated

4) Approving authority

_____	_____	_____
Signed	Print name	Designation

Dated _____

Section	Template available
1. Rehabilitation Plan and EMP	
2. Implementing Entity Agreements	
2.1. Undertaking in terms of Environmental Authorisation, Environmental Management Programme, Rehabilitation Plan and submitted Method Statements	Yes
3. Approvals and Licenses	
3.1. Environmental Authorisation	
3.2. Section 21(c) and (i) General Authorisation	
3.3. Waste license (if applicable)	
4. Communication	
4.1. Important correspondence e.g. notice to Competent Authority of commencement of construction	
4.2. Copy of public complaints register	Yes
5. Site Management	
5.1. Approved layout	
5.2. Site instructions (or copies thereof)	
6. Environmental Training	
6.1. Proof of toolbox talks, environmental awareness and induction (incl. attendance register and training material)	
7. Method Statements	
7.1. Combined method statements	Yes
7.2. Additional method statements	Yes
8. Records	
8.1. Record of waste generation – quantity, type, fate (incl. general/hazardous, liquid/solid)	
8.2. Proof of legal/safe waste disposal	
8.3. Record of chemicals on site and Material Safety Data Sheets (MSDS)	
8.4. Record of water usage (if applicable)	
8.5. Request for deviations	Yes
9. Audits	
9.1. Baseline Audit	**Yes**
9.2. ECO audit reports	
9.3. Internal audits/check conducted by the Implementing Entity	Yes
9.4. Incident and non-conformance reports	Yes
9.5. Site closure	Yes

9 Audits

9.1 Baseline audit/ inspection prior to commencement of construction

PROJECT NAME:	……
IMPLEMENTING ENTITY:	……
DATE:	……

SECTION 1: WETLAND ZONE IN WHICH WORK WILL BE UNDERTAKEN:

Permanent	Seasonal	Temporary	Outside wetland boundary

SECTION 2: CONDITION OF VEGETATION

Coverage:	Poor	Moderate	Good
Species diversity:	Poor	Moderate	Good
Grazing in wetland:	Yes	No	
Harvesting of vegetation in wetland:	Yes	No	
Level of alien invasive species infestation:	Low	Moderate	High

Insert photos:

SECTION 3: SOIL

Topsoil depth:	≥10cm	≥30cm	≥ 50cm
Peat know to be present?	Yes	No	
Evidence of erosion	Yes	No	
Type of erosion	Dryland	Gullies/donga	In-stream (undercutting, lateral, scouring)
	Stormwater outlets	Dispersed overland flow	Tunnelling (dispersive soils)

SECTION 4: IS THERE ANY EXISTING WASTE OR SPOIL ON SITE?

Yes	No

If yes, specify the type and estimated quantity

Insert photos:

SECTION 5: ARE THERE EXISTING ALIEN INVASIVE SPECIES ON THE SITE?

Yes	No

If yes, list the species

Are any of the species Category 1a or b species? (Alien and Invasive Species Regulations, 2014 - GN R598/2014)

Yes	No

If yes, list the species and number/density of plants.

Insert photos:

SECTION 6: ARE THERE EXISTING ACCESS ROADS TO THE SITE?

Yes	No

If yes, what is the condition of the road(s)?

Good	Moderate	Poor

SECTION 7: ARE THERE OTHER IMPACTED OR DISTURBED AREAS

Cleared area	Mining area	Kraal	Previous site camps	Ploughed agricultural land
Roads	Settlements	Other:		

SECTION 8: EXISTING WATER QUALITY ISSUES

High sediment loads (murky/cloudy water)	Eutrophication (excess algal growth)	High TDS (salt deposits)	Low pH (orange coloured water)	*E. coli* (leaking sewer lines, concentration of animals)

SECTION 9: IS THERE EXISTING FENCING ON THE PROPERTY WHERE THE WORK WILL BE CONDUCTED?

Yes	No

If yes, what type of fencing and what is the condition of the fencing?

Insert photos:

SECTION 10: ARE THERE ANY KNOW PROTECTED PLANT SPECIES ON SITE?

Yes	No

If yes, list the species

Insert photos:

SECTION 11: ARE THERE ANY SIGNIFICANT TREES OR CLUMPS OF TREES WHICH NEED TO BE CONSERVED?

Yes	No

If yes, specify the species and location.

Insert photos:

SECTION 12: ARE THERE ANY KNOWN OR VISIBLE HERITAGE OBJECTS (E.G. OLD KRAAL, OLD FURROW, CORNER POSTS, OLD BUILDINGS)?

Yes	No

If yes, specify the type of object and location.

Insert photos:

SECTION 13: ARE THERE ANY EXISTING ANIMAL (DOMESTIC OR WILD) CROSSINGS ON OR CLOSE TO THE SITE?

Yes	No

If, yes, will the planned work impact on the crossings and movement of the animals?

Yes	No

SECTION 14: ARE THERE ANY EXISTING SERVICES ON OR NEAR THE SITE (E.G. POWER LINES, SUB-STATIONS, PIPELINES, TELEPHONE LINES)?

Yes	No

If yes, specify the type of infrastructure and whether it will be impacted by the activities on site

Insert photos:

Section	Template available
1. Rehabilitation Plan and EMP	
2. Implementing Entity Agreements	
2.1. Undertaking in terms of Environmental Authorisation, Environmental Management Programme, Rehabilitation Plan and submitted Method Statements	Yes
3. Approvals and Licenses	
3.1. Environmental Authorisation	
3.2. Section 21(c) and (i) General Authorisation	
3.3. Waste license (if applicable)	
4. Communication	
4.1. Important correspondence e.g. notice to Competent Authority of commencement of construction	
4.2. Copy of public complaints register	Yes
5. Site Management	
5.1. Approved layout	
5.2. Site instructions (or copies thereof)	
6. Environmental Training	
6.1. Proof of toolbox talks, environmental awareness and induction (incl. attendance register and training material)	
7. Method Statements	
7.1. Combined method statements	Yes
7.2. Additional method statements	Yes
8. Records	
8.1. Record of waste generation – quantity, type, fate (incl. general/hazardous, liquid/solid)	
8.2. Proof of legal/safe waste disposal	
8.3. Record of chemicals on site and Material Safety Data Sheets (MSDS)	
8.4. Record of water usage (if applicable)	
8.5. Request for deviations	Yes
9. Audits	
9.1. Baseline Audit	Yes
9.2. ECO audit reports	
9.3. Internal audits/check conducted by the Implementing Entity	**Yes**
9.4. Incident and non-conformance reports	Yes
9.5. Site closure	Yes

9 Audits

9.3 Internal audits/check conducted by the Implementing Entity

PROJECT NAME:	……
IMPLEMENTING ENTITY:	……
DATE:	……
WEEK:	*E.g. Week 1 / Week 2*……

SECTION 1: SITE CONDITIONS

SECTION 2: LAYDOWN AREAS & SITE OFFICES

		EVALUATION		
ITEM	**DESCRIPTION**	**Not to Standard**	**To Standard**	**NOTES**
2.1	Litter control			
2.2	Dust suppression			
2.3	Erosion control			
2.4	Storm water / Runoff control			
2.5	Toilets			
2.6	Fuel & oil storage & dispensing			
2.7	Material handling or Storage			
2.8	Waste management			
2.8.1	*Domestic Waste*			
2.8.2	*Hazardous Waste*			
2.9	Noise control			

SECTION 3: CONSTRUCTION SITES

		EVALUATION		
ITEM	**DESCRIPTION**	**Not to Standard**	**To Standard**	**NOTES**
3.1	Litter control/Recycle			

3.2	Dust suppression			
3.3	Erosion control			
3.4	Toilets			
3.5	Eating areas			
3.6	Material handling and Storage			
3.7	No go areas, natural features and trees have not been damaged			
3.8	Drip trays			
3.9	Waste management			
3.9.1	*Domestic Waste*			
3.9.2	*Hazardous Waste*			
3.10	Noise control			
3.11	Environmental Awareness Training			

SECTION 4: COMPLAINCE WITH THE EA CONDITIONS AND EMP AND/OR ENVIRONMENTAL INCIDENTS

SECTION 5: GENERAL NOTES

Section	Template available
1. Rehabilitation Plan and EMP	
2. Implementing Entity Agreements	
2.1. Undertaking in terms of Environmental Authorisation, Environmental Management Programme, Rehabilitation Plan and submitted Method Statements	Yes
3. Approvals and Licenses	
3.1. Environmental Authorisation	
3.2. Section 21(c) and (i) General Authorisation	
3.3. Waste license (if applicable)	
4. Communication	
4.1. Important correspondence e.g. notice to Competent Authority of commencement of construction	
4.2. Copy of public complaints register	Yes
5. Site Management	
5.1. Approved layout	
5.2. Site instructions (or copies thereof)	
6. Environmental Training	
6.1. Proof of toolbox talks, environmental awareness and induction (incl. attendance register and training material)	
7. Method Statements	
7.1. Combined method statements	Yes
7.2. Additional method statements	Yes
8. Records	
8.1. Record of waste generation – quantity, type, fate (incl. general/hazardous, liquid/solid)	
8.2. Proof of legal/safe waste disposal	
8.3. Record of chemicals on site and Material Safety Data Sheets (MSDS)	
8.4. Record of water usage (if applicable)	
8.5. Request for deviations	Yes
9. Audits	
9.1. Baseline Audit	Yes
9.2. ECO audit reports	
9.3. Internal audits/check conducted by the Implementing Entity	Yes
9.4. Incident and non-conformance reports	**Yes**
9.5. Site closure	Yes

9 Audits

9.4 Incident and non-conformance reports

9.4.1 Environmental Incident Report

PROJECT NAME:	……
IMPLEMENTING ENTITY:	……
DATE:	……
REVISION:	……

SECTION 1: DESCRIPTION OF INCIDENT

SECTION 2: REMEDIAL ACTION REQUIRED

Remedial Action Due Date:	

SECTION 3: RELEVANT DOCUMENTATION

SECTION 4: SIGNATURES

ECO:		**Implementing Entity:**	
Name:		**Name:**	
Date:		**Date:**	

SECTION 5: REMEDIAL ACTION COMPLETED

Implementer to sign when remedial action has been completed and return original to ECO:	
Name:	
Date:	

SECTION 6: REMEDIAL ACTION VERIFIED

ECO:		**Implementing Entity:**	
Name:		**Name:**	
Date:		**Date:**	

SECTION 7: DRAWING/SKETCH

9.4.2 Environmental Non-Conformance Notice

PROJECT NAME:	……
IMPLEMENTING ENTITY:	……
DATE:	……
REVISION:	……

SECTION 1: INCIDENT SEVERITY

High	Medium	Low
Number of previous similar non-conformances on same contract:		

SECTION 2: DESCRIPTION OF INCIDENT

SECTION 3: DRAWING/SKETCH

SECTION 4: REMEDIAL ACTION REQUIRED

Remedial Action Due Date:	

SECTION 5: DRAWING/SKETCH

SECTION 6: RELEVANT DOCUMENTATION

SECTION 7: SIGNATURES

ECO:		**Implementing Entity:**	
Name:		**Name:**	
Date:		**Date:**	

SECTION 8: REMEDIAL ACTION COMPLETED

Implementer to sign when remedial action has been completed and return original to ECO:	
Name:	
Date:	

SECTION 9: REMEDIAL ACTION VERIFIED

ECO:		**Implementing Entity:**	
Name:		**Name:**	
Date:		**Date:**	

Section	Template available
1. Rehabilitation Plan and EMP	
2. Implementing Entity Agreements	
2.1. Undertaking in terms of Environmental Authorisation, Environmental Management Programme, Rehabilitation Plan and submitted Method Statements	Yes
3. Approvals and Licenses	
3.1. Environmental Authorisation	
3.2. Section 21(c) and (i) General Authorisation	
3.3. Waste license (if applicable)	
4. Communication	
4.1. Important correspondence e.g. notice to Competent Authority of commencement of construction	
4.2. Copy of public complaints register	Yes
5. Site Management	
5.1. Approved layout	
5.2. Site instructions (or copies thereof)	
6. Environmental Training	
6.1. Proof of toolbox talks, environmental awareness and induction (incl. attendance register and training material)	
7. Method Statements	
7.1. Combined method statements	Yes
7.2. Additional method statements	Yes
8. Records	
8.1. Record of waste generation – quantity, type, fate (incl. general/hazardous, liquid/solid)	
8.2. Proof of legal/safe waste disposal	
8.3. Record of chemicals on site and Material Safety Data Sheets (MSDS)	
8.4. Record of water usage (if applicable)	
8.5. Request for deviations	Yes
9. Audits	
9.1. Baseline Audit	Yes
9.2. ECO audit reports	
9.3. Internal audits/check conducted by the Implementing Entity	Yes
9.4. Incident and non-conformance reports	Yes
9.5. Site closure	**Yes**

9 Audits

9.5 Site closure

PROJECT NAME:	……
IMPLEMENTING ENTITY:	……
DATE:	……

SECTION 1: SITE CLOSURE INSPECTION SHEET

Slope:	
Alien invasives:	
Topsoil:	
Anti-erosion:	
Waste:	
Other:	
Timeframe for completion:	

PC signature	Implementing Entity signature
Date	Date

SECTION 2: POST SITE CLOSURE INSPECTION COMMENTS

Slope:	
Alien invasives:	
Topsoil:	
Anti-erosion:	
Waste:	
Other:	

Outstanding items:

1._____

2._____

3._____

Completion date: _____

PC signature	Implementing Entity signature
Date	Date

Annexure C: Sensitive Areas

Sensitive areas (incl. delineated wetland boundary)

This page is left blank intentionally

Annexure D: Minimum Standards for Construction and Maintenance

Note that maintenance information of structures (position, numbering and BoQ) will be determined as part of the planning process (by the PC and/or the Engineer) and will be included in the Rehabilitation Plan together with new wetlands. This information will be available on WetIS for inclusion in the PIPs. It is the Implementing Entity's responsibility to make provision for maintenance activities in the PIP as discussed and agreed with the PC.

Concrete Batching

- Concrete shall be mixed according to the correct MPa and mix information as specified in the construction notes of the respective design drawings.
- All material used in the mixing of concrete are to be of good quality, clean and clear of any organic material.
- Manufacturer's directions for mixing, consistency and treatment after pouring shall be complied with.
- Cement shall be stored in dry conditions for no longer than six weeks after delivery.
- When cement is stored temporarily infield it shall be kept on a dry waterproof base with a waterproof cover.
- The batching of concrete shall be done on a smooth impermeable surface (e.g. shutter ply-wood sheets). The batching area shall be prepared by cutting (not removing) the existing vegetation and covering the natural ground level (NGL) with Geotextile lining (minimum A4 grade). A sand retaining berm is to be constructed on top of the geotextile on the downstream end to contain any run-off. A 250µm plastic lining is to cover the geotextile and sand berm while secured to the NGL. The prepared area should be of sufficient size to prevent overspill of any material of substance. All wastewater resulting from batching of concrete shall be disposed of via a contaminated water management system and shall not be discharged into the environment.
- Contaminated water storage areas shall not be allowed to overflow and appropriate protection from rain and flooding shall be implemented.
- A demarcated site at least 20m away from water/ wetland edge shall be used for cement mixing. No batching activities shall occur directly on unprotected ground.
- Empty cement bags shall be stored in weather proof containers to prevent windblown cement dust and water contamination. Empty cement bags shall be disposed of on a regular basis via the solid waste management system, and shall not be used for any other purpose. Unused cement bags shall be stored so as not to be affected by rain or runoff events. In this regard, closed steel containers shall be used for the storage of cement powder and any additives.
- The Implementing Entity shall ensure that sand, aggregate, cement or additives used during the mixing process are contained and covered to prevent contamination of the surrounding environment.
- The Implementing Entity shall take all reasonable measures to prevent the spillage of cement/ concrete during batching and construction operations. During pouring, the soil surface shall be protected using plastic and all visible remains of concrete shall be physically removed on completion of the cement/ concrete pour and appropriately disposed of. All spoiled and excess

aggregate/ cement/ concrete shall be removed and disposed of via the solid waste management system.

- Construction using shuttering shall take into consideration the structure design dimensions and safe working heights to prevent over extension of shuttering. Steel shuttering panel sizes shall be used to match the dimensions of the final concrete section as close as possible.
- Concrete will be mixed and used on the same day. Time from mixing to final compaction should not exceed 45 minutes.
- The maximum haul distance of mixed concrete by means of wheel barrows should be limited to ensure the maximum time from mixing to final compaction does not exceed 45 minutes.
- Where sand, stone and cement are transported by wheelbarrow to their point of mixing the distance travelled should be limited to 150m.
- Where applicable, the location of the batching site (including the location of cement stores, sand and aggregate stockpiles) shall be as approved by the PC. The concrete batching plant shall be kept neat and clean at all times.
- Water used for mixing purposes will be of suitable non-potable quality and may not be obtained from natural water resources.

Concrete Structures:

- Concrete mix to follow the design specification.
- Participants shall be trained in concrete mixing and placing by an accredited organisation prior to performing construction of concrete structures.
- Concrete to be placed in 300mm layers and vibrated using a concrete vibrator.
- Minimum 50mm cover required on all concrete reinforcing and mesh unless otherwise specified.
- 250µm plastic sheets to be placed under structure.
- All concrete walls to be fully supported until they are backfilled to the designed level.
- All mesh reinforcing to have 500mm overlaps between sheets.
- Buttresses and walls to be cast monolithically with footing.
- Construction joints to be used wherever new concrete is cast against previously cast concrete.
- If rebar or mesh crosses a construction joint, it should be continuous through the joint and extend 600mm into each side.
- Foundation improvement to be constructed from 70kg sandbags made of BIDIM A4 and filled with sand or well graded gravel, where indicated.

Gabion Structures:

- Gabion work shall be done according to design specifications.
- Participants shall be trained in gabion construction by an accredited organisation prior to performing placing or construction of gabion structures.
- Gabion baskets and Reno mattresses to be constructed of minimum double twisted, hexagonal galfan galvanised wire mesh of nominal diameter and 80mm mesh. Frame wire to be 3.4mm outside diameter (o/d) and mesh wire to be 2.7mm o/d with partitions at 1m centres.

- Support and binding wire shall be a minimum 2.2mm. Lacing shall be done according to specification.
- Support wires (bracing) shall be in place according to manufacturer's specifications.
- All adjoining baskets shall be laced together according to manufacturer's specifications.
- Geotextile shall line all faces of the gabion baskets that are exposed to earth and certain water exposed sides with a minimum of 200mm overlap in all directions and stitched with either polyester of galvanised wire at 300mm c/c.
- Water corrosivity shall be determined at each site; if necessary PVC coated gabion gabion wire shall be used as specified.
- Soil dispersivity shall be determined at each site. If dispersive soils are detected, the ECO / Engineer shall be contacted.
- Density of fill material shall satisfy the gabion design. Clay bricks, weathered rock and sandstone and shale shall not be used as fill material. Any unconventional fill material shall be approved by the ECO / Engineer.
- Fill material shall not be smaller than mesh size.
- Where fill material is hauled to its point of placement by means of wheelbarrows, the haul distance shall not be greater than 150m.

Stone Masonry Structures:

- Stone to be packed and mortared in place using concrete with specified strength.
- Concrete mix to follow the design specification
- 100mm - 200mm stone to be used in all stone masonry, gabions and Reno mattresses. Stone fill must be non-friable & insoluble e.g. Granite, basalt, limestone or sandstone.

Geo Cells:

- Geo cells shall not be used in conditions that exceed their design specifications.
- Geo cell material shall be UV resistant.
- Geo cells shall be anchored in by the "trench" method and in such a way that prevents undermining of the cells.
- Fill material shall conform to the design specifications. The following general rules shall be applied: If soil is used to fill the cells, it shall be re-vegetated immediately with optimum prepared soil conditions.
- If concrete is used to fill the cells, some degree of permeability of the structure shall be permitted. If concrete is used as fill, concrete baffles should be inserted or as per specified design. Rock is not suitable for this purpose.

Earth Works

- Excavations may not exceed 1.5m depth without stepping, shoring and/or reinforcement.
- All excavated material temporarily stored shall be placed on Geotextile sheets covering the NGL. If stockpiled for extended periods, it will be done so at predetermined positions approved by the ECO.
- Excavation and compaction must comply with design specifications.

- The ECO / Engineer must be consulted for work undertaken in dispersive, unstable and organic soils.
- Backfilling in trenches must be done in layers of thickness not exceeding 100mm before compaction. Each layer shall be compacted using hand compactors or mechanical rammers at optimum moisture content.
- Where excavation material is hauled by means of wheelbarrows, the haul distance shall not be greater than 150m.

All earthworks shall be undertaken in such a manner so as to minimise the extent of any impacts caused by such activities, particularly with regards to erosion and dust generation. No equipment associated with earthworks shall be allowed outside of the Site and defined access routes unless expressly permitted by the ECO / Engineer.

Rock Packing:

- Stone must be non-friable and insoluble, e.g. granite, basalt, limestone or sandstone
- Rock packs placed across a stream to be tied min 1m into each bank.
- The ECO must approve the source of rocks if not supplied by suitable rock supplier.
- The haul distance may not be greater than 150m where rocks are transported to their point of placement by means of wheel barrows
- The size of rocks must comply with the specifications shown on the drawings and must be handled in a safe manner particularly during offloading/placing. Heavy duty gloves to be worn when handling rocks.

Ecologs:

- Wooden pegs used to anchor EcoLogs are to be no less than 40mm diameter and 1000mm in length.
- Pegs should protrude no less than 600mm from the soil @ 1000 c/c.

MacMat / MacMat-R

- MacMat / MacMat-R to be installed to manufacturers specifications.

Working with Wire (Ecologs, fencing, silt traps)

- Wire used must comply with the engineer's specifications.
- The appropriate tools are to be used for safe handling of wire.
- Heavy duty gloves must be worn when handling wire.
- No loose wire/sharp edges are to remain on completed interventions.
- All excess wire must be removed from the site.
- Stakes used for pegging should not present a tripping/piercing risk (as far as practically possible).

Annexure E: Curriculum Vitae of EAP

Franci Gresse

Qualifications

BSc (Hons) Conservation Ecology

Member, International Association of Impact Assessment (IAIA)

Specialisation

Environmental Impact Assessment Practitioner

Years in industry

8.08

Franci is a senior environmental practitioner in Aurecon's Cape Town office. She has been involved in various environmental investigations, including environmental impact assessments (EIA's), environmental management plans (EMP's), environmental management programmes (EMP's), rehabilitation plans maintenance management plans (MMP's) and fatal flaw analysis.

Franci has been involved with the Working for Wetlands rehabilitation programme for the past five years, of which she has been acting as the Team Leader for the environmental assessment practitioners (EAP's) for the last three years. The Working for Wetlands project won the 2012 Aurecon Chairman's Award for its positive contribution to the natural and social environmental. In addition, Franci has also been involved with a number of projects in the renewable energy sector.

Franci served on the committee of the South African affiliate of the International Association for Impact Assessment (IAIA) for the Western Cape Branch from 2009 to 2011, and remains a member. She completed a Bachelor of Science and an Honours Degree in Conservation Ecology at the University of Stellenbosch (South Africa).

Experience

Working for Wetlands plan 2016 - 2018, Regional South Africa, Department of Environmental Affairs: Natural Resource Management Directorate, 06/2016 - Date, Project Leader

The Natural Resource Management Directorate of the Department of Environmental Affairs appointed Aurecon to provide environmental and engineering services for the Working for Wetlands Programme which is a national wetland rehabilitation programme. Responsibilities include the management and coordination of the overall project, management of the environmental authorisation component of the project, as well as the compilation of basic assessment reports (BAR) for the country. Other responsibilities include the compilation of wetland rehabilitation plans for the Western Cape, Northern Cape and Limpopo Provinces, liaison with authorities and the public (public participation process) and management of wetland specialists.

Integrated Environmental Impact Assessment (EIA) for the proposed extension of the Ash Dam facility at Kriel power station, Mpumalanga Province, South Africa, Eskom Holdings, 06/2016 - date, Project Leader

Appointed by Eskom to conduct an integrated environmental impact assessment (EIA) for the proposed construction of a fourth ash dam facility at the Kriel power station. Responsible for the general project management and finances, authority liaison and the compilation and review of the EIA documentation.

Amended Environmental and Socio-Economic Impact Assessment for a concentrated solar plant facility near Arandis in the Erongo Region, 02/2016 – 10/2016, Project Leader

Aurecon was appointed by the NamPower to amend the Environmental Clearance Certificate (ECC) issued for the Erongo Coal-fired Power Station at Arandis, to a Concentrated Solar Plant. Responsibilities included project management (programme, finances and client expectations), liaison with authorities and relevant stakeholders, review of specialist reports and the compilation and review of the Amendment Report.

Franci Gresse Senior Environmental Impact Assessment Practitioner

Table Mountain Group (TMG) Aquifer feasibility study and pilot project, Western Cape Province, South Africa, City of Cape Town, 2015 - date, Environmental Consultant

The TMG Aquifer Feasibility Study and Pilot Project was initiated in 2002 and is a long term planning initiative to investigate the groundwater potential of the TMG Aquifer as a water source to augment Cape Town's water supply. Given the recommendations in the Exploratory Phase report, and the fact that the TMG Aquifer has since been utilised as a water resource in areas such as Hermanus and Oudtshoorn, the City of Cape Town decided to omit the Pilot Phase and rather proceed with an extended Exploratory Phase, which would include limited pump testing. Aurecon was appointed n to undertake the extended Exploratory Phase work. Responsibilities include the compilation of Environmental Management Plans for the additional test sites, liaison with the relevant authorities and landowners and management of the Environmental Control Officers on the project.

Implementation of the Hoekplaas environmental authorisation (EA), Northern Cape Province, South Africa, Mulilo Renewable Energy, 11/2013 - 05/2015, Project Leader

Aurecon assisted the holder of the environmental authorisation (EA) for the 100 MW photovoltaic (PV) facility in De Aar with the implementation of the environmental conditions to ensure compliance to all relevant environmental legislation. Responsible for the management of tasks and review of all documentation. Also assisting client with questions on the environmental impact assessment (EIA) process.

Environmental impact assessment and compilation of an environmental management plan (EMP) for the Swakopmund-Mile 7 Water Supply, Phase 2, Swakopmund, Namibia, NamWater, 11/2013 - 10/2015, Project Leader

NamWater appointed Aurecon to assist with the environmental impact assessment process for the proposed construction of a new bulk water pipeline between Swakopmund and Mile 7. Responsible for the management and review of the environmental impact assessment (EIA) reports and processes, as well as the project's finances.

Working for Wetlands plan 2014 - 2016, Regional South Africa, South African National Biodiversity Institute (SANBI), 06/2013 – 05/2016, Task Leader

The South African National Biodiversity Institute (SANBI) appointed Aurecon to provide environmental and engineering services for the Working for Wetlands Programme which is a national wetland rehabilitation programme. Responsible for the management of the environmental authorisation component of the project, as well as the compilation of basic assessment reports (BAR) for the country. Other responsibilities include the compilation of wetland rehabilitation plans for the Western Cape, Northern Cape, North West and Limpopo Provinces, liaison with authorities and the public (public participation process) and management of wetland specialists.

Franci Gresse Senior Environmental Impact Assessment Practitioner

Maintenance management plans (MMP's) for flood damaged road infrastructure, Western Cape Province, South Africa, Western Cape Provincial Government Department of Transport and Public Works, 06/2013 - Date, Project Staff

The project entails the compilation of maintenance management plans (MMP's) for two local municipal areas (Laingsburg and Worcester), as well as obtaining the necessary permits/ water use authorisations. Personally involved during the project commencement with regards to strategy development, meetings with the relevant authorities and assistance with the development of the MMP's.

Environmental impact assessment (EIA) for the expansion of approved solar energy facilities located near Prieska and De Aar, Northern Cape Province, South Africa, Mulilo Renewable Energy, 03/2013 - 09/2015, Phase Leader

Mulilo Renewable Energy decided to expand the approved solar energy facilities on the farms Hoekplaas and Klipgats in Prieska, as well as on the farms Badenhorst Dam and Du Plessis Dam in De Aar. The expasion of Hoekplaas farm in Prieska includes ten additional 75 MW photovoltaic (PV) facilities and six additional PV units at Klipgats Pan farm. The expansion at Badenhorst Dam farm includes four additional 75 MW PV facilities and three additional PV units at Du Plessis Dam farm. Responsible for the management and review of the environmental impact assessment (EIA) reports and processes, as well as the project's finances.

Fatal flaw study for two potential Wind Energy Facility (WEF) sites, Northern and Western Cape Provinces, South Africa, Juwi Renewable Energies (Pty) Ltd, 03/2013 - 04/2013, Environmental Practitioner

The study entailed a fatal flaw analysis of two potential wind energy facility (WEF) sites in the Northern and Western Cape Provinces. Responsible for the assessment of the sites and compilation of the fatal flaw report.

Richtersveld wind energy facility (WEF), Northern Cape Province, South Africa, TRE Tozzi Renewable Energy S.p.A and Guma Group, 07/2012 - 09/2013, Environmental Practitioner

The project entailed a due diligence of the proposed wind energy facility (WEF) to review compliance with the requirements of the Department of Energy's independent power producer (IPP) process. Responsible for the review of the environmental reports and compilation of the due diligence report.

Three photovoltaic (PV) energy facilities near Copperton, Northern Cape Province, South Africa, Mulilo Renewable Energy (MRE), 09/2011 - 05/2015, Environmental Practitioner

The project entailed three environmental impact assessments (EIA's) for three photovoltaic (PV) energy facilities comprising 75 MW to 150 MW, located near Copperton. Responsible for the management the EIA process and project specialists, compilation of scoping and EIA reports and liaison with authorities.

Fatal flaw study for four potential wind energy facility (WEF) sites, Northern and Western Cape Provinces, South Africa, Mainstream Renewable Power South Africa, 11/2011 - 05/2012, Environmental Practitioner

The study entailed a fatal flaw analysis of four potential wind energy facility (WEF) sites across the Northern and Western Cape Provinces. Responsible for the management of specialists, review of reports, assessment of the sites and compilation of the fatal flaw report.

Franci Gresse Senior Environmental Impact Assessment Practitioner

Implementation of the Klipgats Pan environmental authorisation (EA), Northern Cape Province, South Africa, Mulilo Renewable Energy, 09/2011 - 05/2015, Project Leader

Aurecon was appointed to undertake three environmental impact assessments (EIA's) for three proposed phtovoltaic (PV) solar energy plants near Copperton. The first PV solar energy plant will generate around 100 MW (preferred alternative) or 150 MW (alternative) on the Hoekplaas Farm (Farm 146/RE). The proposed PV plant will cover approximately 300 ha (preferred alternative) or 450 ha (alternative). The second includes a PV solar energy plant to generate roughly 100 MW on the farm Klipgats Pan (Farm 117/4) near Copperton in the Northern Cape. The proposed PV plant will cover an estimated 300 ha. An alternative site for a 100 MW PV plant with a 300 ha footprint is also being considered. The third comprises a PV solar energy plant to generate about 100 MW (preferred alternative) or 300 MW (alternative) on the farm Struisbult (Farm 104, portion 1) which will cover 300 ha to 900 ha. Responsible for managing tasks and reviewing all documentation for updating the environmental management plan (EMP) and implementing the environmental authorisation (EA). Also assisted client with questions on the EIA process.

Proposed rehabilitation of Wetlands as part of the Working for Wetlands, Regional, South Africa, South African National Biodiversity Institute (SANBI), 08/2011 - 09/2013, Environmental Practitioner

Appointed by the South African National Biodiversity Institute (SANBI) to conduct environmental impact assessments (EIA's) for the rehabilitation of specific wetlands in all provinces of South Africa over a five year period. Responsible for the compilation of basic assessment reports (BAR) and Wetland Rehabilitation Plans for the Western Cape, Northern Cape, Gauteng and Limpopo Provinces. Other responsibilities included liaison with authorities, public participation process, management of specialists and general project management of the environmental component of the project.

Repair of flood damage to road structures in the Eden District Municipality, Western Cape Province, South Africa, Western Cape Provincial Department of Transport and Public Works, 01/2011 - Date, Environmental Practitioner

The project entails the compilation of maintenance management plans (MMP) for seven areas with the Eden District Management Area to repair. Responsible for compilation of MMP's, review of reports and liaison with stakeholders and authorities.

Environmental impact assessment (EIA) for the proposed extension of the Ash Dam facility at Kriel power station, Mpumalanga Province, South Africa, Eskom Holdings, 11/2009 - 12/2015, Environmental Practitioner

Appointed by Eskom to conduct an environmental impact assessment (EIA) for the proposed construction of a fourth ash dam facility at the Kriel power station. Responsible for the general project management and finances, screening process, compilation of the scoping and EIA reports, public participation and the compilation of a waste management licence application.

Franci Gresse Senior Environmental Impact Assessment Practitioner

Environmental impact assessment (EIA) for proposed relocation of solar energy facility, Onder Rietvlei Farm, Aurora, Western Cape Province, South Africa, Solaire Direct Southern Africa, 2010 - 2011, Project Leader

Appointed by Solaire Direct to undertake a basic environmental impact assessment (EIA) process for the proposed relocation of an approved, but not yet constructed 10 MW solar energy facility. Responsible for the management and review of the EIA process and finances.

Environmental impact assessment (EIA) for proposed solar energy facility, Onder Rietvlei Farm, Western Cape Province, South Africa, Solaire Direct Southern Africa, 07/2010 - 02/2012, Environmental Practitioner

Appointed by Solaire Direct to undertake a basic environmental impact assessment process for the proposed construction of a 10 MW solar energy facility. Responsible for the compilation of the draft and final reports, public participation process, management of specialists and general project management.

Proposed Paarl Mountain and Ysterbrug pumping main upgrades, Western Cape Province, South Africa, Drakenstein Municipality, 06/2010 – 12/2015, Environmental Advisor

The Drakenstein Municipality appointed Aurecon's engineers to investigate and plan the proposed upgrade of the Paarl Mountain and Ysterbrug Pumping Scheme. The upgrading of the pipelines feeding the Meulwater Water Treatment Works from the Bethel and Nantes dams, also part of this scheme, was also investigated. Responsible for providing advice on environmental processes required. Other responsibilities included the management of the independent environmental assessment practitioner and the review of all environmental impact assessment (EIA) documentation.

Environmental sensitivity study (ESS) for a proposed solar energy facility on a farm Near Aurora, Western Cape Province, South Africa, Solaire Direct Southern Africa, 2010, Environmental Practitioner

Appointed to provide and environmental sensitivity study (ESS) which inter alia highlights the potential constraints ('red flags') and opportunities presented by the site from an environmental perspective. Responsible for the compilation of the ESS.

Proposed remediation, rehabilitation and restoration of the Spruit, Krom, Leeu and Palmiet Rivers, Western Cape Province, South Africa, Drakenstein Municipality, 2009 - 2010, Environmental Practitioner

Appointed by the Drakenstein Municipality to undertake the requisite environmental impact assessment (EIA) process for the rehabilitation, remediation and stabilisation of four rivers in Paarl and Wellington. Responsible for the EIA and public participation processes.

Proposed construction of a new pipeline from Bovlei Winer to Withoogte Dam, Wellington, Western Cape Province, South Africa, Drakenstein Municipality, 2009 - 2010, Environmental Practitioner

The Drakenstein Municipality proposed to replace a section of the existing pipeline extending from the Withoogte Dam to the Welvanpas Reservoir near Wellington as part of the municipality's water master plan in order to improve the overall water supply. Responsible for the compilation of the environmental impact assessment (EIA) report, management of specialists and the public participation process.

Franci Gresse Senior Environmental Impact Assessment Practitioner

Proposed erection of Eskom communication sirens and public anouncement (PA) systems, Blaauwberg, Western Cape Province, South Africa, Eskom, 2009 - 2010, Environmental Practitioner

The project entailed three environmental impact assessment (EIA) processes for the (a) erection of 10 new sirens in the Parklands area, (b) the relocation of one siren in Bloubergstrand, and (c) the upgrade of five sirens on farms near Melkbosstrand. Responsible for compiling environmental impact assessment (EIA) reports, and the public participation process.

Overberg District Municipality integrated transport plan (ITP) strategic environmental informants, Western Cape Province, South Africa, Overberg District Municipality, 2009, Environmental Practitioner

Aurecon's Transportation Unit was appointed to revise the integrated transport plan (ITP). The Environmental Unit was subcontracted to provide environmental input. Responsible for identifying and describing the relevant informants.

Annandale Commercial: development of petrol filling station on portion of Erf 5561, Kuils River, Western Cape Province, South Africa, Communicate, 2009, Environmental Practitioner

Appointed to compile a construction environmental management plan (CEMP) for the construction of a filling station on the corner of Gladioli Street and Amandel Drive, Kuils River. Responsible for the compilation of the project specification document as part of the CEMP.

Environmental impact assessment (EIA) for the proposed Langezandt Quays development in Struisbaai Harbour, Western Cape Province, South Africa, Golden Falls (Pty) Ltd, 2008 - Date, Environmental Practitioner

Aurecon was appointed to undertake an environmental impact assessment (EIA) process for the proposed development of a four storey development on Erf 848 within the Struisbaai harbour precinct. Responsible for drafting responses to the Department of Environmental Affairs' independent review report on the proposed development.

Pre-feasibility and feasibility studies for augmenting the Western Cape water supply system, South Africa, Department of Water Affairs (DWA), 2008 - 2013, Project Staff

The Department of Water Affairs commissioned pre-feasibility and feasibility studies for the augmentation of the Western Cape water supply system through the further development of the surface water resources. Surface water schemes to be investigated were identified by the Western Cape water supply system reconciliation strategy study. Responsible for the public participation process, managing environmental specialists, and compiling a socio-economic overview of the study area.

Proposed redevelopment of the Blaauwberg Conservation Area: Eerstesteen Node, Western Cape Province, South Africa, City of Cape Town, 2008 - 2010, Environmental Practitioner

The project entailed an environmental impact assessment (EIA) process for redeveloping the Eerstesteen Conservation Area on the West Coast. Responsible for compiling the EIA report, as well as managing specialists and the public participation process.

Franci Gresse Senior Environmental Impact Assessment Practitioner

Table Mountain Group aquifer feasibility study and pilot project, Western Cape Province, South Africa, City of Cape Town, 2008 - 2010, Environmental Control Officer

The City of Cape Town initiated a study into the Table Mountain Group Aquifer as a potential water source to augment the city's supply. The feasibility and pilot project phase record of decision (RoD) required completion for site-specific environmental management plans (EMP's) for drilling sites that were assessed to be environmentally sensitive. Site-specific EMP's were designed for sensitive sites to ensure minimal environmental impact during the drilling phase. Responsible for monitoring compliance with the RoD and EMP during the drilling phase.

Water reconciliation strategy for the Algoa water supply area, Eastern Cape Province, South Africa, 2008 - 2009, Environmental Practitioner

This project provided an assessment of the environmental opportunities and constraints for a suite of water schemes in the Algoa water supply area. This was undertaken as part of a broader study in the area.

Application for rectification in terms of Section 24G of the National Environmental Management Act (NEMA) for the unlawful commencement of a fruit processing factory on Op de Tradouw Farm, Number 69, Barrydale, Western Cape Province, South Africa, Schoonies Family Trust, 2008 - 2009, Environmental Practitioner

The project consisted of an application for rectification in terms of Section 24G of NEMA. Responsible for compiling an environmental impact report and an environmental management plan (EMP) for the application, as well as managing the public participation process.

Proposed development of apple and pear orchards on Soetmelksvlei Farm, Western Cape Province, South Africa, BETCO, 2008 - 2009, Project Staff

This Agri-development project involved the development of 50 ha of apple and pear orchards in the Riviersonderend region. Responsible for compiling the basic assessment report, environmental management plan (EMP), and managing the specialists and public participation process.

C.A.P.E. Olifants-Doring Catchment Management Agency project: Development of a catchment management strategy water resource protection sub-strategy for the Olifants-Doring Catchment, South Africa, CapeNature, 2008 - 2009, Environmental Practitioner

Appointed by CapeNature to compile a catchment management strategy water resource protection sub-strategy for the Olifants-Doorn catchment. Responsible for compiling a database that lists all institutions and their respective mandates in terms of water resource protection and biodiversity conservation decision making for the Olifants-Doring Catchment, workshop arrangements, and general project related work.

Environmental sensitivity study for the proposed Dasdrif poultry farm in Moorreesburg, Western Cape Province, South Africa, Eikenhoff Poultry Farms (Pty) Ltd, 2008, Project Staff

The project consisted of an environmental sensitivity study (ESS) which, inter alia, highlighted the potential constraints ('red flags') and opportunities presented by the site from an environmental perspective. Responsible for compiling the ESS.

Qualifications

MSc Geography

BSc (Geography and Environmental Management)

BSc Geography (Hons)

Environmental Assessment Practitioner, Interim Certification Board of Environmental Assessment Practitioners of South Africa

Candidate Natural Scientist, South African Council for Natural Scientific Professions (SACNASP)

Member, International Association for Impact Assessment (IAIAsa), South Africa

Member, Institute of Waste Management of Southern Africa (IWMSA)

Specialisation

Environmental Specialist

Years in industry

7

Languages

Afrikaans

English

Margaret Lowies

Senior Environmental Scientist

Margaret is a senior environmental scientist currently based in Aurecon's Port Elizabeth office. She has over seven years of experience in environmental impact assessment (EIA) processes, water use licence applications, waste licence applications, environmental compliance auditing, mining permit applications, wetland assessments, due diligence assessments and water quality assessments. Most of these projects have been focussed at a municipal level within the various municipalities of the Eastern Cape, and her roles include both the technical work and overall project management. Her role as an environmental control officer (ECO) has also given her a very practical understanding of how projects of various scales are implemented.

She obtained a BSc degree in Geography and Environmental Management, a BSc in Geography (Hons) as well as an MSc degree in Geography from the University of Johannesburg, South Africa in 2008, 2010 and 2014 respectively. She is registered as an environmental assessment practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPSA) and is a registered candidate natural scientist with the South African Council for Natural Scientific Professions (SACNASP). She is also member of the Institute of Waste Management of South Africa (IWMSA) and the South African affiliate of the International Association of Impact Assessment (IAIAsa).

Experience

Training & Capacity Building

Working for Wetlands ECO training, South Africa,

Having worked on the planning cycles of the Working for Wetlands Programme for many years, Margaret provided training on the importance of implementing the appropriate mitigation measures during wetland rehabilitation. This was guided by her experience as an Environmental Control Officer.

Environmental Control Officer

Construction of Zone 7 municipal infrastructure to service the TNPA Tank Farm, Eastern Cape Province, South Africa, Coega Development Corporation (CDC), 10/2007 - 12/2025, Environmental Control Officer

The project involved the construction of roads, a stormwater detention pond and the installation of various services. Responsible for ensuring compliance with environmental assessment and CDC standard environmental specifications.

Dordrecht water and sanitation services upgrade, Eastern Cape Province, South Africa, Chris Hani District Municipality, 10/2015 - 12/2017, Environmental Control Officer

This project is divided into four future projects, which includes the construction of new sewage treatment facilities; the construction of new reticulation in Dordrecht; immediate water supply upgrades and long-term bulk water supply upgrades. Responsible for report review.

Northern outfall sewers, Mthatha, Eastern Cape Province, South Africa, Amatola Water - Amanzi, 06/2013 - 12/2017, Environmental Control Officer

The project entailed consulting engineering, social facilitation and environmental services for the construction of the outfall sewers along the banks of the Mthatha River. This involved the installation of 1 200 mm diameter sewer pipes, crossing the river above ground and below the river bed level. The sewage will discharge into a 17 m-deep pump station, from where it will be pumped into the head of the existing wastewater treatment works (WWTW).The project also entailed the application for a water use licence application (WULA). Responsible for management of environmental site officer, report writing and WULA report/application review.

Construction of Graaff-Reinet solid waste site, Eastern Cape Province, South Africa, Camdeboo Local Municipality, 12/2010 - 12/2016, Environmental Control Officer

The project comprised the construction of a new solid waste site outside Graaff-Reinet. Responsible for monitoring compliance with the environmental management plan (EMP) and record of decision (ROD).

Construction environmental management plan (EMP) for Ugie particle board plant, Eastern Cape Province, South Africa, PG Bison, 08/2006 - 08/2016, Environmental Control Officer

The project entailed a construction environmental management plan (EMP), operation environmental management plan (OEMP), atmospheric emissions license (AEL) reviews and ongoing monitoring for the Ugie particle board plant. Responsible for operational compliance auditing.

Sidwadweni Bulk Regional Water Supply Scheme, Eastern Cape Province, South Africa, Amatola Water - Amanzi, 09/2012 - 07/2016, Environmental Control Officer

The project included the construction of river abstraction, raw water reservoir, water treatment works (WTW), clear water pump station and bulk supply mains for the Sidwadweni Bulk Regional Water Supply Scheme. Responsible for report review.

Idutywa East Water Supply Scheme (WSS), Eastern Cape Province, South Africa, Amathole District Municipality (ADM), 05/2006 - 12/2015, Environmental Control Officer

Aurecon undertook the design and construction of the Idutywa East Water Supply Scheme (WSS) in the Eastern Cape Province. Responsible for ensuring environmental compliance and report review.

Khayamnandi housing development project, Eastern Cape Province, South Africa, Nelson Mandela Bay Metropolitan Municipality (NMBMM), 02/2011 - 01/2015, Environmental Control Officer

The project entailed environmental services for the development of Khayamnandi extension on erven 114, 609, 590 and 24337, Bethelsdorp, including the construction of 7 960 residential stands, business stands and community facilities and supporting infrastructure. Responsible for overall environmental monitoring and inputs as well as compilation/review of monthly audit reports.

Cookhouse Wind Farm project, Eastern Cape Province, African Clean Energy Developments (ACED), 12/2012 - 12/2014, Environmental Control Officer

Aurecon was appointed as owner's engineer for the construction of a 140 MW wind farm in the Eastern Cape Province of South Africa. The scope of services included design review, site supervision, environmental monitoring, health and safety monitoring and witnessing of commissioning and testing. The Cookhouse Wind Farm Stage 1 comprise 66 x Suzlon S88 2.1 MW wind turbines, associated roads and foundations, electrical reticulation, substation, supervisory control and data acquisitioning (SCADA) system as well as a 132 kV overhead line (OHL) to the Poseidon substation. The scope of owner's engineer services has been structured to align with the role and obligations of the owner's engineer defined in the draft engineering, procurement and construction (EPC) agreement for the project. Responsible for overseeing environmental compliance of the project including updating of the environmental management plan (EMP), approval of method statements, environmental authorisation and layout amendments, bi-weekly audits with a monthly environmental assessment (EA) and EMP compliance report.

Advisory

Reconciliation strategy for Algoa Water Supply System (WSS), Eastern Cape Province, South Africa, Department of Water and Sanitation, 04/2016 - 03/2019, Environmental Specialist - Advisory

The project objectives are to put arrangements and resources in place for the ongoing implementation of the recommendations and maintenance of the Algoa Reconciliation Strategy; to evaluate the efficiency of the Orange-Fish-River Project and to remove potential operating system constraints for the sustainable delivery of the Orange River bulk water supply to the Lower Sundays River Government Water Scheme (LSRGWS) and to Nelson Mandela Bay Municipality (NMBM) for water requirements up to 2040. In order to evaluate the efficiency of the Orange River Project Aurecon will estimate water use efficiency; determine catchment yields of the Fish and Sundays catchments; give recommendations for the phasing-out of current gratis allocations; identify potential water savings and provide options for re-allocation as well as confirm an official allocation from the Teebus Tunnel to the Orange-Fish System (OFS) in the Eastern Cape. While the focus is on providing additional balancing storage in addition to the Scheepersvlakte Balancing Dam, the provision of storage at other potential locations in the bulk transfer infrastructure must also be considered. Responsible for ad hoc advisory relating to environmental legislation compliance and general environmental matters.

Public Servant Association Social and Labour Plan (SLP), Eastern Cape Province, South Africa, Public Servant Association, 12/2010 - 02/2011, Environmental Assessment Practitioner

The Social and Labour Plan (SLP) was done in order to obtain a mining right conversion for the Department of Mineral Resources (DMR) for the Gonubie Sand Mine. Responsible for compilation of SLP and communication with DMR.

Margaret Lowies Senior Environmental Scientist

Integrated Environmental Permitting (EIAs, EMPs and MMPs)

Working for Wetlands Programme, Department of Environmental Affairs, 06/2011 - 04/2018, Environmental Assessment Practitioner - Coordinator of the Mpumalanga and Eastern Cape Provincial teams

Aurecon was appointed in 2011, 2013 and then again in 2016 for a three-year cycle for the design, planning, environmental, project and risk management of the Working for Wetlands programme. The programme's objective is to rehabilitate damaged wetlands throughout South Africa, with an emphasis on complying with the principles of the Expanded Public Works Programme (EPWP) through employing only local small, medium and micro enterprises (SMMEs). Involvement included site work, a rehabilitation plan and basic assessment report to enable the rehabilitation of various wetlands within the Mpumalanga and Eastern Cape provinces. Responsible for coordination of provincial team (wetland specialist, engineer and DEA Assistant Director) and report writing.

Motherwell North Bulk Sewer, Eastern Cape Province, South Africa, Nelson Mandela Bay Metropolitan Municipality (NMBMM), 12/2015 - 10/2017, Project Leader/Environmental Assessment Practitioner

Aurecon was appointed to undertake environmental authorisations for the Motherwell North Bulk Sewer project. This included environmental impact assessment (EIA), heritage, water use licenses (WUL) and specialist studies for the 1.5 m diameter collector sewer of 10 km. Responsible for project management and review of report.

Misgund augmentation bulk water supply, Eastern Cape Province, South Africa, Amatola Water - Amanzi, 01/2014 - 06/2017, Environmental Assessment Practitioner/Specialist

The project entailed a study to determine the technical feasibility of bulk water supply in Misgund as per the Department of Water Affairs (DWA) guidelines for Regional Bulk Infrastructure Grant (RBIG) projects. Responsible for environmental impact assessment (EIA) process, water use licence application (WULA) and wetland assessment.

Upgrading and permitting of the Klipplaat landfill site, Eastern Cape Province, South Africa, Ikwezi Local Municipality, 10/2011 - 06/2016, Environmental Assessment Practitioner

The project involved the upgrading and permitting of the existing Klipplaat landfill site. This includes a scoping-environmental impact assessment (EIA) process as well as waste licence application process. Responsible for managing the EIA process, including public participation and report writing and review.

Bende water supply scheme, Eastern Cape Province, South Africa, Amathole District Municipality, 05/2014 - 02/2015, Environmental Assessment Practitioner

Aurecon was appointed for the environmental management for the proposed implementation of two rural water supply schemes at Bende and Shixini in the Eastern Cape Province. Responsible for report review, appointment of specialists and management of environmental impact assessment (EIA) process.

Upgrading of National Route 61 Section 6 (R61/6) from All Saints (Km 68.5) to Section 7 - Baziya (Km 12), between Baziya and Queenstown, Eastern Cape Province, South Africa, South African National Roads Agency Limited

(SANRAL), 04/2012 - 12/2014, Environmental Assessment Practitioner/Environmental Specialist

Aurecon was appointed by Jeffares & Green (J&G), on behalf of the South African National Roads Agency Limited (SANRAL), to undertake an all environmental authorisation and public participation process (PPP) for the proposed road upgrade of National Route R61. The project involved the upgrading of a 36 km stretch of road as well as replacing five bridges. Responsible for project management, report writing and water quality specialist report.

Social impact assessment (SIA) for augmentation of the Driftsands collector sewer, Eastern Cape Province, South Africa, Nelson Mandela Bay Metropolitan Municipality (NMBMM), 08/2011 - 10/2011, Environmental Assessment Practitioner

The project involved a survey of households in the Walmer Township that are impacted by the augmentation of the Driftsands sewer collector. Responsible for coordination of survey, capturing of data and report writing.

Other Environmental Permitting/ Management Projects

- Churchill water treatment works (WTW), Eastern Cape Province, 03/2007 – 12/2020, Environmental Assessment Practitioner
- Upgrade of Brickfields pre-treatment works in Nelson Mandela Bay Metropolitan Municipality, 12/2010 – 07/2020, Environmental Assessment Practitioner
- Sewer maintenance backlog study for the Nelson Mandela Bay Metropolitan Municipality, Eastern Cape Province, South Africa, Nelson Mandela Bay Metropolitan Municipality (NMBMM), 10/2004 - 07/2020, Environmental Assessment Practitioner
- Environmental impact assessment for pipe upgrade of Eastbury Drive Sewer, KwaZulu-Natal Province, South Africa, eThekwini Municipality, 06/2016 - 05/2019, Environmental Assessment Practitioner
- Environmental services for upgrading of R75, Eastern Cape Province, South Africa, South African National Roads Agency Limited (SANRAL), 02/2015 - 02/2018, Project Leader/Environmental Assessment Practitioner
- Woodchem water use licence, Mpumalanga Province, South Africa, KAP Diversified Industrial (Pty) Ltd, 04/2016 - 07/2017, Environmental Specialist
- Environmental impact assessment (EIA) for Coega wastewater treatment works (WWTW), Eastern Cape Province, South Africa, Nelson Mandela Bay Metropolitan Municipality (NMBMM), 12/2014 - 05/2017, Project Leader/Environmental Assessment Practitioner
- Water use licence application (WULA) and wetland assessment for Grassridge to Melkhout 132 kV line, Eastern Cape Province, South Africa, Eskom SOC Ltd, 11/2014 - 12/2015, Environmental Specialist/Project Leader
- Proposed construction of the Ingquza Hill Museum - basic assessment, Eastern Cape Province, South Africa, National Department of Arts and Culture, 08/2013 - 10/2013, Environmental Assessment Practitioner

Appendix E

ADDITIONAL INFORMATION

Appendix E1

EAP DECLARATION AND EXPERTISE

Franci Gresse

Programme Manager

Qualifications

BSc (Hons) Conservation Ecology

Member, International Association of Impact Assessment South Africa (IAIAsa)

Specialisation

Environmental Impact Assessment Practitioner

Years in industry

10,08

Franci is a senior environmental practitioner in Aurecon's Cape Town office. She has been involved in various environmental investigations, including environmental impact assessments (EIA's), environmental management plans (EMP's), environmental management programmes (EMP's), rehabilitation plans maintenance management plans (MMP's) and fatal flaw analysis.

Franci has been involved with the Working for Wetlands rehabilitation programme for the past five years, of which she has been acting as the Team Leader for the environmental assessment practitioners (EAP's) for the last three years. The Working for Wetlands project won the 2012 Aurecon Chairman's Award for its positive contribution to the natural and social environmental. In addition, Franci has also been involved with a number of projects in the renewable energy sector.

Franci served on the committee of the South African affiliate of the International Association for Impact Assessment (IAIA) for the Western Cape Branch from 2009 to 2011, and remains a member. She completed a Bachelor of Science and an Honours Degree in Conservation Ecology at the University of Stellenbosch (South Africa).

Experience

Implementation of the Hoekplaas environmental authorisation (EA), Northern Cape Province, South Africa, Mulilo Renewable Energy, 11/2013 - 05/2015, Project Leader

Aurecon assisted the holder of the environmental authorisation (EA) for the 100 MW photovoltaic (PV) facility in De Aar with the implementation of the environmental conditions to ensure compliance to all relevant environmental legislation. Responsible for the management of tasks and review of all documentation. Also assisting client with questions on the environmental impact assessment (EIA) process.

Environmental impact assessment and compilation of an environmental management plan (EMP) for the Swakopmund-Mile 7 Water Supply, Phase 2, Swakopmund, Namibia, NamWater, 11/2013 - 10/2015, Project Leader

NamWater appointed Aurecon to assist with the environmental impact assessment process for the proposed construction of a new bulk water pipeline between Swakopmund and Mile 7. Responsible for the management and review of the environmental impact assessment (EIA) reports and processes, as well as the project's finances.

Working for Wetlands plan 2014 - 2017, Regional South Africa, South African National Biodiversity Institute (SANBI), 06/2013 - Date, Task Leader

The South African National Biodiversity Institute (SANBI) appointed Aurecon to provide environmental and engineering services for the Working for Wetlands Programme which is a national wetland rehabilitation programme. Responsible for the management of the environmental authorisation component of the project,

as well as the compilation of basic assessment reports (BAR) for the country. Other responsibilities include the compilation of wetland rehabilitation plans for the Western Cape, Northern Cape, North West and Limpopo Provinces, liaison with authorities and the public (public participation process) and management of wetland specialists.

Maintenance management plans (MMP's) for flood damaged road infrastructure, Western Cape Province, South Africa, Western Cape Provincial Government Department of Transport and Public Works, 06/2013 - Date, Project Staff

The project entails the compilation of maintenance management plans (MMP's) for two local municipal areas (Laingsburg and Worcester), as well as obtaining the necessary permits/ water use authorisations. Personally involved during the project commencement with regards to strategy development, meetings with the relevant authorities and assistance with the development of the MMP's.

Environmental impact assessment (EIA) for the expansion of approved solar energy facilities located near Prieska and De Aar, Northern Cape Province, South Africa, Mulilo Renewable Energy, 03/2013 - 09/2015, Phase Leader

Mulilo Renewable Energy decided to expand the approved solar energy facilities on the farms Hoekplaas and Klipgats in Prieska, as well as on the farms Badenhorst Dam and Du Plessis Dam in De Aar. The expasion of Hoekplaas farm in Prieska includes ten additional 75 MW photovoltaic (PV) facilities and six additional PV units at Klipgats Pan farm. The expansion at Badenhorst Dam farm includes four additional 75 MW PV facilities and three additional PV units at Du Plessis Dam farm. Responsible for the management and review of the environmental impact assessment (EIA) reports and processes, as well as the project's finances.

Fatal flaw study for two potential Wind Energy Facility (WEF) sites, Northern and Western Cape Provinces, South Africa, Juwi Renewable Energies (Pty) Ltd, 03/2013 - 04/2013, Environmental Practitioner

The study entailed a fatal flaw analysis of two potential wind energy facility (WEF) sites in the Northern and Western Cape Provinces. Responsible for the assessment of the sites and compilation of the fatal flaw report.

Richtersveld wind energy facility (WEF), Northern Cape Province, South Africa, TRE Tozzi Renewable Energy S.p.A and Guma Group, 07/2012 - 09/2013, Environmental Practitioner

The project entailed a due diligence of the proposed wind energy facility (WEF) to review compliance with the requirements of the Department of Energy's independent power producer (IPP) process. Responsible for the review of the environmental reports and compilation of the due diligence report.

Three photovoltaic (PV) energy facilities near Copperton, Northern Cape Province, South Africa, Mulilo Renewable Energy (MRE), 09/2011 - 05/2015, Environmental Practitioner

The project entailed three environmental impact assessments (EIA's) for three photovoltaic (PV) energy facilities comprising 75 MW to 150 MW, located near Copperton. Responsible for the management the EIA process and project specialists, compilation of scoping and EIA reports and liaison with authorities.

Fatal flaw study for four potential wind energy facility (WEF) sites, Northern and Western Cape Provinces, South Africa, Mainstream Renewable Power South Africa, 11/2011 - 05/2012, Environmental Practitioner

The study entailed a fatal flaw analysis of four potential wind energy facility (WEF) sites across the Northern and Western Cape Provinces. Responsible for the management of specialists, review of reports, assessment of the sites and compilation of the fatal flaw report.

Implementation of the Klipgats Pan environmental authorisation (EA), Northern Cape Province, South Africa, Mulilo Renewable Energy, 09/2011 - 05/2015, Project Leader

Aurecon was appointed to undertake three environmental impact assessments (EIA's) for three proposed phtovoltaic (PV) solar energy plants near Copperton. The first PV solar energy plant will generate around 100 MW (preferred alternative) or 150 MW (alternative) on the Hoekplaas Farm (Farm 146/RE). The proposed PV plant will cover approximately 300 ha (preferred alternative) or 450 ha (alternative). The second includes a PV solar energy plant to generate roughly 100 MW on the farm Klipgats Pan (Farm 117/4) near Copperton in the Northern Cape. The proposed PV plant will cover an estimated 300 ha. An alternative site for a 100 MW PV plant with a 300 ha footprint is also being considered. The third comprises a PV solar energy plant to generate about 100 MW (preferred alternative) or 300 MW (alternative) on the farm Struisbult (Farm 104, portion 1) which will cover 300 ha to 900 ha. Responsible for managing tasks and reviewing all documentation for updating the environmental management plan (EMP) and implementing the environmental authorisation (EA). Also assisted client with questions on the EIA process.

Proposed rehabilitation of Wetlands as part of the Working for Wetlands, Regional, South Africa, South African National Biodiversity Institute (SANBI), 08/2011 - 09/2013, Environmental Practitioner

Appointed by the South African National Biodiversity Institute (SANBI) to conduct environmental impact assessments (EIA's) for the rehabilitation of specific wetlands in all provinces of South Africa over a five year period. Responsible for the compilation of basic assessment reports (BAR) and Wetland Rehabilitation Plans for the Western Cape, Northern Cape, Gauteng and Limpopo Provinces. Other responsibilities included liaison with authorities, public participation process, management of specialists and general project management of the environmental component of the project.

Repair of flood damage to road structures in the Eden District Municipality, Western Cape Province, South Africa, Western Cape Provincial Department of Transport and Public Works, 01/2011 - Date, Environmental Practitioner

The project entails the compilation of maintenance management plans (MMP) for seven areas with the Eden District Management Area to repair. Responsible for compilation of MMP's, review of reports and liaison with stakeholders and authorities.

Environmental impact assessment (EIA) for the proposed extension of the Ash Dam facility at Kriel power station, Mpumalanga Province, South Africa, Eskom Holdings, 11/2009 - 12/2015, Environmental Practitioner

Appointed by Eskom to conduct an environmental impact assessment (EIA) for the proposed construction of a fourth ash dam facility at the Kriel power station. Responsible for the general project management and finances, screening process, compilation of the scoping and EIA reports, public participation and the compilation of a waste management licence application.

Environmental impact assessment (EIA) for proposed relocation of solar energy facility, Onder Rietvlei Farm, Aurora, Western Cape Province, South Africa, Solaire Direct Southern Africa, 2010 - 2011, Project Leader

Appointed by Solaire Direct to undertake a basic environmental impact assessment (EIA) process for the proposed relocation of an approved, but not yet constructed 10 MW solar energy facility. Responsible for the management and review of the EIA process and finances.

Environmental impact assessment (EIA) for proposed solar energy facility, Onder Rietvlei Farm, Western Cape Province, South Africa, Solaire Direct Southern Africa, 07/2010 - 02/2012, Environmental Practitioner

Appointed by Solaire Direct to undertake a basic environmental impact assessment process for the proposed construction of a 10 MW solar energy facility. Responsible for the compilation of the draft and final reports, public participation process, management of specialists and general project management.

Proposed Paarl Mountain and Ysterbrug pumping main upgrades, Western Cape Province, South Africa, Drakenstein Municipality, 06/2010 - Date, Environmental Advisor

The Drakenstein Municipality appointed Aurecon's engineers to investigate and plan the proposed upgrade of the Paarl Mountain and Ysterbrug Pumping Scheme. The upgrading of the pipelines feeding the Meulwater Water Treatment Works from the Bethel and Nantes dams, also part of this scheme, was also investigated. Responsible for providing advice on environmental processes required. Other responsibilities included the management of the independent environmental assessment practitioner and the review of all environmental impact assessment (EIA) documentation.

Environmental sensitivity study (ESS) for a proposed solar energy facility on a farm Near Aurora, Western Cape Province, South Africa, Solaire Direct Southern Africa, 2010, Environmental Practitioner

Appointed to provide and environmental sensitivity study (ESS) which inter alia highlights the potential constraints ('red flags') and opportunities presented by the site from an environmental perspective. Responsible for the compilation of the ESS.

Proposed erection of Eskom communication sirens and public anouncement (PA) systems, Blaauwberg, Western Cape Province, South Africa, Eskom, 2009 - 2010, Environmental Practitioner

The project entailed three environmental impact assessment (EIA) processes for the (a) erection of 10 new sirens in the Parklands area, (b) the relocation of one siren in Bloubergstrand, and (c) the upgrade of five sirens on farms near Melkbosstrand. Responsible for compiling environmental impact assessment (EIA) reports, and the public participation process.

Proposed remediation, rehabilitation and restoration of the Spruit, Krom, Leeu and Palmiet Rivers, Western Cape Province, South Africa, Drakenstein Municipality, 2009 - 2010, Environmental Practitioner

Appointed by the Drakenstein Municipality to undertake the requisite environmental impact assessment (EIA) process for the rehabilitation, remediation and stabilisation of four rivers in Paarl and Wellington. Responsible for the EIA and public participation processes.

Proposed construction of a new pipeline from Bovlei Winer to Withoogte Dam, Wellington, Western Cape Province, South Africa, Drakenstein Municipality, 2009 - 2010, Environmental Practitioner

The Drakenstein Municipality proposed to replace a section of the existing pipeline extending from the Withoogte Dam to the Welvanpas Reservoir near Wellington as part of the municipality's water master plan in order to improve the overall water supply. Responsible for the compilation of the environmental impact assessment (EIA) report, management of specialists and the public participation process.

Overberg District Municipality integrated transport plan (ITP) strategic environmental informants, Western Cape Province, South Africa, Overberg District Municipality, 2009, Environmental Practitioner

Aurecon's Transportation Unit was appointed to revise the integrated transport plan (ITP). The Environmental Unit was subcontracted to provide environmental input. Responsible for identifying and describing the relevant informants.

Annandale Commercial: development of petrol filling station on portion of Erf 5561, Kuils River, Western Cape Province, South Africa, Communicate, 2009, Environmental Practitioner

Appointed to compile a construction environmental management plan (CEMP) for the construction of a filling station on the corner of Gladioli Street and Amandel Drive, Kuils River. Responsible for the compilation of the project specification document as part of the CEMP.

Overberg District Municipality integrated transport plan (ITP): strategic environmental informants, Western Cape Province, South Africa, Overberg District Municipality, 2009, Environmental Practitioner

Aurecon's Transportation Unit was appointed to revise the integrated transport plan (ITP). The Environmental Unit was subcontracted to provide environmental input. Responsible for identifying and describing the relevant informants.

Environmental impact assessment (EIA) for the proposed Langezandt Quays development in Struisbaai Harbour, Western Cape Province, South Africa, Golden Falls (Pty) Ltd, 2008 - Date, Environmental Practitioner

Aurecon was appointed to undertake an environmental impact assessment (EIA) process for the proposed development of a four storey development on Erf 848 within the Struisbaai harbour precinct. Responsible for drafting responses to the Department of Environmental Affairs' independent review report on the proposed development.

Pre-feasibility and feasibility studies for augmenting the Western Cape water supply system, South Africa, Department of Water Affairs (DWA), 2008 - 2013, Project Staff

The Department of Water Affairs commissioned pre-feasibility and feasibility studies for the augmentation of the Western Cape water supply system through the further development of the surface water resources. Surface water schemes to be investigated were identified by the Western Cape water supply system reconciliation strategy study. Responsible for the public participation process, managing environmental specialists, and compiling a socio-economic overview of the study area.

Proposed redevelopment of the Blaauwberg Conservation Area: Eerstesteen Node, Western Cape Province, South Africa, City of Cape Town, 2008 - 2010, Environmental Practitioner

The project entailed an environmental impact assessment (EIA) process for redeveloping the Eerstesteen Conservation Area on the West Coast. Responsible for compiling the EIA report, as well as managing specialists and the public participation process.

Table Mountain Group aquifer feasibility study and pilot project, Western Cape Province, South Africa, City of Cape Town, 2008 - 2010, Environmental Control Officer

The City of Cape Town initiated a study into the Table Mountain Group Aquifer as a potential water source to augment the city's supply. The feasibility and pilot project phase record of decision (RoD) required completion for site-specific environmental management plans (EMP's) for drilling sites that were assessed to be environmentally sensitive. Site-specific EMP's were designed for sensitive sites to ensure minimal environmental impact during the drilling phase. Responsible for monitoring compliance with the RoD and EMP during the drilling phase.

Application for rectification in terms of Section 24G of the National Environmental Management Act (NEMA) for the unlawful commencement of a fruit processing factory on Op de Tradouw Farm, Number 69, Barrydale, Western Cape Province, South Africa, Schoonies Family Trust, 2008 - 2009, Environmental Practitioner

The project consisted of an application for rectification in terms of Section 24G of NEMA. Responsible for compiling an environmental impact report and an environmental management plan (EMP) for the application, as well as managing the public participation process.

Proposed development of apple and pear orchards on Soetmelksvlei Farm, Western Cape Province, South Africa, BETCO, 2008 - 2009, Project Staff

This Agri-development project involved the development of 50 ha of apple and pear orchards in the Riviersonderend region. Responsible for compiling the basic assessment report, environmental management plan (EMP), and managing the specialists and public participation process.

Proposed extension of Lock Road, Kalk Bay, Western Cape Province, South Africa, Mr Rick Bartlett, 2008 - 2009, Project Staff

The project comprised an environmental impact assessment (EIA) process for extending Lock Road to an existing erf. Involved during the final stages of the application.

Water reconciliation strategy for the Algoa water supply area, Eastern Cape Province, South Africa, 2008 - 2009, Environmental Practitioner

This project provided an assessment of the environmental opportunities and constraints for a suite of water schemes in the Algoa water supply area. This was undertaken as part of a broader study in the area.

C.A.P.E. Olifants-Doring Catchment Management Agency project: Development of a catchment management strategy water resource protection sub-strategy for the Olifants-Doring Catchment, South Africa, CapeNature, 2008 - 2009, Environmental Practitioner

Appointed by CapeNature to compile a catchment management strategy water resource protection sub-strategy for the Olifants-Doorn catchment. Responsible for compiling a database that lists all institutions and their respective mandates in terms of water resource protection and biodiversity conservation decision making for the Olifants-Doring Catchment, workshop arrangements, and general project related work.

Environmental sensitivity study for the proposed Dasdrif poultry farm in Moorreesburg, Western Cape Province, South Africa, Eikenhoff Poultry Farms (Pty) Ltd, 2008, Project Staff

The project consisted of an environmental sensitivity study (ESS) which, inter alia, highlighted the potential constraints ('red flags') and opportunities presented by the site from an environmental perspective. Responsible for compiling the ESS.

Joint Maputo River Basin water resources study, Mozambique, Swaziland and South Africa, 2008, Project Staff

The project provided an environmental opportunities and constraints assessment of a suite of potential dams in South Africa and Swaziland, within the Maputo River Catchment. This was undertaken as part of a broader study into the catchment.

Department of Economic Affairs, Environment and Tourism (DEAET) decision-making support, South Africa, Department of Economic Affairs, Environment and Tourism (DEAET), 2008, Project Staff

Responsible for assisting the DEAET with the review and processing of environmental impact assessment (EIA) applications in terms of the Environment Conservation Act.

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

Working for Wetlands Programme: Limpopo

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

Disclosure of Vested Interest

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

Signature of the Environmental Assessment Practitioner

AURECON SA (PTY) LTD
Name of Company:

13/8/2019
Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, FRANCI GRESSE, ~~swear under oath~~ / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Environmental Assessment Practitioner

AURECON SA (PTY) LTD
Name of Company

13/8/2019
Date

Signature of the Commissioner of Oaths

13/8/2019
Date

COMMISSIONER OF OATHS
MARIA WILHELMINA OOSTHUIZEN
REF 9/1/8/2 CAPE TOWN (19 MARCH 2008)
1 CENTURY CITY DRIVE, WATERFORD
PRECINCT, CENTURY CITY 7441, RSA
Date: 13/8/2019

Appendix E2

SPECIALIST DECLARATION AND EXPERTISE

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

	(For official use only)
File Reference Number:	12/12/20/ or 12/9/11/L
NEAS Reference Number:	DEA/EIA
Date Received:	

Application for integrated environmental authorisation and waste management licence in terms of the-

(1) National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014; and

(2) National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 921, 2013

PROJECT TITLE

Working for Wetlands Rehabilitation Programme: Limpopo Province

Specialist:	Anton Linström		
Contact person:	Anton Linström		
Postal address:	P O Box 4442, Lydenburg,		
Postal code:	1120	Cell:	083 226 1089
Telephone:	NA	Fax:	NA
E-mail:	wetearth@telkomsa.net		
Professional affiliation(s) (if any)	Pr Sc Nat 400275/11		

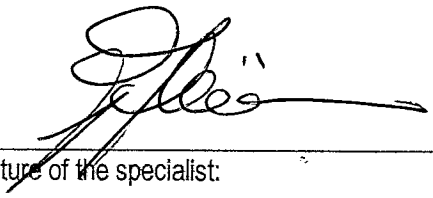
Project Consultant:	Aurecon South Africa Pty (Ltd)		
Contact person:	Claire Blanché		
Postal address:	PO Box 494		
Postal code:	8000	Cell:	082 445 5438
Telephone:	021 526 6937	Fax:	021 526 9500
E-mail:	Claire.Blanche@aurecongroup.com		

4.2 The specialist appointed in terms of the Regulations_

I, Anton Linström , declare that --

General declaration:

I act as the independent specialist in this application;
I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
I declare that there are no circumstances that may compromise my objectivity in performing such work;
I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
I will comply with the Act, Regulations and all other applicable legislation;
I have no, and will not engage in, conflicting interests in the undertaking of the activity;
I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
all the particulars furnished by me in this form are true and correct; and
I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the specialist:

Wet Earth Eco Specs (Pty) Ltd
Name of company (if applicable):

17 January 2019
Date:

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

	(For official use only)
File Reference Number:	12/12/20/ or 12/9/11/L
NEAS Reference Number:	DEA/EIA
Date Received:	

Application for integrated environmental authorisation and waste management licence in terms of the-

(1) National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014; and

(2) National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 921, 2013

PROJECT TITLE

HIA for the Proposed Anti-Erosion Measures at the Baleni Salt Works Provincial Heritage Site, Limpopo Province

Specialist:	G&A Heritage Properties (Pty) Ltd		
Contact person:	Stephan Gaigher		
Postal address:	38 A Vorster Street, Louis Trichardt		
Postal code:	0920	Cell:	073 752 6583
Telephone:	015 516 1561	Fax:	086 218 0473
E-mail:	stehan@gaheritage.co.za		
Professional affiliation(s) (if any)	ASAPA		

Project Consultant:			
Contact person:			
Postal address:			
Postal code:		Cell:	
Telephone:		Fax:	
E-mail:			

4.2 The specialist appointed in terms of the Regulations_

I, Stephan Gaigher , declare that --

General declaration:

I act as the independent specialist in this application;
I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
I declare that there are no circumstances that may compromise my objectivity in performing such work;
I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
I will comply with the Act, Regulations and all other applicable legislation;
I have no, and will not engage in, conflicting interests in the undertaking of the activity;
I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
all the particulars furnished by me in this form are true and correct; and
I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist:

G&A Heritage Properties (Pty) Ltd.

Name of company (if applicable):

2019/02/05

Date:

Appendix E3

WETLAND FORUM MEETING MINUTES

MINUTES OF THE LWF MEETING
Venue: Mopani DISTRICT Municipality, Giyani
Date :20 May 2016
Time: 09H00

1. **Opening and welcome**

Silima Collin opened and welcomes the attendees and opens the meeting with a prayer.

2. **Roll call and apologies -**

Roll call was circulated and the following were the apologies

1) Nozi Malteno
2) Norman Tshivhula
3) Khuthadzo Manyatsha

3. **Introduction**

All people that attended introduced themselves

Matters arising

ITEMS	DELIBERATIONS	RESPONSIBILITY
4. **Matters arising**	The following matters arose from the previous minutes.	All

4.**1.NWI Presentation**	**<u>24-28 October 2016 - Swadini Spar (Mpumalanga)</u>** • We have two target of wetlands to meet on inventory this year. • So far we have only manage to collect 10 wetlands • Namhla will release the update of wetland inventory next year in June 2017. • Target must be met by then • LEDE target wetlands within the reserve and in Waterberg Rural communities • The 200 were divide and given to stake holder • Stakeholder commit to deliver on the inventory • At least 5 wetland must be captured each month • Forms to be submitted on the next meeting • LEDET warns of the duplication • Masidndi to share the list of wetland with all LEDET officials	All
4.2. Community Outreach / Wetland Awareness	**<u>Wayward</u>** • Awareness had been done through schools- on the 12th May kids were taken out to Wonderkop Nature reserve. • Unfortunately the outing was not very successful as the road were slippery towards the wetland side • Picture of Rietfontein wetland to be provided • There had been another celebration of wetland at Ga- Kgoroshi which went very well • Masidi had another celebration at Ga= Madisha • There had been awareness of wetland through wetland celebration at Mutale(Tshamulungwi) by Mutale Local m municipality	Prudence Lehlokgonolo Collin Masindi Sello

4.3 **Revision of Schedule meeting for 2016**	Meetings for 2016 were scheduled as follows:- • 19 – 20 May 2016, Mopani District • 15-16 September 2016 Vhembe • 17-18 November 2016 Sekhukhune • 17 February 2017- Polokwane	
4.4 **Mohlapitse Wetland**	• LUI Results are out • Sekhukhune District had been awarded a tender • We had Planted R500 000. For seeding • LEDET office need to be included in order to have more funding of wetland initiatives	
4.5 Corporate Governance	No update	
4.6. **Environmental pollution Challenges (How well have we done it, right track! what can be done to improve the status)**	**In Makhado** • There a sewage problem • The manage to fix one along the N1 road • One in Eltivilas not fixed In Waterberg • Acid spillage now under control • More water sample to be taken to determine the extent • Main challenge is the the stream is connected to Nylsvley • Meshack tand Prudence to provide the report on the spillage status **Sekhukhune** • Building wall in the wetland • Fence around the wetland and rehabilitation taking place • Illegal sand mining still continuing • This had been raised up with compliance	Prudence Daniel Collin Prudence Meshac Lehlokgonolo

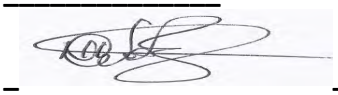
	office • Intervention were implemented • But the perpetuators had authorization from the Headman • No one is monitoring the process • This sans mining is reducing the surface area due to Donga **<u>Way forward on the Environmental problems</u>** **<u>In Makhado Municipality</u>** • They are opening a big sewage treatment which will take up huge pressure from the surrounding town • The challenge will be the height of flow and the structural design • The plant is working well regardless if this challenge • There had been complaining of contamination of the drinking water. Daniel to bring the results of the test conducted(10 June 2016) • Collin to follow it up	
4.8. Training	• Collin to follow up on Certificates • There will be training on the 12th July 2015 on wetland Mapping use of GIS install open source • Collin to send a training reminder to Namhla	All
5. Wetland Task team	Allocation of task/ target given to the task team LEDET -15 (Netshiozwi) DEA EPIP capricon – 5 DEA EPIP Mopani- 5 DEA EPIP Sekhukhune-5 SANParks Mapungubwe – 2 LEDET Waterberg- 5	Aprudence Eddi Netshiozwi Meshack Iris Sello Thabo

	SANParks Skkukuza- 5 LEDET Head office – 20 Mbonelaphanda -5 DEA WfWet - 50	Daniel David Collin
6. NEW MATTERS		
NEW MATTERS	No new matters	
7. **Date of the next meeting**	17-18 November – Vhembe District Municipality)	All
8. **Closure**	Closed with a prayer	Daniel Makhado Municipality

_____ _____

SECRETARY **DATE**

_____



_ _____

CHAIPERSON **DATE: 20 May 2016**

APPENDIX E4

HERITAGE IMPACT ASSESSMENT

Phase 1 Heritage Impact Assessment Report

HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED ANTI-EROSION MEASURES AT THE BALENI SALT WORKS PROVINCIAL HERITAGE SITE, LIMPOPO PROVINCE.

PREPARED BY:

PREPARED FOR:

CREDIT SHEET

Project Director

STEPHAN GAIGHER (BA Hons, Archaeology, UP)

Principal Investigator for G&A Heritage

Member of ASAPA (Site Director Status)

Tel: (015) 516 1561

Cell: 073 752 6583

E-mail: stephan@gaheritage.co.za

Website: www.gaheritage.co.za

Report Author

STEPHAN GAIGHER

Disclaimer; *Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. G&A Heritage and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

Statement of Independence

As the duly appointed representative of G&A Heritage, I Stephan Gaigher, hereby confirm my independence as a specialist and declare that neither I nor G&A Heritage have any interests, be it business or otherwise, in any proposed activity, application or appeal in respect of which the Environmental Consultant was appointed as Environmental Assessment Practitioner, other than fair remuneration for work performed on this project.

SIGNED OFF BY: STEPHAN GAIGHER

MANAGEMENT SUMMARY

Site name and location: Proposed Anti-Erosion Measures at the Baleni Salt Works.

Municipal Area: Giyani District Municipality.

Applicant: Working for Wetlands Program of the Department of Environmental Affairs.

Consultant: G&A Heritage, PO Box 522, Louis Trichardt, 0920, South Africa
38A Vorster St, Louis Trichardt, 0920

Date of Report: 04 December 2018

The purpose of the management summary is to distil the information contained in the report into a format that can be used to give specific results quickly and facilitate management decisions. It is not the purpose of the management summary to repeat in shortened format all the information contained in the report, but rather to give a statement of results for decision making purposes.

This study focuses on the proposed anti-erosion measures recommended by the planning team for the Working for Wetlands Program to limit the negative impact of concentrated water flow at the wetlands around Baleni, Limpopo Province.

This study encompasses the heritage impact investigation. A preliminary layout has been supplied to lead this phase of this study.

Scope of Work
A Heritage Impact Assessment (including Archaeological, Cultural heritage, Built Heritage and Basic Paleontological Assessment) to determine the impacts on heritage resources within the study area.

The following are required to perform the assessment as per SAHRA minimum standards:

- A desk-top investigation of the area;
- A site visit to the proposed mitigations;
- Identify possible archaeological, cultural, historic, built and paleontological sites within the study area;
- Evaluate the potential impacts of construction and operation of the project on archaeological, cultural, historical resources; built and paleontological resources; and
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural, historical, built and paleontological importance.
- Public Participation

The purpose of this study is to determine the possible occurrence of sites with cultural heritage significance within the study area. The study is based on archival and document combined with fieldwork investigations.

Alternatives Considered
Due to the Working for Wetlands Programme not being a development proposal (but rather a rehabilitation programme), the use of alternatives as normally applied in terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) is not appropriate. A comprehensive phased approached is undertaken each year to identify wetlands with a high rehabilitation priority (Phase 1), rehabilitation objectives for each wetland unit and the most appropriate interventions to achieve these objectives (Phase 2). During Phase 3, the interventions are again scrutinised during setting-out to to consider changes that have occurred within the landscape since the original planning took place. Should any significant changes be required to the intervention, the Project Team will be informed by the engineer to ensure that the proposed design changes would not compromise the rehabilitation objectives identified for the specific wetland. For this reason, the mitigative measures identified in this report does not have any alternatives.

Findings & Recommendations
The area was investigated during a field visit and through archival studies.
The status of the site as a National Heritage Site in 1999 (Terblanche 1994a) already implied the heritage significance of the site. It was therefore not surprising that several areas with archaeological deposits were noted during the survey. Some of these sites are subject to degradation due to erosion activities. These sites will be discussed in this study and relevant recommendations for their preservation or mitigation given.

Fatal Flaws
No fatal flaws were identified.

TABLE OF CONTENTS

List of Figures

List of Abbreviations

Bp..... Before Present

EIA .....Early Iron Age

ESA..... Early Stone Age

Fm..... Femtometre (10^{-15}m)

GPS ..... Geographic Positioning System

HIA ..... Heritage Impact Assessment

LIA.....Late Iron Age

LSA .....Late Stone Age

MYA ..... Million Years Ago

MSA .....Middle Stone Age

NHRA.....National Heritage Resources Act no 22 of 1999

SAHRA..... South African Heritage Resource Agency

SANRAL .....South African National Roads Agency SOC Ltd

S&EIR ..... Scoping & Environmental Impact Reporting

Um .....Micrometre (10^{-6} m)

WGS 84 ..... World Geodetic System for 1984

Chapter 1

PROJECT RESOURCES

HERITAGE IMPACT REPORT

HERITAGE IMPACT ASSESSMENT REPORT FOR THE PROPOSED ANTI-EROSION MEASURES AT BALENI SALT WORKS, LIMPOPO PROVINCE

1. INTRODUCTION

Legislation and methodology

G&A Heritage was appointed by Aurecon South Africa (Pty) Ltd (Aurecon) to undertake a heritage impact assessment for the proposed Anti-Erosion Measures at the Baleni Salt Works in the Limpopo Province.

Section 38(1) of the South African Heritage Resources Act (25 of 1999) requires that a heritage study is undertaken if any activity triggers an HIA as per Table 2.

(a) Construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
(b) Construction of a bridge or similar structure exceeding 50 m in length; and
(c) Any development, or other activity which will change the character of an area of land, or water –
(1) Exceeding 10 000 m^2 in extent;
(2) Involving three or more existing erven or subdivisions thereof; or
(3) Involving three or more erven, or subdivisions thereof, which have been consolidated within the past five years; or
(d) The costs of which will exceed a sum set in terms of regulations; or
(e) Any other category of development provided for in regulations.

While the above describes the parameters of developments that fall under this Act., Section 38 (8) of the NHRA is applicable to this development. This section states that;

(8) *The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.*

In regard to a development such as this that falls under Section 38 (8) of the NHRA, the requirements of Section 38 (3) applies to the subsequent reporting, stating that;

(3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2) (a): Provided that the following must be included:
(a) The identification and mapping of all heritage resources in the area affected;
(b) An assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6 (2) or prescribed under section 7;
(c) An assessment of the impact of the development on such heritage resources;
(d) An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;

(e) The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;

(f) If heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and

(g) Plans for mitigation of any adverse effects during and after the completion of the proposed development.

(1) Ancestral graves,
(2) Royal graves and graves of traditional leaders,
(3) Graves of victims of conflict (iv) graves of important individuals,
(4) Historical graves and cemeteries older than 60 years, and
(5) Other human remains which are not covered under the Human Tissues Act, 1983 (Act No.65 of 1983 as amended);

(h) Movable objects, including ;
(1) Objects recovered from the soil or waters of South Africa including archaeological and paleontological objects and material, meteorites and rare geological specimens;
(2) Ethnographic art and objects;
(3) Military objects;
(4) Objects of decorative art;
(5) Objects of fine art;
(6) Objects of scientific or technological interest;
(7) Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings; and
(8) Any other prescribed categories, but excluding any object made by a living person;

(i) Battlefields;
(j) Traditional building techniques.

A '**place**' is defined as:
(a) A site, area or region;
(b) A building or other structure (which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure);
(c) A group of buildings or other structures (which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures); and (d) an open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place.

'**Structures**' means any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

'**Archaeological**' means:
(a) Material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
(b) Rock art, being a form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and is older than 100 years including any area within 10 m of such representation; and
(c) Wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land or in the maritime cultural zone referred to in section 5 of the Maritime Zones Act 1994 (Act 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;
(d) Features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

'Paleontological' means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

'Grave' means a place of interment and includes the contents, headstone or other marker of and any other structures on or associated with such place. The South African Heritage Resources Agency (SAHRA) will only issue a permit for the alteration of a grave if it is satisfied that every reasonable effort has been made to contact and obtain permission from the families concerned.

The removal of graves is subject to the following procedures as outlined by the SAHRA:

- Notification of the impending removals (using English, Afrikaans and local language media and notices at the grave site);
- Consultation with individuals or communities related or known to the deceased;
- Satisfactory arrangements for the curation of human remains and / or headstones in a museum, where applicable;
- Procurement of a permit from the SAHRA;
- Appropriate arrangements for the exhumation (preferably by a suitably trained archaeologist) and re-interment (sometimes by a registered undertaker, in a formally proclaimed cemetery);
- Observation of rituals or ceremonies required by the families.

The limitations and assumptions associated with this heritage impact assessment are as follows;

- Field investigations were performed on foot and by vehicle where access was readily available.
- Sites were evaluated by means of description of the cultural landscape, direct observations and analysis of written sources and available databases.
- It was assumed that the site layout as provided by Aurecon is accurate.
- We assumed that the public participation process performed as part of the Basic Assessment process was sufficiently encompassing not to be repeated in the Heritage Assessment Phase.

Table 1. Impacts on the NHRA Sections

Act	Section	Description	Possible Impact	Action
National Heritage Resources Act (NHRA)	34	Preservation of buildings older than 60 years	No impact	None
	35	Archaeological, paleontological and meteor sites	No impact	None
	36	Graves and burial sites	Yes	Avoidance
	37	Protection of public monuments	No impact	None
	38	Does activity trigger a HIA?	Yes	HIA

Table 2. NHRA Triggers

Action Trigger	Yes/No	Description
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length.	Yes	Cattle fence line. Total length 535m
Construction of a bridge or similar structure exceeding 50m in length.	No	N/A
Development exceeding 5000 m^2	No	N/A
Development involving more than 3 erven or sub divisions	No	N/A
Development involving more than 3 erven or sub divisions that have been consolidated in the past 5 years	No	N/A
Re-zoning of site exceeding 10 000 m^2	No	N/A
Any other development category, public open space, squares, parks or recreational grounds	No	N/A

2. Background Information

2.1 Project Description

The Working for Wetlands Programme will be commencing with planning to undertake wetland rehabilitation activities at Soutini-Baleni in Limpopo. This will involve a series of Hard Interventions such as;

- Earth berms or gabion systems to block artificial channels that drain water from or divert water to the wetland;
- Concrete and gabion weirs to trap sediment and reduce the erosion potential of concentrated flow;
- Earth or gabion structure plugs to raise channel floors and reduce water velocity;
- Concrete or gabion structures to stabilise head-cut or other erosion and prevent gullies;
- Concrete and/or reno mattress strips as road crossings to address channels and erosion in wetlands from vehicles; and

A “soft intervention” is also proposed to manage grazers within the wetland and involves the use of a low fence to exclude grazers from the eye (i.e. protection measure against overgrazing and trampling).

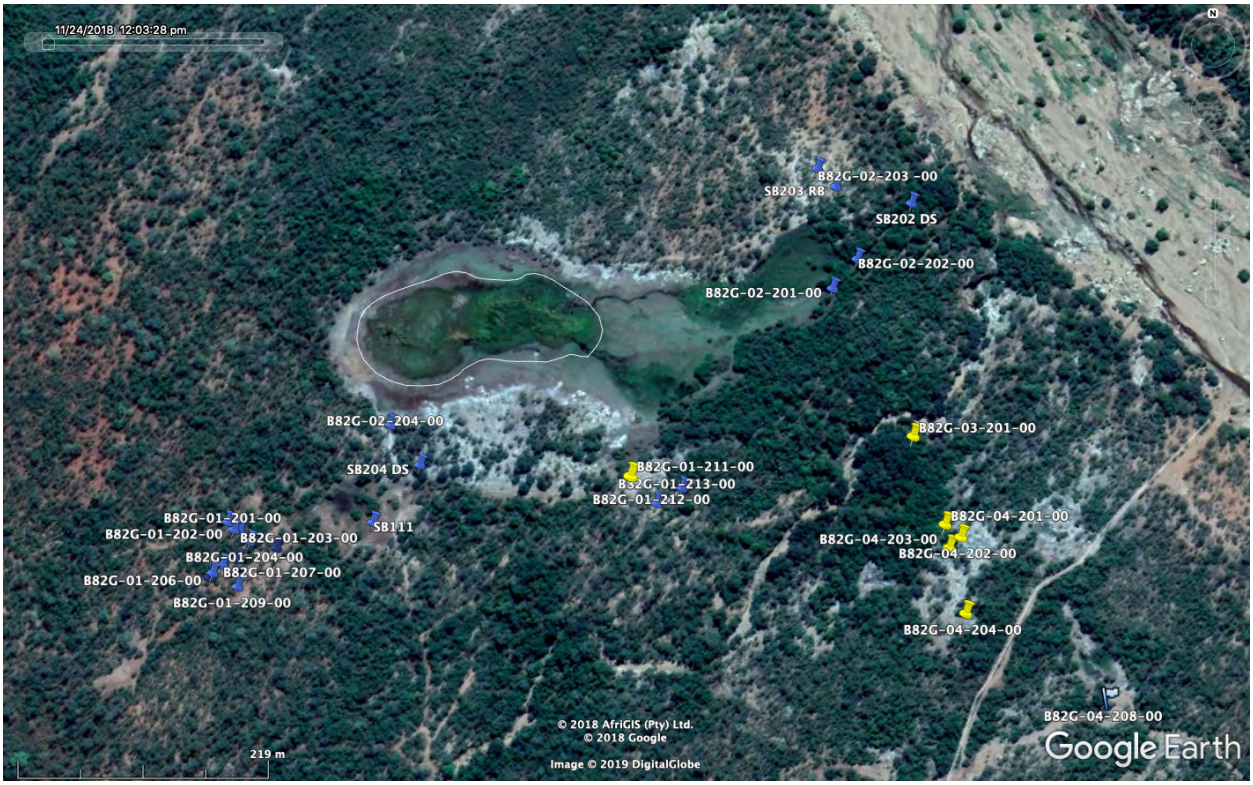


Figure 1. The Wetland and Proposed Actions (please see list below for descriptions)

Intervention no	Origin	Type
B82G-01-201-00	New	Rock/ Gravel Pack
B82G-01-202-00	New	Rock/ Gravel Pack
B82G-01-203-00	New	Rock/ Gravel Pack
B82G-01-204-00	New	Rock/ Gravel Pack
B82G-01-205-00	New	Rock/ Gravel Pack
B82G-01-206-00	New	Rock/ Gravel Pack Brush Pack
B82G-01-207-00	New	Rock/ Gravel Pack

B82G-01-208-00	New	Rock/ Gravel Pack
		Brush Pack
B82G-01-209-00	New	Brush Pack
B82G-01-210-00	New	Brush Pack
	POI	
B82G-01-211-00	New	Rock/ Gravel Pack
B82G-01-212-00	New	Rock/ Gravel Pack
	New	Earth Works
B82G-01-213-00	New	Stone Masonry/ Masonry
		Gabions
		Concrete (Low strength)
B82G-02-201-00	New	Rock/ Gravel Pack
	POI	
B82G-02-202-00	New	Silt fences
B82G-02-203-00	New	Rock/ Gravel Pack
	POI	
B82G-02-204-00	New	Earth Works
B82G-02-205-00	New	Cattle fence with walkway
B82G-03-201-00	New	Eco Logs
B82G-04-201-00	New	Brush Pack
B82G-04-202-00	New	Brush Pack
B82G-04-203-00	New	Brush Pack
B82G-04-204-00	New	Brush Pack
B82G-04-205-00	New	Brush Pack
B82G-04-206-00	New	Brush Pack
B82G-04-207-00	New	Brush Pack
B82G-04-208-00	New	Brush Pack
B82G-04-209-00	New	Brush Pack
B82G-03-202-00	New	Eco Logs

2.2 Project Location

The name Baleni, refers to a mineral hot spring located at S23.41875°, E30.91510°, and 380m above sea level. It is located approximately 20km southeast from the town of Giyani, and also falls within the borders of the Giyani Municipal District. Situated in the Limpopo Province, the district is bordered in the east by the Kruger National Park, in the south by the Groot Letaba River and in the north by the Shingwedzi River. The study area falls within the South African Lowveld - the area geographically defined as the low-lying areas east of the South African escarpment and west of the Lebombo Mountains on the Mozambique border (Onderstal 1984). For the purposes of this study, the northern Lowveld is defined as the area north of the Olifants River and south of the Limpopo river basin region. The Baleni research area covers the entire area within 1,5km around the salt pan. This encompasses the main salt working area around the spring, as well as the area peripheral to this, up to a distance of 1,5km measured from the spring's center.

2.3 GPS Track Paths

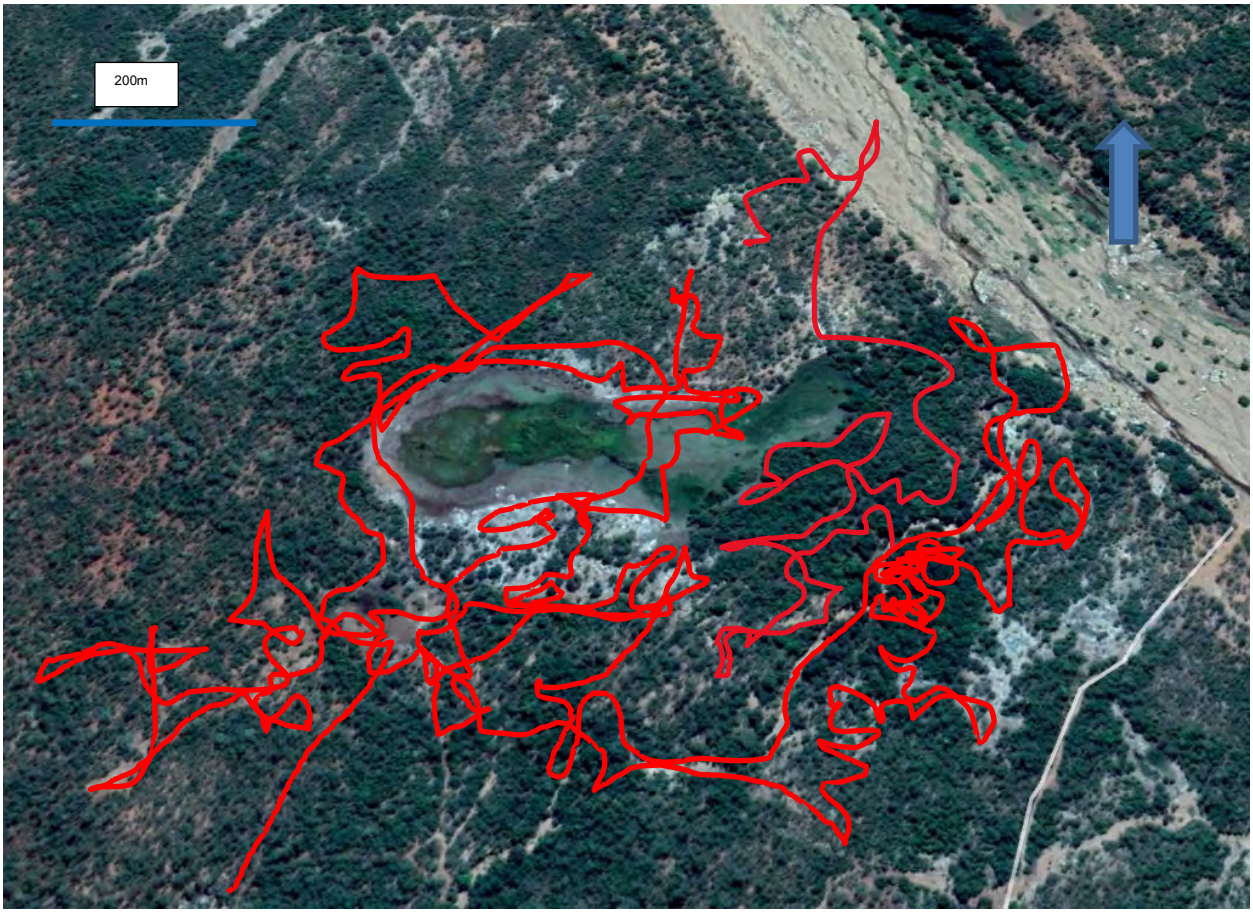


Figure 2. GPS Track Paths

Chapter 2

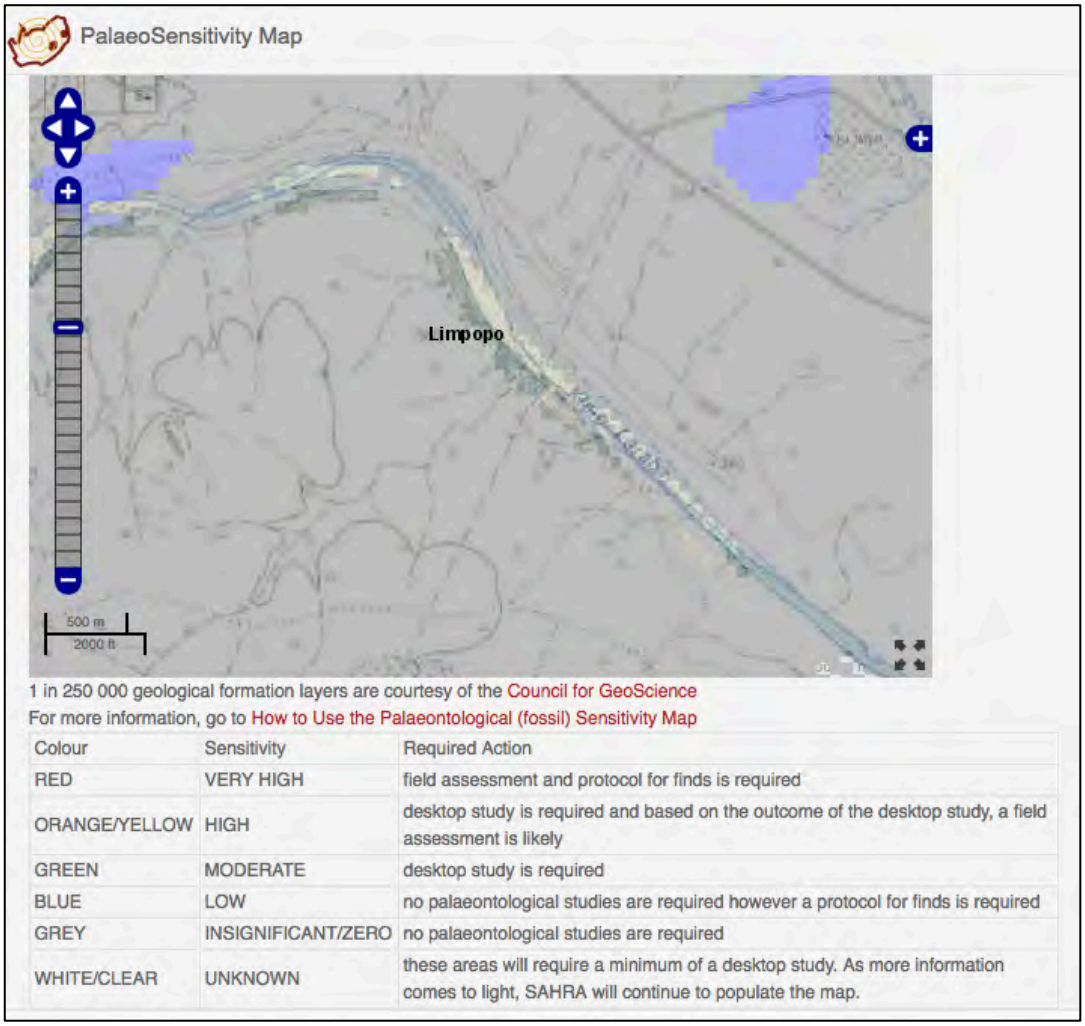
FINDINGS & CONTEXT

HERITAGE INDICATORS WITHIN THE RECEIVING ENVIRONMENT

3. REGIONAL CULTURAL CONTEXT

3.1 PALEONTOLOGY

The areas fall within the "Grey" demarcation on the *PalaeoSensitivity* Map. SAHRA states that in this case a no further work in terms of Palaeontology is needed.



Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 3. *PalaeoSensitivity* Map

3.2 Stone Age

Stone implements belonging to the Early, Middle and Late Stone Age have been found in the area. These, with the rock paintings and a few engravings are evidence of the presence of hunter-gatherer communities in the past. The Sarwa, who were known to be hunters and gatherers, were still living alongside farming communities such as the Ngona in the area during historical times after 1800 (Eastwood & Fish, 1995).

The antiquity of the Late Stone Age (LSA) south of the Limpopo was realized only recently. Until about 40 years ago it was assumed that Middle Stone Age (MSA) industries gave way to LSA ones at the beginning of the Holocene or at the end of the Pleistocene. As recently as 1974, for example, Sampson's synthesis of the southern African Stone Age placed the earliest LSA at 12,000 years before present (B.P.). Radiocarbon dating after the early 1970s dramatically altered previous ideas and showed that the LSA has its origin in the late Pleistocene, which is defined here as dating between ca. 40,000 and ca. 10,000 B.P.
When Goodwin (1926) introduced the term Later Stone Age (LSA), and when the term was further developed by Goodwin and Van Riet Lowe (1929) in the late 1920s, their definition was unambiguous. The LSA was defined as several stone industries and/or cultures that included non-lithic items, such as ostrich eggshell beads and worked bone implements, and excluded Middle Stone Age (MSA) stone tools, except as recycled manuports. LSA people were explicitly linked with the biologically and behaviourally modern population of hunter gatherers, some being directly identified as Bushmen (Goodwin, 1926, p. 20; Goodwin and Van Riet Lowe, 1929, p. 171).

Today Goodwin and Van Riet Lowe's LSA definition is no longer entirely appropriate. First, ostrich eggshell beads and even a bone point have been found in MSA deposits that predate the LSA by tens of thousands of years. If the associations are reliable then these artifacts can no longer be seen as exclusively LSA. Second, fossils of anatomically modem humans, now thought to predate 100,000 B.P., have been found in MSA deposits at both Klasies River Mouth and at Border Cave (Beaumont et al, 1978; Singer and Wymer, 1982; Rightmire and Deacon, 1991). There is thus no correlation between the appearance of modern people and LSA technological evolution.
The only part of the 1920s definition that remains intact is the qualifier that LSA assemblages should lack MSA artifacts. Although LSA industries and their MSA predecessors share flaking traditions such as the bipolar technique and have some tool types in common, such as some generalized scraper types, they each have other flaking techniques and artifacts that are considered mutually exclusive.

From the 1950s onwards, archaeologists excavating MSA sites in the interior of South Africa recognised a lithic industry containing long blades, truncated blades with retouched edges, and long unifacial points. They named it after the town of Pietersburg (now Polokwane). Pietersburg Industries are located principally in the north of South Africa, but they have not yet been documented north of the Limpopo River. Most Pietersburg sites in Limpopo Province are caves or rockshelters, the best known being Cave of Hearths (Mason 1962, 1988; Sampson 1974; Sinclair 2009), Olieboomspoort (Mason 1962; Van der Ryst 2006), Bushman Rock Shelter (Plug 1981; Porraz et al. 2015) and Mwulu's Cave (Tobias 1949; Sampson 1974). The open site Blaaubank, a gravel donga near Rooiberg, has many felsite and quartzite Pietersburg tools overlying Earlier Stone Age ones (Mason 1962). Another open site, Kalkbank, also reported to have a Pietersburg industry, yielded only a few dozen lithics (Mason 1962) amongst the large faunal collection that is now known to have been accumulated predominantly by non-human agents (Hutson & Cain 2008).

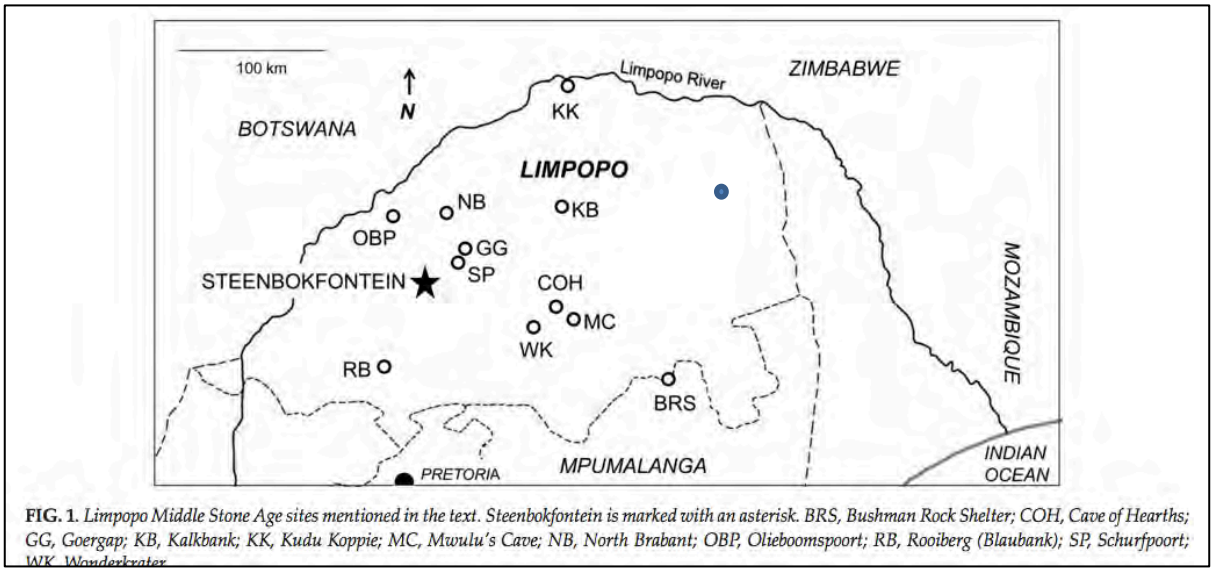


FIG. 1. *Limpopo Middle Stone Age sites mentioned in the text. Steenbokfontein is marked with an asterisk. BRS, Bushman Rock Shelter; COH, Cave of Hearths; GG, Goergap; KB, Kalkbank; KK, Kudu Koppie; MC, Mwulu's Cave; NB, North Brabant; OBP, Olieboomspoort; RB, Rooiberg (Blaubank); SP, Schurfpoort; WK, Wonderkrater*

Figure 4. Limpopo Middle Stone Age sites mentioned in the text (Hutrson & Cain, 2008) (Baleni in blue)

Most excavated MSA sites in Limpopo are below the escarpment, but amongst the known ones on the Waterberg plateau, is a small rock shelter, North Brabant (New Belgium 608 LR), which was excavated by Schoonraad and Beaumont (1968).

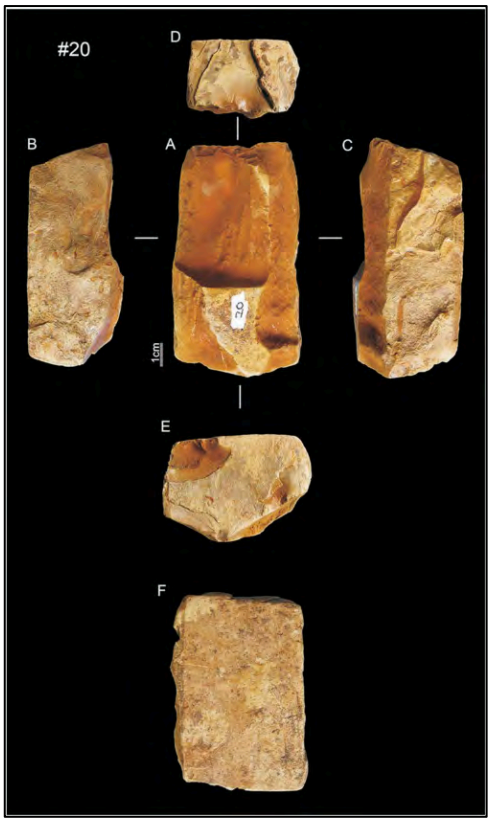


Figure 5. Middle Stone Age Tools

Figure 6. Middle Stone Age Tools

The Limpopo Province of South Africa has a rich archaeological heritage, not least of which is the sub-continent's first town, Mapungubwe, built a thousand years ago (Huffman 2000, 2007). The iron-using farmers who arrived here during the first millennium AD encountered indigenous, stone tool- using, 'Later Stone Age' (LSA) hunter-gatherers. The nature of this contact between two radically different ways of life, and the question of whether the hunter-gatherers survived it, has been much debated (e.g. Mazel 1989; Wilmsen 1989; Solway & Lee 1990; Wilmsen & Denbow 1990; Wadley 1996; Sadr 1997, 2002; Hall & Smith 2000; Schoeman 2006; Mitchell 2009). Where the Limpopo and Shashe Rivers meet, it seemed that the LSA hunting and gathering way of life ended with the rise of the first farmer towns (Sadr 2005; Van Doornum 2007). Recent excavations in rock shelters on the Makgabeng plateau, a hundred or so kilometres south of the Limpopo River, indicate that some hunter-gatherers found refuge there until the 19th century. [BRADFIELD, J., HOLT, S., & SADR, K. (2009).

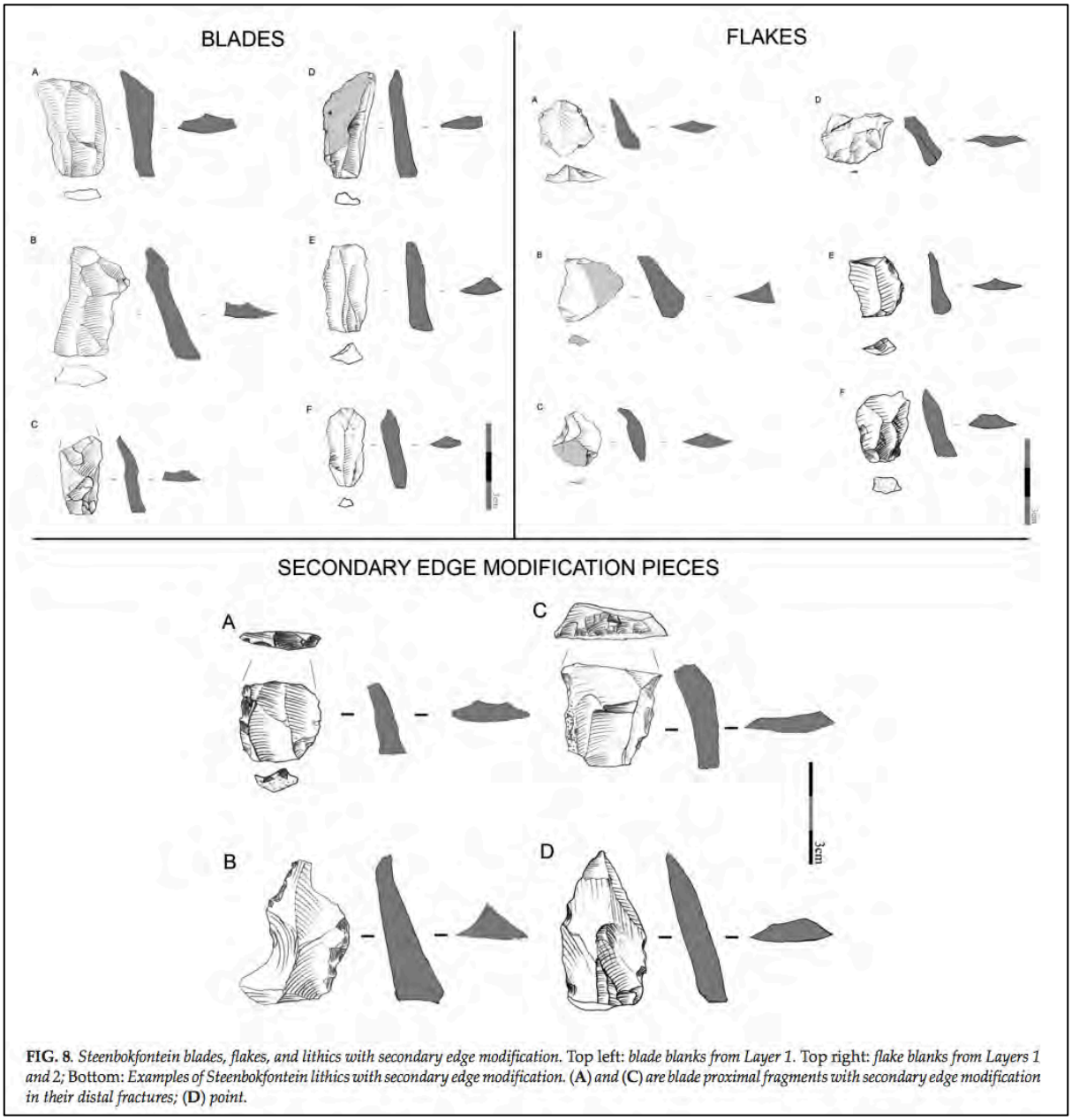


FIG. 8. *Steenbokfontein blades, flakes, and lithics with secondary edge modification.* Top left: *blade blanks from Layer 1.* Top right: *flake blanks from Layers 1 and 2;* Bottom: *Examples of Steenbokfontein lithics with secondary edge modification.* (**A**) *and* (**C**) *are blade proximal fragments with secondary edge modification in their distal fractures;* (**D**) *point.*

Figure 7. Steenbokfontein blades, flakes and lithics with secondary edge modification.

Rock Art

The Central Limpopo Basin (CLB) is situated nearly equidistant between the rock art concentrations of the Maloti/Drakensberg Mountains of Lesotho/South Africa and the Matopo Hills of Zimbabwe and comprises four separate and distinct rock art areas: the Limpopo-Shashe Confluence Area (LSCA), Northern Venda, the Soutpansberg and the Makgabeng Plateau (Fig. 1). The region is relatively well researched (e.g. Schoonraad 1960; Willcox 1963; Pager 1975, 1977, Eastwood 1999, 2003, 2005; Eastwood & Blundell 1999; Eastwood & Cnoops 1999; Eastwood et al. 1999; Hall & Smith 2000; Blundell & Eastwood 2001; Smith & Ouzman 2004), and since 1992 roughly 60% of the total land area has been surveyed and a total of 953 rock art sites have been located and recorded. Whilst the survey work continues, and much recording work remains to be done, the CLB data set is already amongst the most detailed in southern Africa. [Eastwood, E., & Smith, B. (2005).

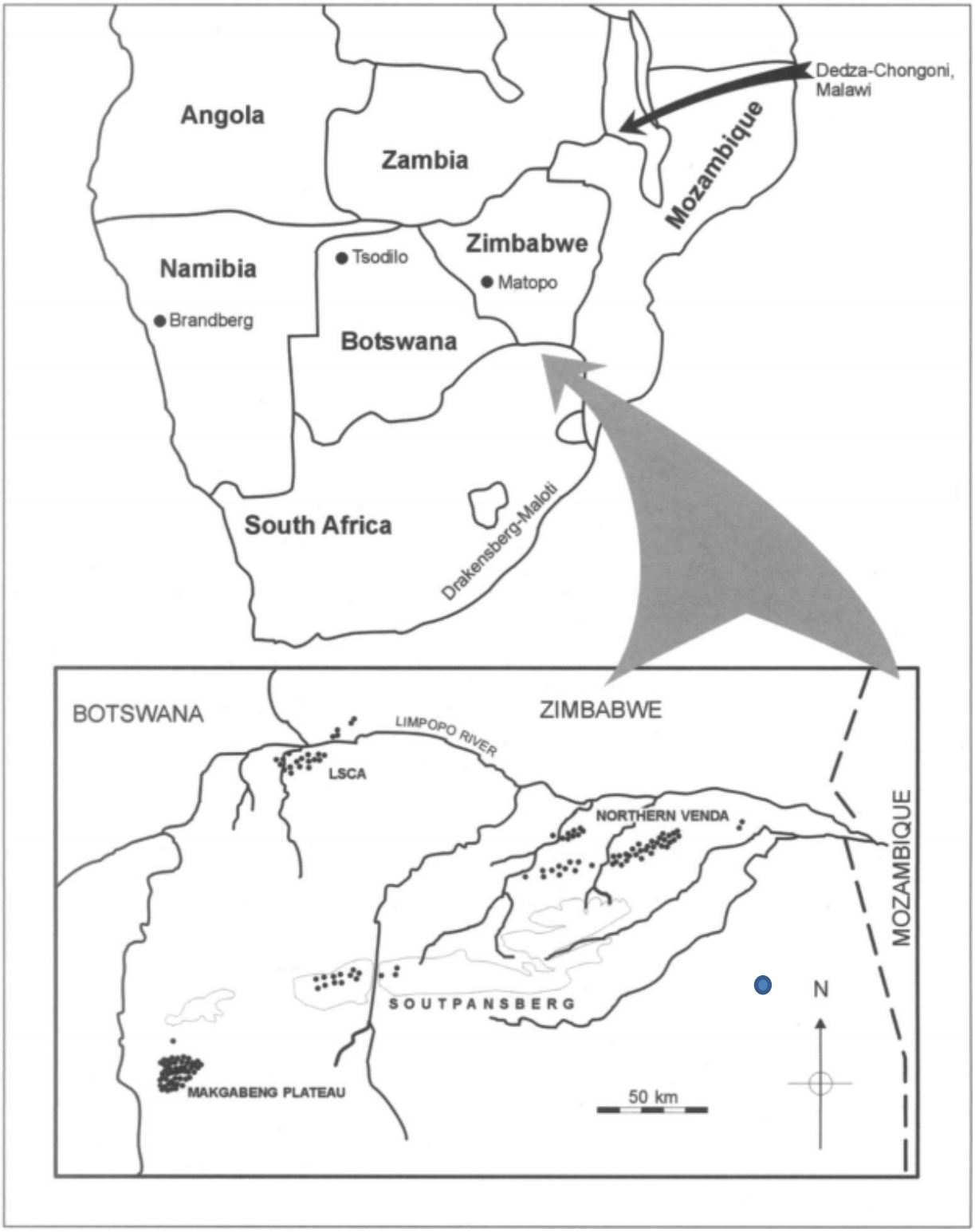


Figure 8. Rock Art Locations (Blue dot indicates Baleni)

Figure 9. Khoekhoen Geometric Patterns and Finger Dot Painting (Makgabeng Plateau)

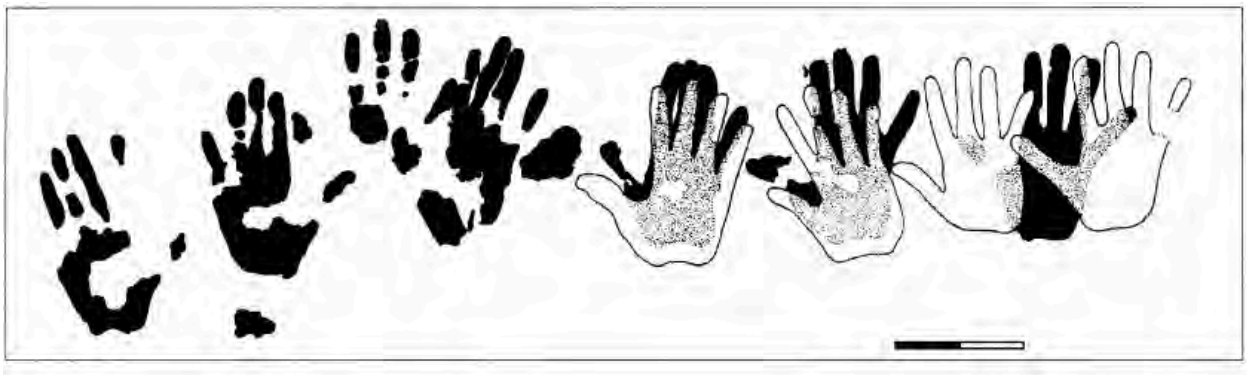


Figure 10. Red handprints overlain by white handprints, Soutpansberg, Central Limpopo Basin. Scale 200mm

3.3 Iron Age

The Limpopo Province and especially the Shashe/Limpopo Confluence area (SLCA) and the Limpopo Basin area contains many Iron Age sites. Although Early Iron age sites are limited (when a distinction is made between Early and Middle Iron Age) there are some important sites on the Soutpansberg such as Happy Rest.

The most significant Iron Age industry in Limpopo must be the Leopards Kopje of Mapungubwe/K2 Industry. These sites are found scattered across the province, although the majority of paramount sites seems to be concentrated on the Limpopo and Levhuvhu Rivers.

Sites that are culturally related to K2 and Mapungubwe have been observed on Hamilton 41 MS, Samaria 28 MS and Den Staat 27 MS (Fig. 1). Another site related to Mapungubwe was excavated by Van Wyk (1987) on Skutwater to the east of Greefswald. Small Iron Age sites postdating Mapungubwe and K2 have been recorded on Greefswald, including some stone-walled sites on hilltops. Some of these sites have been identified by T.N. Huffman as Khami type ruins. (Huffman 2009). According to oral

tradition, communities belonging to the Lea and Twa mamba tribes, related to the Venda and the Shona-speaking people, settled in the Greefswald region in historical times. They were followed, after c. AD 1700, by Sotho-speaking people.

A few physical features distinguish Khami muzinda (plural = mizinda , the Shona word for a chief's place) from Zimbabwe centres. For example, Khami palaces often bear check patterns, and the pottery usually incorporates black and red motifs on globular vessels and tall-necked jars. The distribution of Khami markers and the linguistic history of the Zimbabwe culture area show that the Khami phase marks the distribution of Kalanga-speaking polities.
Radiocarbon dates from Khami itself (Huffman 2007: 258-259), the name site (Robinson 1959) for the phase and the largest capital (second only to Great Zimbabwe), suggest an early 1 5th century beginning. At about the same time, Kalanga groups began to move southwards. The Letsibogo district of Botswana (Campbell et al 1996; Huffman & Kinahan 2002/2003) provides one example. Khami settlements first appear in the Mapungubwe landscape at this same time (Fig. 2). So far, there are some 255 commoner homesteads (Level 1 – Family Head) on record. These homesteads probably housed some 50 people at any one time, 20-30 being children (following Huffman 1986). There are 10 other hilltop sites with stonewalled palaces. These royal centres are all the same size (Level 3 - Petty Chief), supporting about 350 people each. [Huffman, T., & Du Piesanie, J. (2011).

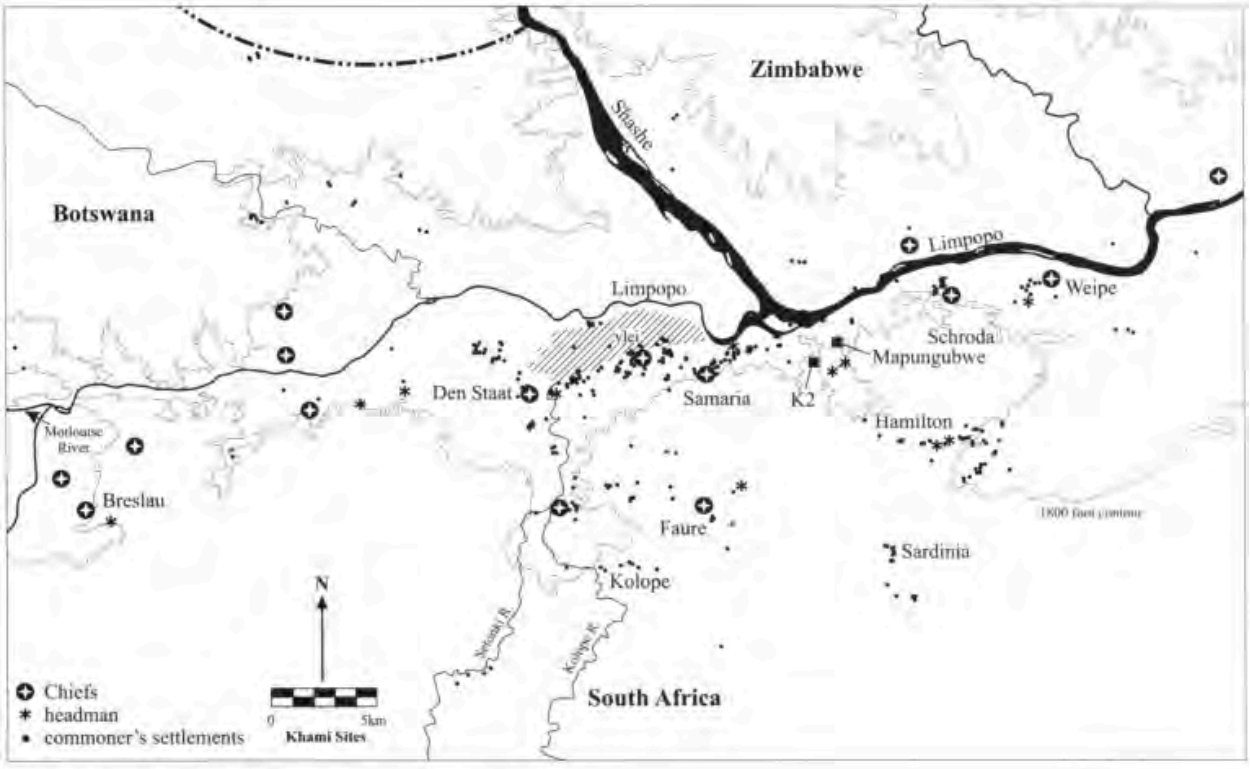


Figure 11. Khami-period sites in the Mapungubwe landscape

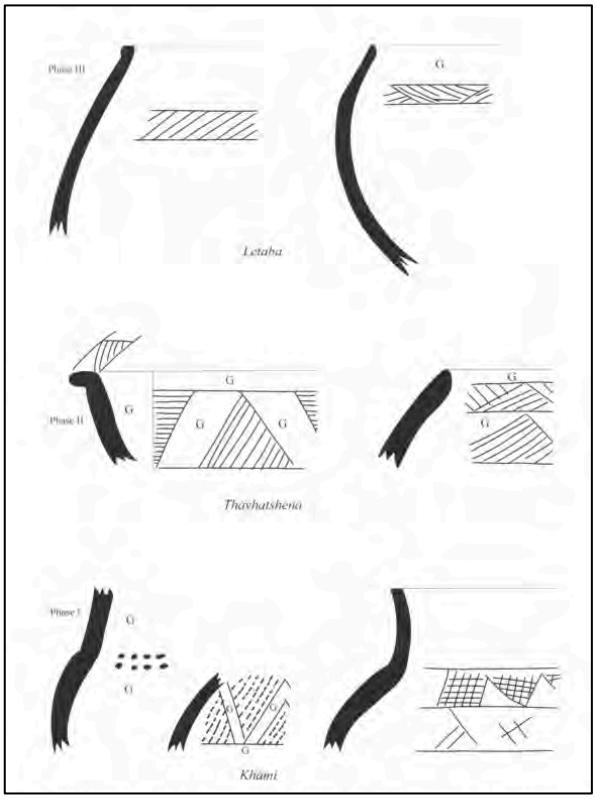


Figure 12. Ceramic facies associated with the three phases of occupation at Machemma

3.4 The Historic Era

Louis Johannes Tregard was born on the 10th of August 1783 in Oudtshoorn in the Karoo. Very little is known of his upbringing, but the diaries he kept of these endeavours, show him to be a reasonably well-educated man. Tregard later wrote his name as Tregardt, but it must be noted that there are a number of variants of the name, i.e. Trigardt, Triegardt and the most common, Trichardt. The latter form has been used for towns named in his honour.

Tregardt started farming in Boschberg and later at Somerset East. He moved across the Fish River in 1834 and rented land new the Kei River from the Xhosa chief, Hintsa. Here, in Xhosa country, he was acknowledged as a leader among the exiled Boer community of approximately 30 families. There exists evidence to suggest that Tregardt had shown overt hostility towards the British regime and he was even accused of inciting the Xhosa to begin the frontier war of 1834-5. When he learned that the authorities had issued a warrant for his arrest, Tregardt slipped away from this farm in Hintsa's country and crossed the Orange River. There he received support and assistance from Hendrik Potgieter and Johannes van Rensburg.

Tregardt and his family, as well as Hans van Rensburg's group, started the trek into the far north and arrived at the foot of the Soutpansberg Mountain range in 1836 in two separate parties, as they had parted ways en route due to a disagreement. Van Rensburg's party continued east towards Inhambane, but his entire group was exterminated en route. Tregardt's group was joined by the first group to arrive in the area under the leadership of Coenraad De Buys (the progenitor of the De Buys / Buys people who still live in Buysdorp – a settlement west of Louis Trichardt), who came to the area in 1821. They formed an alliance and aided the Ramabulana to replace the western Venda Chief, Ramavhoya assuming control of the salt plan north of the Soutpansberg Mountain. Tregardt remained in the area for about one year, before leading reconnaissance missions into current day Zimbabwe and towards Mozambique in search of the van Rensburg clan, the made their way to Delagoa Bay 7 months after setting off in September 1837. The trek claimed the lives of many in the party, including Tregardt, who succumbed from malaria in October of 1938.

After his death other Voortrekkers settled in the area as ivory hunters but left after Chief Makhado and his vhaVenda people defeated them in 1867. Only in 1898 did the *Zuid-Afrikaansche*

Republiek take control of the region and established the town Louis Trichardt the following year in February 1899.

Along with other towns in Limpopo Province, Louis Trichardt was renamed Makhado in 2003, after the Venda King Makhado who ruled in the region from the mid-1800s until his death in 1887. However, there was local rejection to the new name, and it was claimed less than 1% of the town's population had been consulted on the change. It was not only the Afrikaans people who were opposed to the name change, many Shangaan people regarded Chief Makhado as an oppressor. A residents' association applied to Pretoria's High Court in 2005 to have the name overturned. They were rejected but rather astonishingly appealed in South Africa's Supreme Court and won, and the name was changed back to Louis Trichardt in 2007.

3.5 Salt Extraction at Baleni

Archaeologists have visited the saltworks in the past, drawing on the modern salt extraction activities for comparative data applicable to their own studies (e.g. Evers 1974).
Evers (1974; 1981) after visiting the site remarks on the similarities of the Baleni deposits with that of Eiland and Harmony. The continued extraction and the methods employed at the site have also been recorded by other observers (e.g. De Witt 1966; (Terblanche 1994)). Observations at Baleni have also been used to reconstruct traditional salt making methods at the Tsonga Kraal Open Air Museum (Terreblanche 1994).

As elsewhere in Africa, present-day salt extraction at Baleni is an exclusively dry season activity. The salt-season usually starts in May, the precise day of commencement being decided on beforehand by consulting the ancestral spirits (Terblanche 1994).

The first step in the extraction process is to construct the filters through which the salt is leached. The filters are mostly made from the branches and bark of the mopane tree (*Colophospermun mopane*). These filters vary in size, but must be high enough to place a container underneath. Four forked poles are planted into the ground approximately 40cm – 60cm from each other to form a square. Four other poles are placed in the forks of the planted poles and tied together using bark from a mopane tree. A hanging sieve from bark and thin branches is woven onto this structure. This sieve is held into position by supple mopane rods and lined with dry grass. Using clay from an anthill, the inside is built up into a cone shape leaving only a small hole in the bottom through which water can drip. This hole is usually covered with dry grass or leaves (Terblanche 1994).

The next step is to scrape off the salt crust on the edge of the swamp. Terblanche (1994) mentions that the shell of a freshwater mussel is used for his practice. This mixture of soil and salt is then taken to the filter where it is mixed with an equal amount of river sand. The river sand loosens the texture of the gathered crust, which would otherwise be too clayey. A suitable quantity of this mixture is then placed in the filter. Once in the filter, water obtained from the river is poured over the mixture. This process is repeated until the receptacle underneath the filter is filled with the saltwater extraction. After water has been poured over the salt-soil mixture two or three times, the content of the filter is scraped out and discarded next to the filter (Evers 1981; Terblanche 1994). The bulk of the archaeological deposit found at Baleni are mounds formed by the scraped-out filter content.

The saltwater mixture is then placed in a container over a fire and boiled slowly so that the water evaporates, leaving only moist salt behind. The crystallized salt is then scraped into a pot, a large potsherd or calabash, again using a freshwater mussel shell. On questioning the meaning of the shell's use, Terblanche (1994) was informed that it used because it was always the practice, since iron objects will rust on contact with the salt. When there is enough, the damp salt is formed into a cone shape. This is done by pouring the content onto a flat surface and forming the cone by ladling it with the hands. Terblanche indicates that at times coals are placed on the cone to form a hard crust on the surface. Sometimes the cone is also paced on dry grass, which is then burnt in order to produce the same effect. Witt (1966) mentions a process where the cone is placed in the sun in order for it to dry, and then baked in a clay pot placed on a fire. Measurements of the cones found that the cones weighed between 1 and 2 kg (Terblanche 1994).

Figure 13. Mopane and Sand Filters

Figure 14. Salt Water Being Filtered

Figure 15. End Product

Figure 16. Salt Makers with Members of the Study Team

3.7 Historical Maps

The following historic map-sets were consulted during the study;

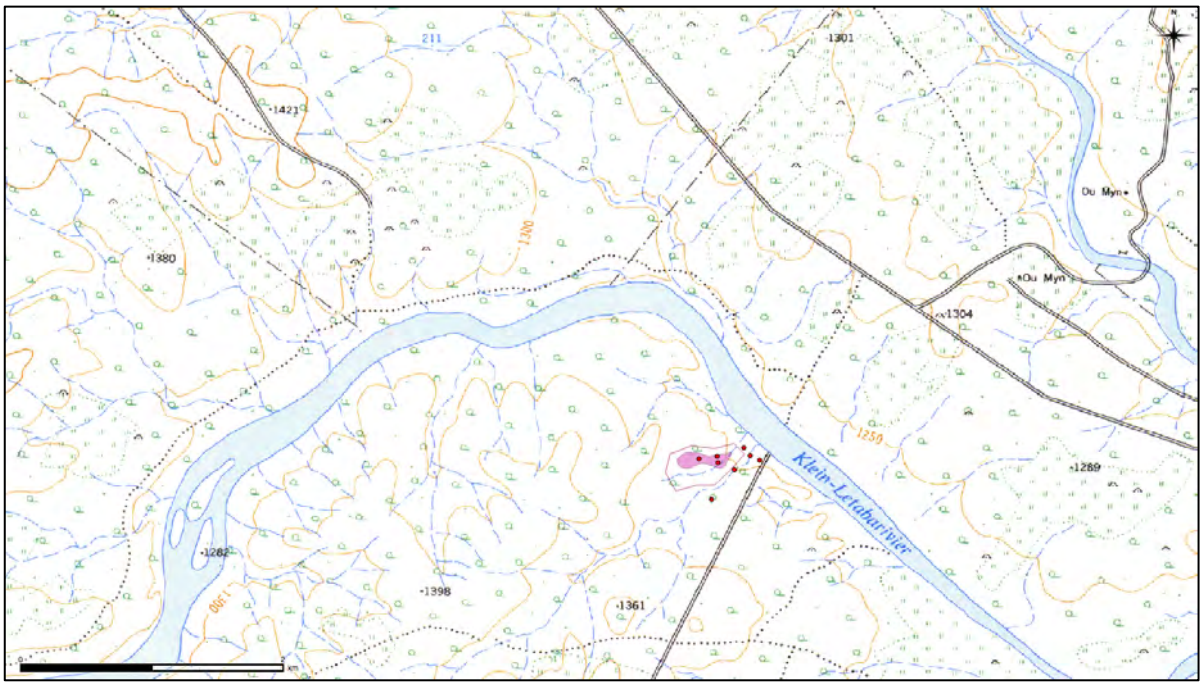


Figure 17. 1967 Map (Site location in pink as well as in all subsequent maps)

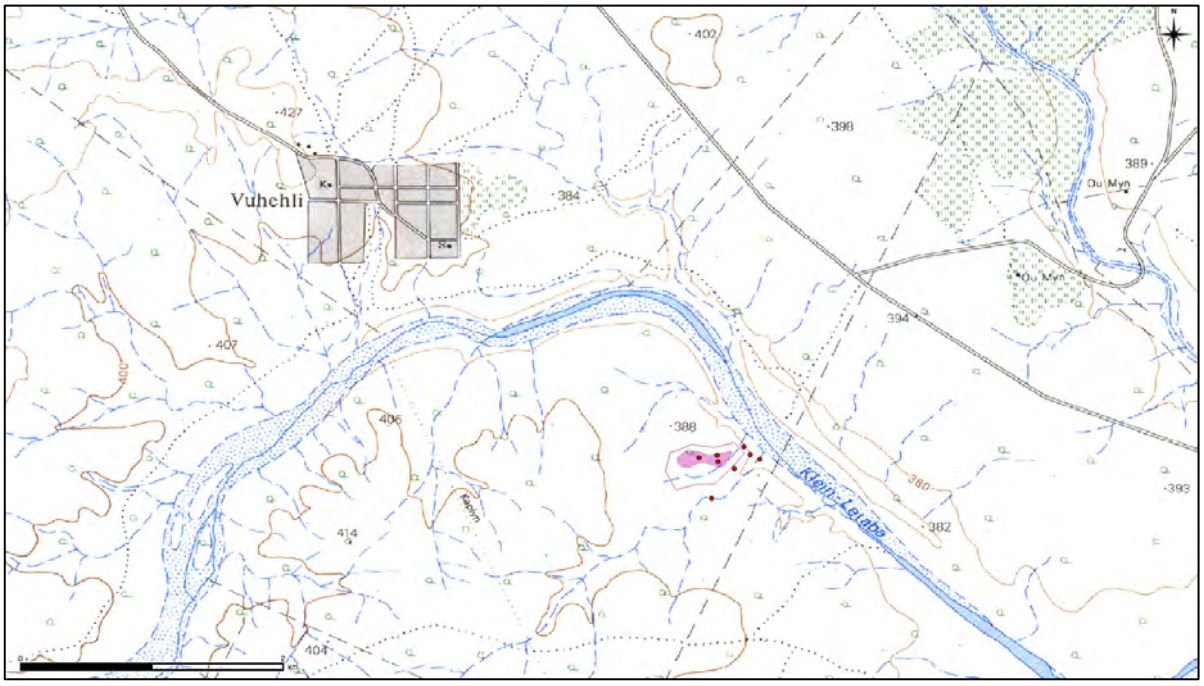


Figure 18. 1980 Map

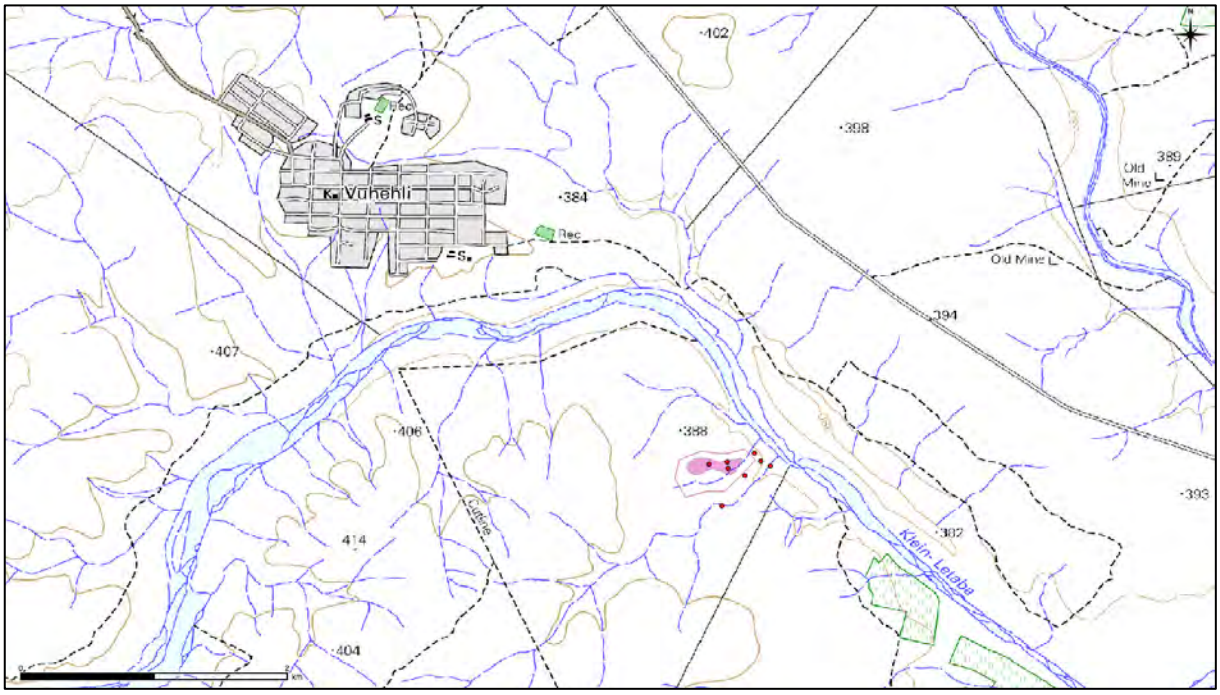


Figure 19. 1997 Map

No structures of heritage significance could be identified on the historical maps of the area.

4. Findings

4.1 Fieldwork Results

Several concentrations of potsherds and ash was noticed in the areas around the Baleni Wetland. None of these sites were however to be affected by the proposed erosion mitigation measures. The only site that would potentially be affected was located on the edge of a natural drainage ditch which was earmarked for stabilization. This will be designated as Site 1 as per Fig 25.

4.1.1 Site 1

GPS 23°25'14,6" S
30°54'46,6" E

This site contained a large concentration of potsherds (some of which was diagnostic) with ash deposits and the remains of hut rubble. It is situated on the eastern side of an erosion donga flowing north-south and draining into the Middle Letaba River. Some deposits were also noted on the western side of the donga suggesting that the site has been split by the erosion.

Figure 20. Potsherd on site

Figure 21. Potsherd on site

Figure 22. Deposits within vertical erosion wall

Figure 23. Gravel remains of a hut

Figure 24. Possible extent of Site 1 deposits.

Discussion

During 2004/2005, Alexander Antonites performed a survey and excavation at the Baleni Salt works describing sites and settlement distribution within this area. Antonites identifies a possible site (designated BS02) close to the location of Site 1. Although several different locations are both given in the text and maps for the site, the GPS coordinates indicate that it might be the same site as Site 1. The document was found to be flawed when it came to site locations, however the archaeological information was still valid and of value for this study.

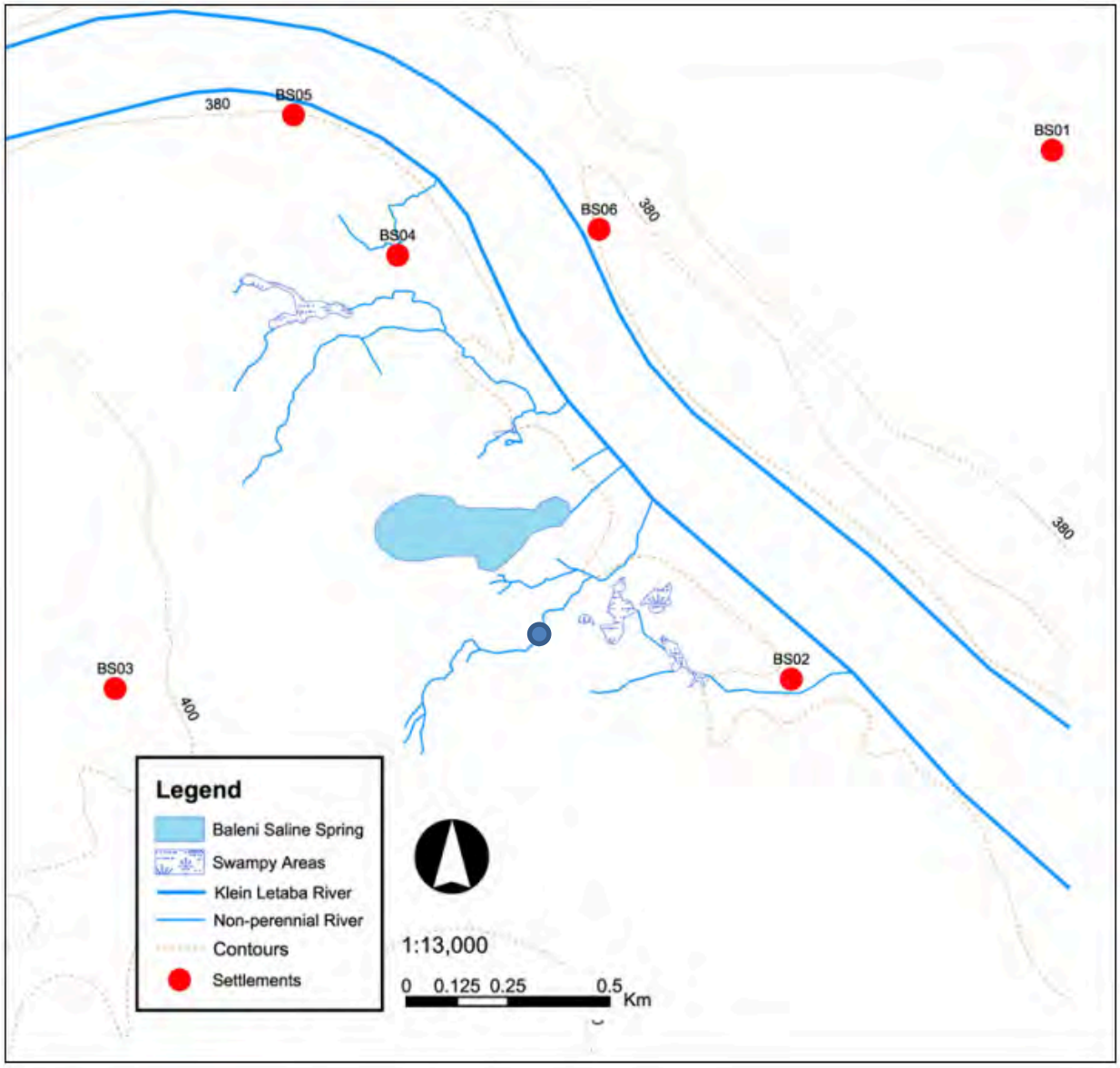


Figure 25. Sites identified by Antonites - BS02 location is incorrect (A Antonites, 2005) – Site 1 in Blue

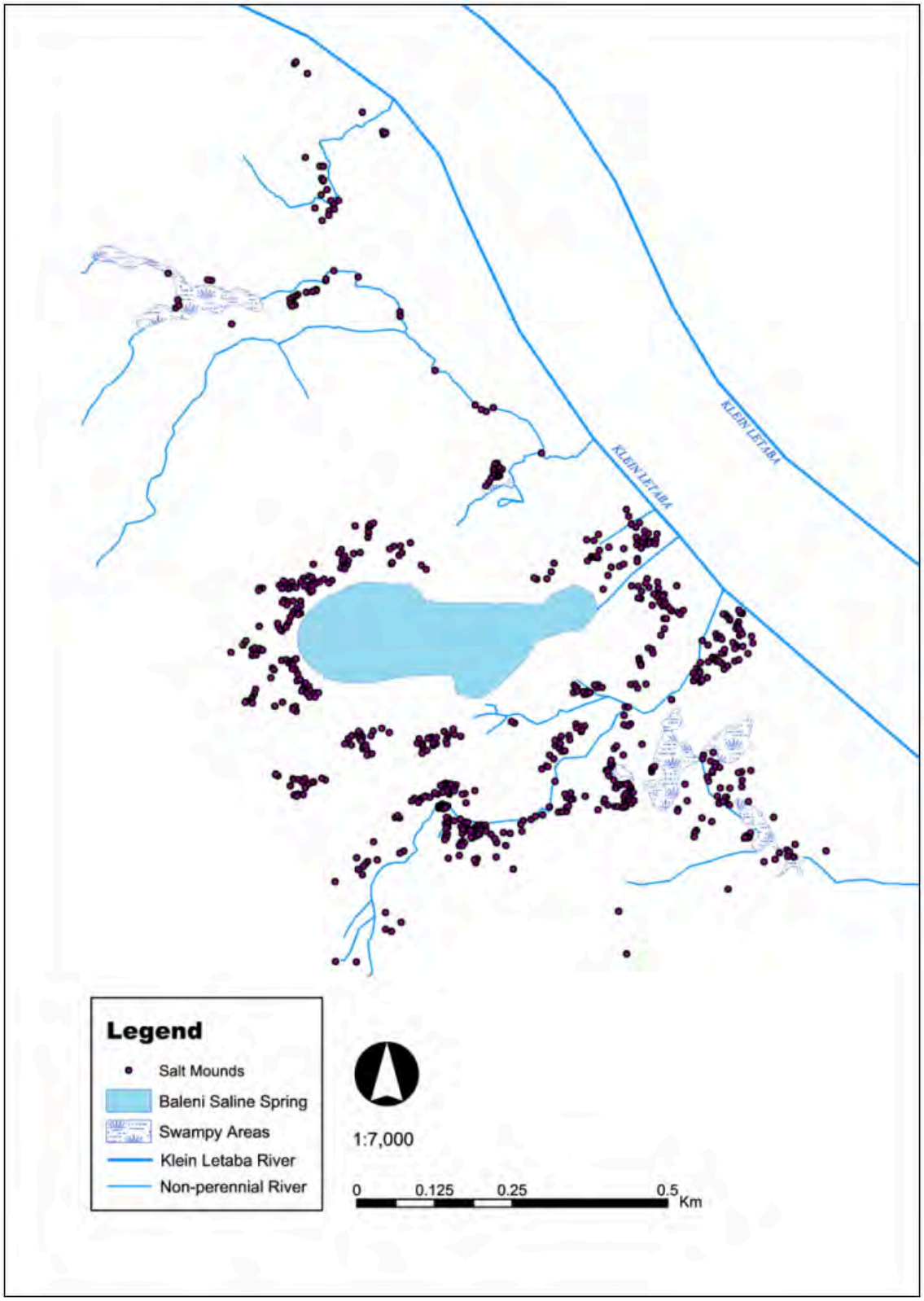


Figure 26. Locations of what is referred to as "Salt Mounds"- some of which was found to be hut remains (A Antonites 2005)

The following is an abstract from the Antonites report. It refers to BS04, however (taking the glaring similarities between the two sites) it was meant to describe site BS02 or Site 1 as per this report;

BS04

This site was identified by the presence of ceramic scatters and daga. A deep donga seems to have cut through the biggest part of the site, since material was found on both edges of it, and not extending very far back. The extensive erosion made it difficult to determine the approximate size of the settlement.

Estimates indicate that it did not exceed 2000m2. Preliminary analysis of the surface ceramics indicated that the site was occupied during the early first millennium. Leached out mounds of earth, possibly from a later date, were also identified on the edge of the donga. This led to the decision to excavate test pits in order to obtain ceramics which could be used for a more detailed temporal context for the settlement. (Antonites, 2005).

We believe the subsequent excavations designated as BAL 01 (unfortunately no GPS coordinates or 1:50 000 references are given for these excavations) refer to Site 1. The photographs contained in the report also seem to corroborate this.

Figure 27. Exposed wall at Site 1

Figure 28. Eroded wall from Antonites Report (Antonites, 2005)

Figure 29. Archaeological Stratigraphy from Antonites Excavation (Antonites 2005)

Figure 30. Salt Mounds as described by Antonites, rather thought to be hut remains

4.1.2. Site 2

GPS 23°25'15,2" S
30°54'31,1" E

Figure 31. Grave Site

A single grave site was also identified; however, it is not expected to be impacted upon. The site should be avoided by at least 25m.

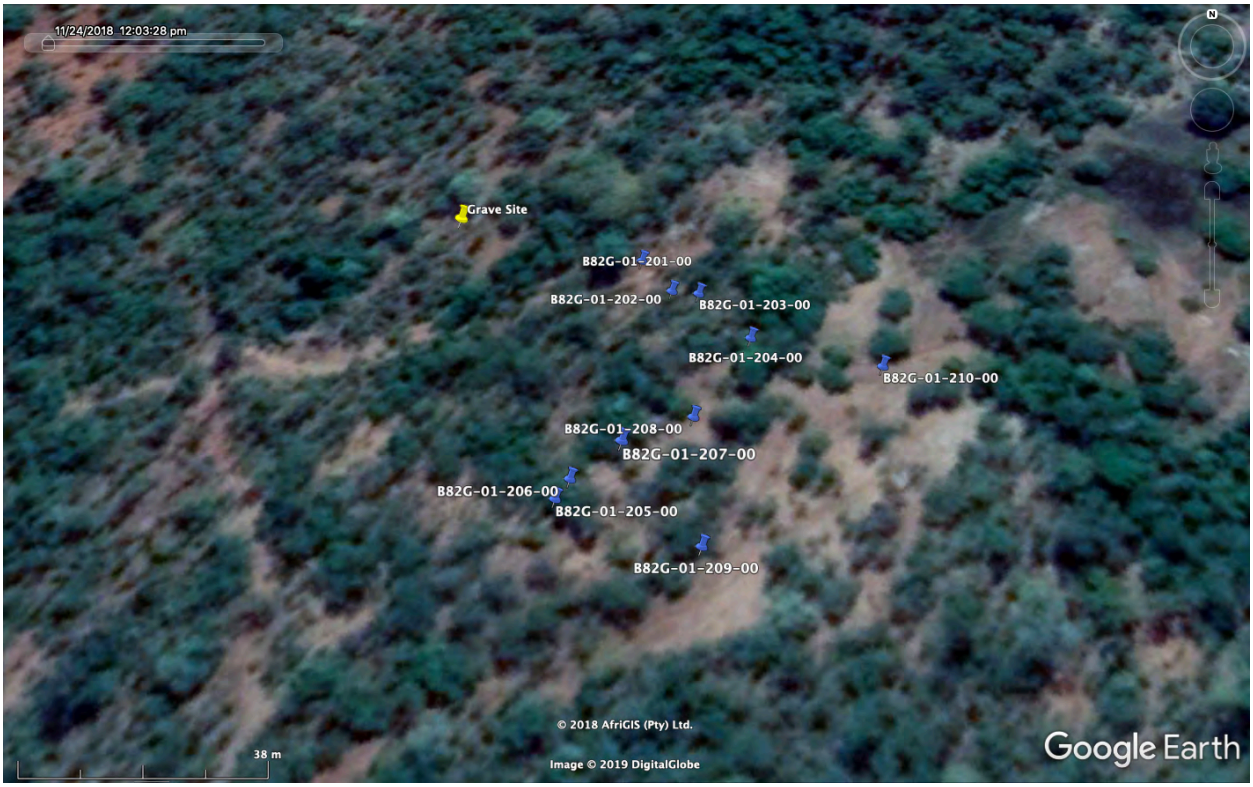


Figure 32. Location of Grave Site

4.2 Public Participation

As part of the heritage orientated public participation the following steps were taken to inform local residents of the planned development.

- Notices indicating the location of the rehabilitation interventions were placed on site (See Addendum 1).
- IAP's were invited to register through the lead consultant's public participation process, to facilitate the dissemination of information and to enable them to log any queries or complains in regards the heritage of the are and how it will be affected by the proposed rehabilitation interventions.
- This HIA will be made available for public comment as part of the broader EIA report for this project.
- If a ROD in terms of the NHRA is issued for the project, IAP's will be informed of their right to log complaints within 14 days.
- Letters informing IAP's of the BAR will be circulated by the lead consultant.
- As part of the wider EIA stakeholder engagement component, advertisements regarding the development was placed in local newspapers by the lead consultant.

Chapter 3

IMPACT ASSESSMENT

5. METHODOLOGY

This study defines the heritage component of the EIA process being undertaken for the proposed anti-erosion measures recommended by the Working for Water engineers to limit the impact of water flow off at the wetlands around Baleni, Limpopo Province.

It is described as a first phase (HIA). This report attempts to evaluate both the accumulated heritage knowledge of the area as well as information derived from direct physical observations.

5.1 INVENTORY

Inventory studies involve the in-field survey and recording of archaeological resources within a proposed altering action and buffer area. The nature and scope of this type of study is defined primarily by the results of the overview study. In the case of site-specific actions, direct implementation of an inventory study may preclude the need for an overview.

There are a number of different methodological approaches to conducting inventory studies. Therefore, the proponent, in collaboration with the archaeological consultant, must develop an inventory plan for review and approval by the SAHRA prior to implementation (*Dincause, Dena F., H. Martin Wobst, Robert J. Hasenstab and David M. Lacy 1984)*.

5.2 EVALUATING HERITAGE IMPACTS

A combination of document research as well as the determination of the geographic suitability of areas and the evaluation of aerial photographs determined which areas could and should be accessed.

After plotting of the site on a GPS the areas were accessed using suitable combinations of vehicle access and access by foot.

Sites were documented by digital photography and geo-located with GPS readings using the WGS 84 datum.

Further techniques (where possible) included interviews with local inhabitants, visiting local museums and information centers and discussions with local experts. All this information was combined with information from an extensive literature study as well as the result of archival studies based on the SAHRA (South African Heritage Resource Agency) provincial databases.

This Heritage Impact Assessment relies on the analysis of written documents, maps, aerial photographs and other archival sources combined with the results of site investigations and interviews with effected people. Site investigations are not exhaustive and often focus on areas such as river confluence areas, elevated sites or occupational ruins.

The following sources were consulted in this study;

- South African National Archive Documents
- Government Gazette 92 of 2007
- SAHRIS (South African Heritage Resources Information System) Database of Heritage Studies
- Internet search
- Historic maps
- 1967, 1980, 1997 & 2008 Surveyor General Topographic Map series
- 1952 1:10 000 aerial photo survey
- Google Earth 2018 imagery
- Published articles and books
- JSTOR Article Archive

5.3 Fieldwork

Fieldwork for this study was performed on the 21th of August 2018. Most of the areas were found to be accessible by vehicle. Areas of possible significance were investigated on foot. The survey was tracked using GPS and a track file in GPX format is available on request.

Where sites were identified it was documented photographically and plotted using GPS with the WGS 84 datum point as reference. GPX files are available on request from G&A Heritage.

The study area was surveyed using standard archaeological surveying methods. The area was surveyed using directional parameters supplied by the GPS and surveyed by foot. This technique has proven to result in the maximum coverage of an area. This action is defined as;

'an archaeologist being present in the course of the carrying-out of the development works (which may include conservation works), so as to identify and protect archaeological deposits, features or objects which may be uncovered or otherwise affected by the works' (DAHGI 1999a, 28).

Standard archaeological documentation formats were employed in the description of sites. Using standard site documentation forms as comparable medium, it enabled the surveyors to evaluate the relative importance of sites found. Furthermore, GPS (Global Positioning System) readings of all finds and sites were taken. This information was then plotted using a ***Garmin Colorado*** GPS (WGS 84- datum).

Indicators such as surface finds, plant growth anomalies, local information and topography were used in identifying sites of possible archaeological importance. Test probes were done at intervals to determine sub-surface occurrence of archaeological material. The importance of sites was assessed by comparisons with published information as well as comparative collections.

6. Assessment of Heritage Potential

6.1 Assessment Matrix

6.1.1 Determining the Archaeological Significance

In addition to guidelines provided by the National Heritage Resources Act (Act No. 25 of 1999), a set of criteria based on Whitelaw (1997) for assessing archaeological significance has been developed for Eastern Cape settings but also applies to other provinces. These criteria include estimation of landform potential (in terms of its capacity to contain archaeological traces) and assessing the value to any archaeological traces (in terms of their attributes or their capacity to be construed as evidence, given that evidence is not given but constructed by the investigator).

Estimating site potential

Table 1 (below) is a classification of landforms and visible archaeological traces used for estimating the potential of archaeological sites (after J. Deacon and, National Monuments Council). Type 3 sites tend to be those with higher archaeological potential, but there are notable exceptions to this rule, for example the renowned rock engravings site Driekopseiland near Kimberley which is on landform L1 Type 1 – normally a setting of lowest expected potential. It should also be noted that, generally, the older a site the poorer the preservation, so that sometimes any trace, even of only Type 1 quality, could be of exceptional significance. In light of this, estimation of potential will always be a matter for archaeological observation and interpretation.

Table 3. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deaon, NMC as used in Morris)

Class	Landform	Type 1	Type 2	Type 3
L1	Rocky Surface	Bedrock exposed	Some soil patches	Sandy/grassy patches
L2	Ploughed land	Far from water	In floodplain	On old river terrace
L3	Sandy ground, inland	Far from water	In floodplain or near features such as	On old river terrace

			hill/dune	
L4	Sandy ground, coastal	>1 km from sea	Inland of dune cordon	Near rocky shore
L5	Water-logged deposit	Heavily vegetated	Running water	Sedimentary basin
L6	Developed urban	Heavily built-up with no known record of early settlement	Known early settlement, but buildings have basements	Buildings without extensive basements over known historical sites
L7	Lime/dolomite	>5 myrs	<5000 yrs	Between 5000 yrs and 5 myrs
L8	Rock shelter	Rocky floor	Loping floor or small area	Flat floor, high ceiling
Class	Archaeological traces	Type 1	Type 2	Type 3
A1	Area previously excavated	Little deposit remaining	More than half deposit remaining	High profile site
A2	Shell of bones visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick; shell and bone dense
A3	Stone artefacts or stone walling or other feature visible	Dispersed scatter	Deposit <0.5m thick	Deposit >0.5 m thick

Table 4. Site attributes and value assessment (adopted from Whitelaw 1997 as used in Morris)

Class	Landforms	Type 1	Type 2	Type 3
1	Length of sequence /context	No sequence Poor context Dispersed distribution	Limited sequence	Long sequence Favourable context High density of arte / ecofacts
2	Presence of exceptional items (incl. regional rarity)	Absent	Present	Major element
3	Organic preservation	Absent	Present	Major element
4	Potential for future archaeological investigation	Low	Medium	High
5	Potential for public display	Low	Medium	High
6	Aesthetic appeal	Low	Medium	High
7	Potential for implementation of a long-term management plan	Low	Medium	High

6.2 Assessing site value by attribute

Table 2 is adapted from Whitelaw (1997), who developed an approach for selecting sites meriting heritage recognition status in KwaZulu Natal which is now widely used in most provinces. It is a means of judging a site's archaeological value by ranking the relative strengths of a range of attributes (given in the second column of the table). While aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general archaeological significance of a site, with Type 3 attributes being those of highest significance.

6.3 Impact Statement

6. 3.1 Assessment of Impacts

A heritage resource impact may be broadly defined as the net change between the integrity of a heritage site with and without the proposed activities. This change may be either beneficial or adverse.

Beneficial impacts occur wherever a proposed activity actively protects, preserves or enhances a heritage resource. For example, development may have a beneficial effect by preventing or lessening natural site erosion. Similarly, an action may serve to preserve a site for future investigation by

covering it with a protective layer of fill. In other cases, the public or economic significance of an archaeological site may be enhanced by actions, which facilitate non-destructive public use. Although beneficial impacts are unlikely to occur frequently, they should be included in the assessment.
More commonly, the effects of a project on heritage sites are of an adverse nature. Adverse impacts occur under conditions that include:
(a) destruction or alteration of all or part of a heritage site;
(b) isolation of a site from its natural setting; and
(c) introduction of physical, chemical or visual elements that are out-of-character with the heritage resource and its setting.

Adverse effects can be more specifically defined as direct or indirect impacts. Direct impacts are the immediately demonstrable effects of a project which can be attributed to particular land modifying actions. They are directly caused by a project or its ancillary facilities and occur at the same time and place. The immediate consequences of a project action, such as slope failure following reservoir inundation, are also considered direct impacts.
Indirect impacts result from activities other than actual project actions. Nevertheless, they are clearly induced by a project and would not occur without it. For example, project development may induce changes in land use or population density, such as increased urban and recreational development, which may indirectly impact upon heritage sites. Increased vandalism of heritage sites, resulting from improved or newly introduced access, is also considered an indirect impact. Indirect impacts are much more difficult to assess and quantify than impacts of a direct nature.
Once all project related impacts are identified, it is necessary to determine their individual level-of-effect on heritage resources. This assessment is aimed at determining the extent or degree to which future opportunities for scientific research, preservation, or public appreciation are foreclosed or otherwise adversely affected by a proposed action. Therefore, the assessment provides a reasonable indication of the relative significance or importance of a particular impact. Normally, the assessment should follow site evaluation since it is important to know what heritage values may be adversely affected.

The assessment should include careful consideration of the following level-of-effect indicators, which are defined below:

- magnitude
- severity
- duration
- range
- frequency
- diversity
- cumulative effect
- rate of change

6.4 Indicators of Impact Severity

Magnitude
The amount of physical alteration or destruction, which can be expected. The resultant loss of heritage value is measured either in amount or degree of disturbance.

Severity
The irreversibility of an impact. Adverse impacts, which result in a totally irreversible and irretrievable loss of heritage value, are of the highest severity.

Duration
The length of time an adverse impact persists. Impacts may have short-term or temporary effects, or conversely, more persistent, long-term effects on heritage sites.

Range
The spatial distribution, whether widespread or site-specific, of an adverse impact.

Frequency
The number of times an impact can be expected. For example, an adverse impact of variable magnitude and severity may occur only once. An impact such as that resulting from cultivation may be of recurring or on-going nature.

Diversity
The number of different kinds of project-related actions expected to affect a heritage site.

Cumulative Effect
This describes the cumulative effect of the impacts on the heritage parameter. A cumulative effect/impact is an effect, which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.

Rate of Change
The rate at which an impact will effectively alter the integrity or physical condition of a heritage site. Although an important level-of-effect indicator, it is often difficult to estimate. Rate of change is normally assessed during or following project construction.

The level-of-effect assessment should be conducted and reported in a quantitative and objective fashion. The methodological approach, particularly the system of ranking level-of-effect indicators, must be rigorously documented and recommendations should be made with respect to managing uncertainties in the assessment. *(Zubrow, Ezra B.A., 1984).*

6.5 Pre-Contact Sites
As discussed in Findings – Chapter 2

6.6 Post-Contact Sites
No sites associated with the post-contact era will be affected by the proposed actions.

6.7 Built Environment
No structures were identified on site.

7. Impact Evaluation
This HIA Methodology assists in evaluating the overall effect of a proposed activity on the heritage environment. The determination of the effect of a heritage impact on a heritage parameter is determined through a systematic analysis of the various components of the impact. This is undertaken using information that is available to the heritage practitioner through the process of heritage impact assessment. The impact evaluation of predicted impacts was undertaken through an assessment of the significance of the impacts.

7.1 Determination of Significance of Impacts
Significance is determined through a synthesis of impact characteristics, which include context and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity if the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

7.2 Impact Rating System

An impact assessment must take account of the nature, scale and duration of effects on the heritage environment whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the project stages:

- planning
- construction
- operation
- decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact will be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

7.2.1 Rating System Used to Classify Impacts

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact. Impacts have been consolidated into one rating. In assessing the significance of each issue the following criteria (including an allocated point system) is used:

Table 5. Classification of Impacts

NATURE		
Including a brief description of the impact of the heritage parameter being assessed in the context of the project. This criterion includes a brief written statement of the heritage aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY		
This describes the degree to which an impact on a heritage parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.

2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which heritage resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION		
This describes the duration of the impacts on the heritage parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts on the heritage parameter. A cumulative effect/impact is an effect, which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible Cumulative Impact	The impact would result in negligible to no cumulative effects.
2	Low Cumulative Impact	The impact would result in insignificant cumulative effects.

3	Medium Cumulative impact	The impact would result in minor cumulative effects.
4	High Cumulative Impact	The impact would result in significant cumulative effects.
INTENSITY / MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the heritage parameter. The calculation of the significance of an impact uses the following formula: **(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.** The summation of the different criteria will produce a non weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	**Impact Significance Rating**	**Description**
6 to 28	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive Low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive Medium impact	The anticipated impact will have moderate positive effects.

51 to 73	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive High impact	The anticipated impact will have significant positive effects.
74 to 96	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive Very high impact	The anticipated impact will have highly significant positive effects.

8. Anticipated Impact of the Actions

8.1 Iron Age Deposit Site (Site 1)

Interventions are being proposed to minimize further erosion. Although this will stabilise the archaeological deposit it will necessitate cutting into the existing deposits. The resultant structure will however be beneficial to downstream archaeological sites.

Table 6. Mitigation of Impacts: *Site 1*

IMPACT TABLE FORMAT		
Heritage component	*Iron Age Deposit Site (Site 1)*	
Issue/Impact/Heritage Impact/Nature	*Heritage sites of significance: Iron Age*	
Extent	*Provincial (3)*	
Probability	*Likely (3)*	
Reversibility	*Irreversible (4)*	
Irreplaceable loss of resources	*Significant loss of resources (3)*	
Duration	*Medium term (2)*	
Cumulative effect	*High cumulative effect (3)*	
Intensity/magnitude	*High (3)*	
Significance Rating of Potential Impact	*54 points. The impact will have a negative impact rating.*	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	3	2
Probability	3	1
Reversibility	4	2
Irreplaceable loss	3	1
Duration	2	2
Cumulative effect	3	1
Intensity/magnitude	3	1
Significance rating	54 (medium negative)	9 (low negative)
Mitigation measure	*It is suggested that the proposed cutting be subjected to a second phase of investigation and that a professional*	

	archaeological excavation be performed under a permit issued by the SAHRA.

8.2 Fence Line

Table 12. Mitigation of Impacts: *Fence Line*

IMPACT TABLE FORMAT		
Heritage component	*Unidentified sites*	
Issue/Impact/Heritage Impact/Nature	*Heritage sites of significance: Fence Line*	
Extent	*Local/district (2)*	
Probability	*Unlikely (1)*	
Reversibility	*Partly reversible (2)*	
Irreplaceable loss of resources	*No loss of resource. (1)*	
Duration	*Medium term (2)*	
Cumulative effect	*Low cumulative effect (1)*	
Intensity/magnitude	*Low (1)*	
Significance Rating of Potential Impact	*9 points. The impact will have a low negative impact rating.*	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	1	1
Reversibility	2	2
Irreplaceable loss	1	1
Duration	2	2
Cumulative effect	1	1
Intensity/magnitude	1	1
Significance rating	9 (low negative)	9 (low negative)
Mitigation measure	*The fence line will be a low impact activity which will be placed within the wetland area and will not impact on the heritage of the site.*	

8.3 Grave Site

Table 13. Mitigation of Impacts: *Grave Site*

IMPACT TABLE FORMAT	
Heritage component	*Iron Age Deposit Site*
Issue/Impact/Heritage Impact/Nature	*Heritage sites of significance: Iron Age*
Extent	*Local/district (2)*
Probability	*Possible (2)*
Reversibility	*Barely reversible (3)*
Irreplaceable loss of resources	*Significant loss of resources (3)*

Duration	*Medium term (2)*	
Cumulative effect	*High cumulative effect (3)*	
Intensity/magnitude	*High (3)*	
Significance Rating of Potential Impact	*45 points. The impact will have a negative impact rating.*	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	2	1
Reversibility	3	2
Irreplaceable loss	3	1
Duration	2	2
Cumulative effect	3	1
Intensity/magnitude	3	1
Significance rating	45 (medium negative)	9 (low negative)
Mitigation measure	*The grave site should be avoided by at least 25m buffer zone during the construction phase.*	

10. Chance Finds Protocol

Although unlikely, sub-surface remains of heritage sites could still be encountered during the construction activities associated with the project. Such sites would offer no surface indication of their presence due to the high state of alterations in some areas as well as heavy plant cover in other areas. The following indicators of unmarked sub-surface sites could be encountered:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;
- Ceramic fragments such as pottery shards either historic or pre-contact as per Chapter 2;
- Stone concentrations of any formal nature.

Figure 33. Photos curtesy of EON Hanisch

- The following recommendations are given should any sub-surface remains of heritage sites be identified as indicated above:
- All excavators should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered.
- All construction in the immediate vicinity (50m radius of the site) should cease.
- The heritage practitioner should be informed as soon as possible.
- In the event of obvious human remains the South African Police Services (SAPS) should be notified.
- Mitigation measures (such as refilling etc.) should not be attempted.
- The area in a 50m radius of the find should be cordoned off with hazard tape.
- Public access should be limited.
- Should human remains be uncovered it is important that the site be secured until such time as the SAPS and the heritage consultant can access the site.
- No media statements should be released until such time as the heritage practitioner has had sufficient time to analyze the finds.

11. Conclusion

Although several sites of heritage value are located within the study area, only one site will be directly affected by the proposed anti-erosion measures, namely intervention B82G-01-213-00.

It is recommended that the proposed site be subjected to an archaeological excavation permitted by the SAHRA. Should the WFW monitoring show any new erosion or flow deviations that could impact on heritage sites, a heritage practitioner should be approached to evaluate the impact.

Due to the limited impact of the activity proposed, there are no direct heritage impacts on the local community and it is accepted that the public participation process performed by the lead consultant will be sufficient.

12. References Cited & Researched

Ahler, S.A. 1977. Functional analysis of nonobsidian chipped stone artefacts: terms, variables and quantification. In: Hayden, B. (ed.). Lithic use-wear analysis: 301-328. New York: Academic Press.

Greenfield, H. J. and van Schalkwyk, L. O. 2003. Intr a- settlement social and economic organization of Early Iron Age farming communities in southern Africa: view from Ndondondwane. Azania, 38: 121-37.

Huffman, T. N. 1993. Broederstroom and the Central Cattle Pattern. South African Journal of Science, 89: 220-26.

Huffman, T. N. 2001. The Central Cattle Pattern and interpreting the past. Southern African Humanities, 13: 19-35.

Kent, S. 1998. Invisible gender-invisible foragers: hunter-gatherer spatial patterning and the southern African archaeological record. In: Kent, S. (ed.) Gender in African prehistory: 39-67. California: Altamira Press.

Japha, D., Japha, V., Le grange, L & Todeschini, F. Mission Settlements in South Africa: A Report on their historical background and prospects for conservation. University of Cape Town.

Maggs, T. O. 1984c. The Iron Age south of the Zambezi. In Southern African Prehistory and Paleoenvironments (ed. R. Klein). Rotterdam: Balken, pp. 329-60.

Maggs, T. O. 1995. The Early Iron Age in the extreme south: some patterns and problems. Azania, 29/30: 171-8.

Bewsher, P K, & De Jong, R C, (1997), Ecotourism and cultural resource management. Document prepared for the SA Wildlife College. Pretoria: Centre for Ecotourism.

Department of Arts, Culture, Science and Technology, (1996). White Paper on Arts, Culture and Heritage. Pretoria: SA Communication Service.

DEAT, (1996). White Paper on the Development and Promotion of Tourism in South Africa. Pretoria: The Department.

DEAT, (1998). A national strategy for Integrated Environmental Management in South Africa. Discussion document. Pretoria: The Department.

DEAT, (1998). White Paper on environmental management policy for South Africa. Government Gazette, Vol 395, No 18894, 15 May 1998.

Department of Public Works, (1998), White Paper 1997. Public Works towards the 21st century.

Government Gazette, Vol 391, No 18616, 14 January 1998.

Cultural Heritage 146 Ekurhuleni SoER 2003.

Entries on towns in the Standard Encyclopedia of Southern Africa, published by Nasou, 1970-1976 (11 volumes).

Hall, C.M, & McArthur, S. (eds), (1996). Heritage management in Australia and New Zealand. Draft publication.

Harrison, R, (1994). Manual of heritage management. Oxford: Butterworth Heinemann.

Jote, K, (1994). International legal protection of cultural heritage. Stockholm: Juristförlaget.

Killick, D. 2004. Review Essay: "What Do We Know About African Iron Working?" Journal of African Archaeology. Vol 2 (1) pp. 135–152

McCarthy, T.S. 2006. The Witwatersrand Supergroup. In: Johnson MR, Anhaeusser and Thomas RJ (Eds). The Geology of South Africa. Geological Society of South Africa, Johannesburg/Council for Geoscience, Pretoria. pp 155-186.

McCarthy, T.S. and Rubidge, B.S. 2005. The story of Earth and Life – a southern African perspective on the 4.6 billion year journey. Struik Publishers, Cape Town. pp 333.

Mason, R. (1986). Origins of Black People of Johannesburg and the Southern Western Central Transvaal AD350-1880. Occasional Paper No. 16 of the Archaeological Research Unit.

Musa, (1994). Museums for South Africa: Intersectoral investigation for national policy.Pretoria: MUSA Secretariat.

National Heritage Council Act, No 11 of 1999.

National Heritage Resources Act, No 25 of 1999.

National Research Foundation, Nexus database of current and completed research projects.

Republic of South Africa, (1996). Constitution of the Republic of South Africa, Act 108 of 1996. Government Gazette, Vol 378, No 17678, 18 December 1996.

Ross, M. (1996). Planning and the heritage. Policy and procedures. Second edition. London:E &FN Spon.
SAHRA website http://www.sahra.org.za

Stark, F, (1986). Germiston: The heart of South Africa. Germiston: Felstar Publishing.

UNESCO, (1983). Conventions and recommendations concerning the protection of the cultural heritage. Paris: UNESCO.

US National Parks Service, (1988). Management Policies.

Whitelaw, G. 1997. Archaeological monuments in KwaZulu-Natal: a procedure for the identification of value. Natal Museum Journal of Humanities. 9:99-109.

Addendum 1
Measuring Impacts

Measuring Impacts

In 2003 the SAHRA compiled the following guidelines to evaluate the cultural significance of individual heritage resources:

1 Type of Resource

- Place
- Archaeological Site
- Structure
- Grave
- Paleontological Feature
- Geological Feature

2 Type of Significance

2.1 Historic Value

It is important in the community, or pattern of history

o Important in the evolution of cultural landscapes and settlement patterns

o Important in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, province, region or locality.

o Important for association with events, developments or cultural phases that have had a significant role in the human occupation and evolution of the nation, province, region or community.

o Important as an example for technical, creative, design or artistic excellence, innovation or achievement in a particular period.

It has strong or special association with the life or work of a person, group or organisation of importance in history

o Importance for close associations with individuals, groups or organisations whose life, works or activities have been significant within the history of the nation, province, region or community.

It has significance relating to the history of slavery

o Importance for a direct link to the history of slavery in South Africa.

2.2 Aesthetic Value

It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group.

o Important to a community for aesthetic characteristics held in high esteem or otherwise valued by the community.

o Importance for its creative, design or artistic excellence, innovation or achievement.

o Importance for its contribution to the aesthetic values of the setting demonstrated by a landmark quality or having impact on important vistas or otherwise contributing to the identified aesthetic qualities of the cultural environs or the natural landscape within which it is located.

o In the case of an historic precinct, importance for the aesthetic character created by the individual components which collectively form a significant streetscape, townscape or cultural environment.

2.3 Scientific Value

It has potential to yield information that will contribute to an understanding of natural or cultural heritage

o Importance for information contributing to a wider understanding of natural or cultural history by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.

o Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.

o Importance for information contributing to a wider understanding of the origin of life; the development of plant or animal species, or the biological or cultural development of hominid or human species.

o Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the nation, Province, region or locality.

o It is important in demonstrating a high degree of creative or technical achievement at a particular period

o Importance for its technical innovation or achievement.

(a) Does the site contain evidence, which may substantively enhance understanding of culture history, culture process, and other aspects of local and regional prehistory?

- internal stratification and depth
- chronologically sensitive cultural items
- materials for absolute dating
- association with ancient landforms
- quantity and variety of tool type
- distinct intra-site activity areas
- tool types indicative of specific socio-economic or religious activity
- cultural features such as burials, dwellings, hearths, etc.
- diagnostic faunal and floral remains
- exotic cultural items and materials
- uniqueness or representativeness of the site
- integrity of the site

(b) Does the site contain evidence which may be used for experimentation aimed at improving archaeological methods and techniques?

- monitoring impacts from artificial or natural agents
- site preservation or conservation experiments
- data recovery experiments
- sampling experiments

- intra-site spatial analysis

(c) Does the site contain evidence which can make important contributions to paleoenvironmental studies?

- topographical, geomorphological context
- depositional character
- diagnostic faunal, floral data

(d) Does the site contain evidence which can contribute to other scientific disciplines such as hydrology, geomorphology, pedology, meteorology, zoology, botany, forensic medicine, and environmental hazards research, or to industry including forestry and commercial fisheries?

2.4 Social Value / Public significance

- It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- Importance as a place highly valued by a community or cultural group for reasons of social, cultural, religious, spiritual, symbolic, aesthetic or educational associations.
- Importance in contributing to a community's sense of place.

(a) Does the site have potential for public use in an interpretive, educational or recreational capacity?

- integrity of the site
- technical and economic feasibility of restoration and development for public use
- visibility of cultural features and their ability to be easily interpreted
- accessibility to the public

- opportunities for protection against vandalism
- representativeness and uniqueness of the site
- aesthetics of the local setting
- proximity to established recreation areas
- present and potential land use
- land ownership and administration
- legal and jurisdictional status
- local community attitude toward development

(b) Does the site receive visitation or use by tourists, local residents or school groups?

2.5 Ethnic Significance

(a) Does the site presently have traditional, social or religious importance to a particular group or community?

- ethnographic or ethno-historic reference
- documented local community recognition or, and concern for, the site

2.6 Economic Significance

(a) What value of user-benefits may be placed on the site?

- visitors' willingness-to-pay
- visitors' travel costs

2.7 Scientific Significance

(a) Does the site contain evidence, which may substantively enhance understanding of historic patterns of settlement and land use in a particular locality, regional or larger area?

(b) Does the site contain evidence, which can make important contributions to other scientific disciplines or industry?

2.8 Historic Significance

(a) Is the site associated with the early exploration, settlement, land use, or other aspect of southern Africa's cultural development?

(b) Is the site associated with the life or activities of a particular historic figure, group, organization, or institution that has made a significant contribution to, or impact on, the community, province or nation?

(c) Is the site associated with a particular historic event whether cultural, economic, military, religious, social or political that has made a significant contribution to, or impact on, the community, province or nation?

(d) Is the site associated with a traditional recurring event in the history of the community, province, or nation, such as an annual celebration?

2.9 Public Significance

(a) Does the site have potential for public use in an interpretive, educational or recreational capacity?

- visibility and accessibility to the public
- ability of the site to be easily interpreted
- opportunities for protection against vandalism
- economic and engineering feasibility of reconstruction, restoration and maintenance
- representativeness and uniqueness of the site
- proximity to established recreation areas
- compatibility with surrounding zoning regulations or land use
- land ownership and administration
- local community attitude toward site preservation, development or destruction
- present use of site

(b) Does the site receive visitation or use by tourists, local residents or school groups?

2.10 Other

(a) Is the site a commonly acknowledged landmark?

(b) Does, or could, the site contribute to a sense of continuity or identity either alone or in conjunction with similar sites in the vicinity?

(c) Is the site a good typical example of an early structure or device commonly used for a specific purpose throughout an area or period of time?

(d) Is the site representative of a particular architectural style or pattern?

3 Degrees of Significance

3.1 Significance Criteria

There are several kinds of significance, including scientific, public, ethnic, historic and economic, that need to be taken into account when evaluating heritage resources. For any site, explicit criteria are used to measure these values. These checklists are not intended to be exhaustive or inflexible. Innovative approaches to site evaluation which emphasize quantitative analysis and objectivity are encouraged. The process used to derive a measure of relative site significance must be rigorously documented, particularly the system for ranking or weighting various evaluated criteria.

Site integrity, or the degree to which a heritage site has been impaired or disturbed as a result of past land alteration, is an important consideration in evaluating site significance. In this regard, it is important to recognize that although an archaeological site has been disturbed, it may still contain important scientific information.

Heritage resources may be of scientific value in two respects. The potential to yield information, which, if properly recovered, will enhance understanding of Southern African human history, is one appropriate measure of scientific significance. In this respect, archaeological sites should be evaluated in terms of their potential to resolve current archaeological research problems. Scientific significance also refers to the potential for relevant contributions to other academic disciplines or to industry.

Public significance refers to the potential a site has for enhancing the public's understanding and appreciation of the past. The interpretive, educational and recreational potential of a site are valid indications of public value. Public significance criteria such as ease of access, land ownership, or scenic setting are often external to the site itself. The relevance of heritage resource data to private industry may also be interpreted as a particular kind of public significance.

Ethnic significance applies to heritage sites which have value to an ethnically distinct community or group of people. Determining the ethnic significance of an archaeological site may require consultation with persons having special knowledge of a particular site. It is essential that ethnic significance be assessed by someone properly trained in obtaining and evaluating such data.

Historic archaeological sites may relate to individuals or events that made an important, lasting contribution to the development of a particular locality or the province. Historically important sites also reflect or commemorate the historic socioeconomic character of an area. Sites having high historical value will also usually have high public value.

The economic or monetary value of a heritage site, where calculable, is also an important indication of significance. In some cases, it may be possible to project monetary benefits derived from the public's use of a heritage site as an educational or recreational facility. This may be accomplished by employing established economic evaluation methods; most of which have been developed for valuating outdoor recreation. The objective is to determine the willingness of users, including local residents and tourists, to pay for the experiences or services the site provides even though no payment is presently being made. Calculation of user benefits will normally require some study of the visitor population (Smith, L.D. 1977).

3.2 Rarity

It possesses uncommon, rare or endangered aspects of natural or cultural heritage.

- Importance for rare, endangered or uncommon structures, landscapes or phenomena.

3.3 Representivity

- It is important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects.
- Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class.
- Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Nokukhanya Khumalo
Tel: 021 462 4502
Email: nkhumalo@sahra.org.za
CaseID: 13451

Final Comment

In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999)

Attention: Dr Farai Tererai
Working for Wetlands Programme

Working for Wetlands (WfWetlands) is a government programme mandated to protect pristine wetlands, promote their wise-use and rehabilitate those that are damaged throughout South Africa, with an emphasis on complying with the principles of the Expanded Public Works Programme (EPWP) and using only local Small, Medium and Micro Enterprises (SMMEs).Due to the nature of the project, it is important to note that the very objectives of the WfWetlands Programme are to improve both environmental and social circumstances

Working for Wetlands is proposing to rehabilitate the wetland area within the Baleni nature reserve located in the Greater Giyane Local Municipality of the Limpopo Province. They plan on accomplishing this by constructing weirs/gabions that will create a barrier that will allow for sedimentation build-up to slow the water flow and re-wet the wetland area. There will be 28 intervention areas in the wetland including a 325m cattle fence.

Aurecon South Africa (Pty) Ltd is undertaking a Basic Assessment process on behalf of Working for Wetlands, in respect of listed activities in the Environmental Impact Assessment (EIA) Regulations 2014, as amended, that require an application for Environmental Authorisation, in terms of the National Environmental Management Act, 1998 (NEMA), as amended.

To meet the requirements of section 38(8) of the National Heritage Resources Act, no 25 of 1999, a Heritage Impact Assessment (HIA) Report by G&A Heritage Management Consultants (Pty) Ltd had been submitted to South African Heritage Resources Agency (SAHRA) for commenting on 11/02/2019. In an Interim Comment issued on 18/03/2019, SAHRA summarised the HIA report as follows:

Gaigher, S. December 2018. Phase 1 Heritage Impact Assessment Report for the Proposed Anti-Erosion Measures at the Baleni Salt Works Provincial Heritage Site, Limpopo Province.

The author undertook a field assessment of the proposed wetland area and identified two heritage sites that may be impacted by the proposed intervention areas. The first site, Site 1 in the HIA is the same site that was described in a Masters research paper as site BS04; it consists of hut floor remains, ash deposits, and

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

potsherds of which some are diagnostic. This site will be partially impacted by trenching to install intervention measures to curb continued erosion. The author assessed the disturbance as beneficial to the long conservation of other archaeological sites downstream.

The second site, Site 2 is a single grave site located outside the proposed rehabilitation intervention areas. Both sites are of high heritage significance. As well as all other sites located within the entire wetland area is the Baleni Salt-works as it is a Provincial Heritage Site (PHS).

The author recommends:

No assessment of impacts on palaeontological resources because the study area is located in the grey zone in the SAHRA palaeo-map.

Site 1 must be mitigated by a qualified archaeologist in the area that will be disturbed by the installation of a gabions at Intervention B82G-01-213-00. In order to carry out the mitigations, a section 35 of the NHRA permit application must be applied for to SAHRA.

The cemetery must be protected by a 25 m buffer zone during construction.

The Chance Finds procedures provided in the report must be included in the EMPr for all intervention measures as well as the cattle fence construction.

SAHRA could not process the case to its conclusion until the accompanying environmental documents (BAR and appendices) were submitted to the case. The BAR has since been submitted and within section 7.1.4, it states that an archaeological excavation must be undertaken for site at 23°25'13" S 30°54'52" E (under a permit issued by SAHRA). The grave site at 23°25'13" S30°54'52" E will not be directly impacted but it may be impacted indirectly by construction activities. A buffer of 25 m radius must be applied to the grave site as a no-go area.

Final Comment

The South African Heritage Resources Agency (SAHRA) Archaeology, Palaeontology and Meteorites (APM) Unit accepts the recommendations provided in the HIA report however, the buffer zone around the grave must be increased to 30m.

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Nokukhanya Khumalo
Tel: 021 462 4502
Email: nkhumalo@sahra.org.za
CaseID: 13451

The following additional recommendations must also be included as part of the EMPr for implementation during construction:

- An archaeologist must be appointed to undertake a weekly monitoring programme of all construction activities and develop a heritage training manual for the induction of the construction crew and ECO.
- All access points to the construction site, construction camps, laydown areas and stockpile areas must be assessed by an archaeologist prior to the construction phase. A report of the walk down assessment must be submitted to SAHRA.
- Once the design of the weir is finalised the potential extent of flooding must be determined and the potential impacts to the surrounding heritage sites must be assessed. This assessment must be included in the walk-down report.
- A CMP must be developed from the findings of this assessment, the CMP must also address any monitoring measures required for the long-term maintenance of the weirs.
- In the unlikely event that fossils are uncovered during construction then construction must cease within the immediate vicinity, a buffer of 30 m must be established, and a palaeontologist called in to inspect the finds. The palaeontologist must obtain a section 35(4) permit in terms of NHRA and Chapter IV NHRA Regulations, before any fossils are collected.
- If there are any new heritages resources are discovered during construction and operation phases of the proposed development, then a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings at the expense of the developer.
- If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required at the expense of the developer. Mitigation will only be carried out after the archaeologist or palaeontologist obtains a permit in terms of section 35 of the NHRA (Act 25 of 1999). You may contact SAHRA APM Unit for further details: (Nokukhanya Khumalo/Phillip Hine 021 202 8654).
- If any unmarked human burials are uncovered and the archaeologist called in to inspect the finds and/or the police find them to be heritage graves, then mitigation may be necessary and the SAHRA Burial Grounds and Graves (BGG) Unit must be contacted for processes to follow (Thingahangwi Tshivase/Mimi Seetelo 072 802 1251).
- The Final BAR and its appendices must be uploaded to the case on SAHRIS.
- Once a decision on the EA application is reached, the record of decision must be uploaded to the case on SAHRIS.

Should you have any further queries, please contact the designated official using the case number quoted

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

above in the case header.

Yours faithfully

Nokukhanya Khumalo
Heritage Officer
South African Heritage Resources Agency

Phillip Hine
Acting Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

ADMIN:
Direct URL to case: http://www.sahra.org.za/node/520847

Terms & Conditions:

1. This approval does not exonerate the applicant from obtaining local authority approval or any other necessary approval for proposed work.
2. If any heritage resources, including graves or human remains, are encountered they must be reported to SAHRA immediately.
3. SAHRA reserves the right to request additional information as required.

APPENDIX F1

SCREENING TOOL REPORTS

SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION OR FOR A PART TWO AMENDMENT OF AN ENVIRONMENTAL AUTHORISATION AS REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE ENVIRONMENTAL SENSITIVITY

EIA Reference number:

Project name: Soutini Baleni Wetland Rehabilitation

Project title: Wetland B82G-01

Date screening report generated: 09/10/2019 11:02:41

Applicant: Working for Wetlands

Compiler: Aurecon SA (Pty) Ltd

Compiler signature:

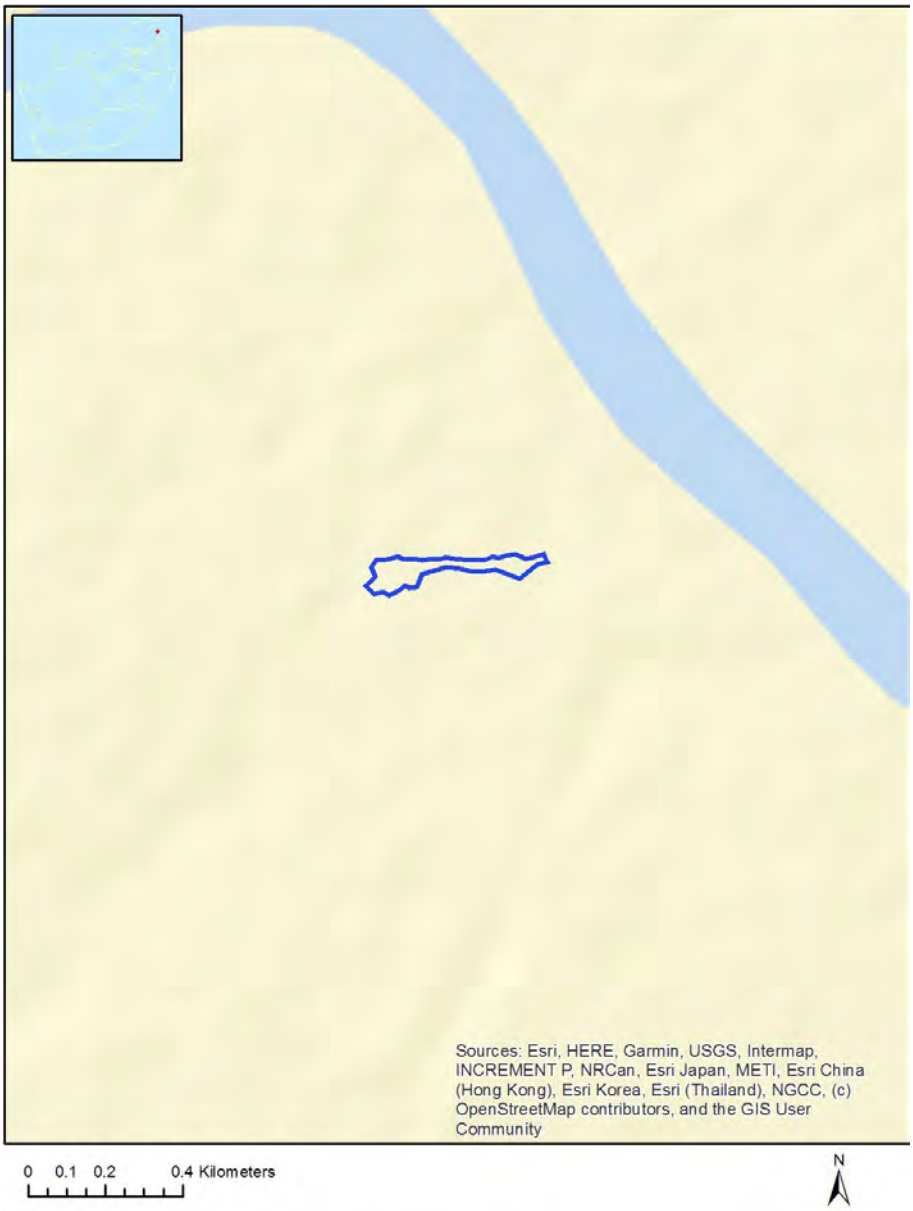
……

Table of Contents

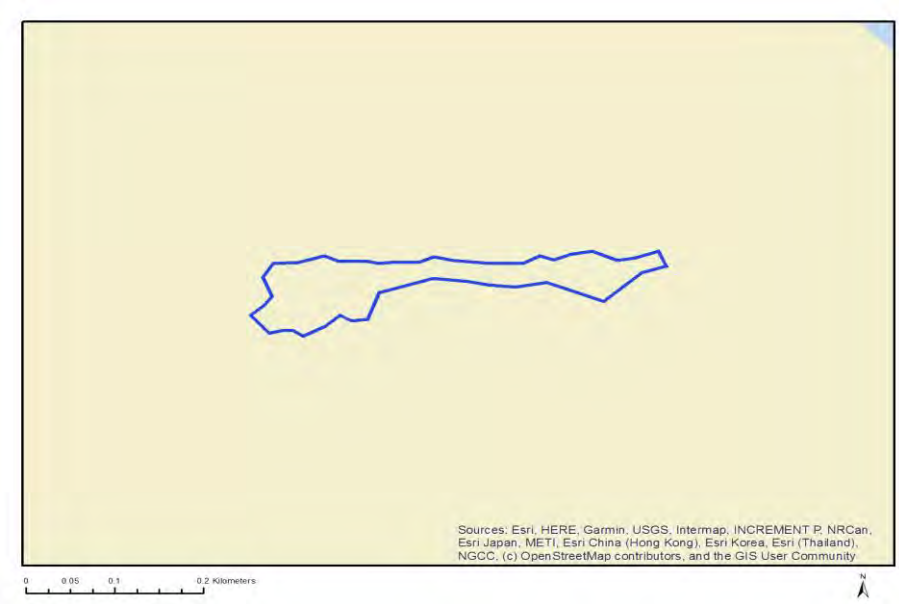
Proposed Project Location

Orientation map 1: General location

General Orientation: Soutini Baleni Wetland Rehabilitation



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	GREATER GIYANI	891	0	23°26'57.32S	30°50'7.01E	Farm
2	GREATER GIYANI	891	0	23°20'50.05S	30°48'48.87E	Farm Portion

Development footprint[1] vertices:
No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No nearby wind or solar developments found.

[1] "development footprint", means the area within the site on which the development will take place and incudes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

Environmental Management Frameworks relevant to the application

Environmental Management Framework	LINK
Olifants EMF	https://screening.environment.gov.za/ScreeningDownloads/EMF/Zone_46,_67,_78,_80,_92,_103,_122,_129.pdf

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development site as well as the most environmental sensitive features on the site based on the site sensitivity screening results for the application classification that was selected. The application classification selected for this report is:
Any activities within or close to a watercourse|Any activities within or close to a watercourse.

Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below.

No intersection with any development zones found.

Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones

Project Location: Soutini Baleni Wetland Rehabilitation

Proposed Development Area Environmental Sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme		X		
Aquatic Biodiversity Theme				X

Archaeological and Cultural Heritage Theme		X		
Civil Aviation Theme		X		
Plant Species Theme				X
Defence Theme				X
Terrestrial Biodiversity Theme	X			

Specialist assessments identified

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

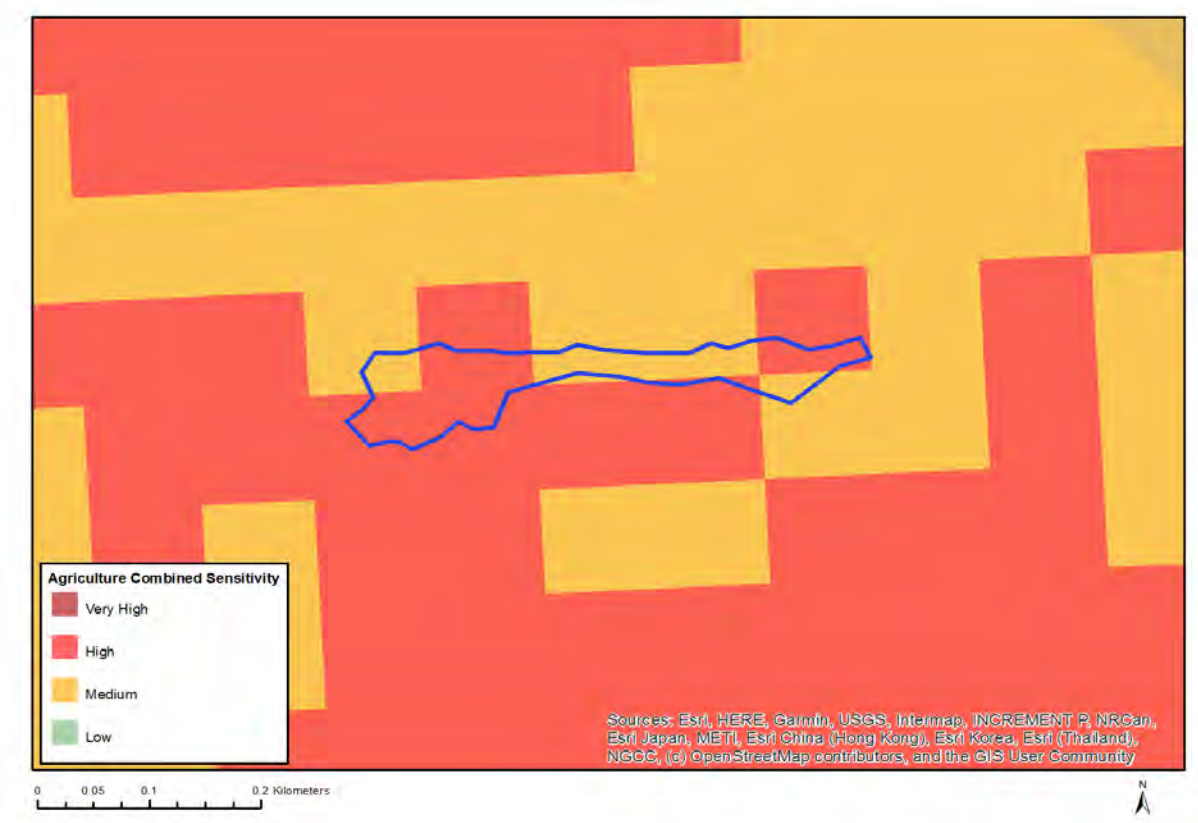
No	Specialist assessment	Assessment Protocol
1	Landscape/Visual Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
2	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
3	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
4	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf
5	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Aquatic_Biodiversity_Assessment.pdf
6	Hydrology Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
7	Socio-Economic Assessm	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf

	ent	
8	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
9	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf

Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

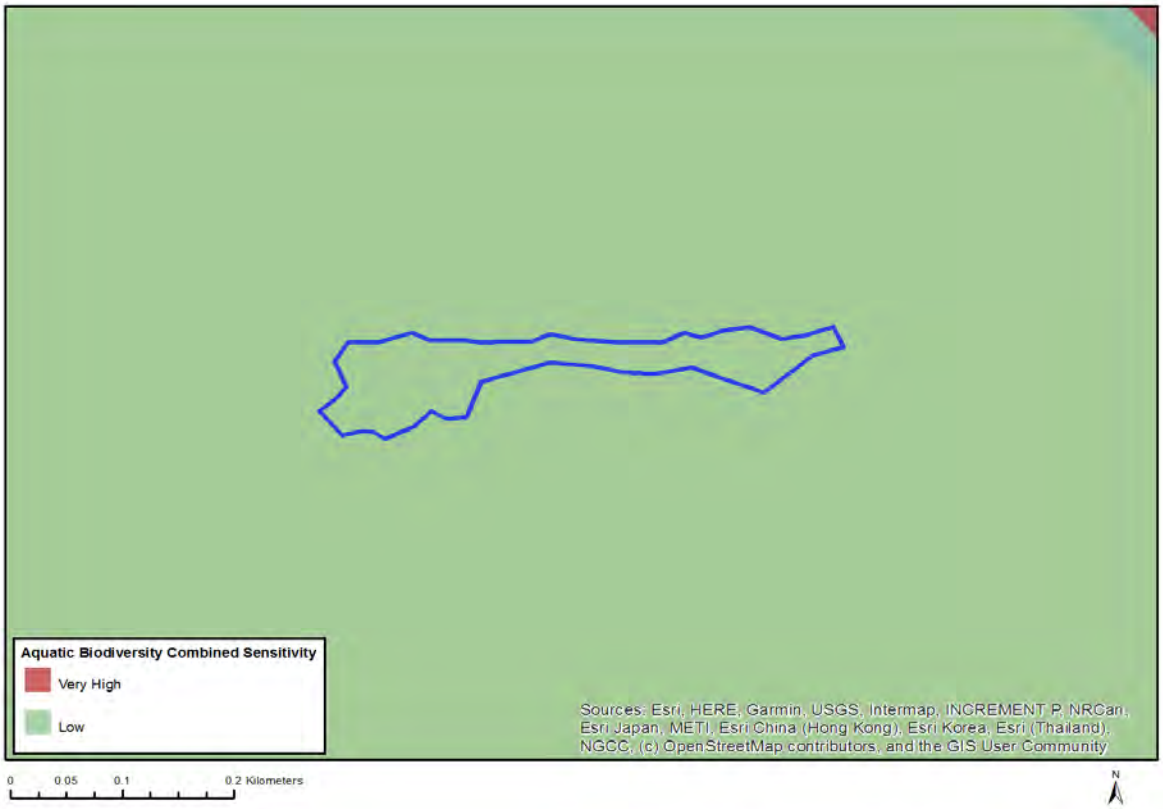


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Land capability;09. Moderate-High/10. Moderate-High
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

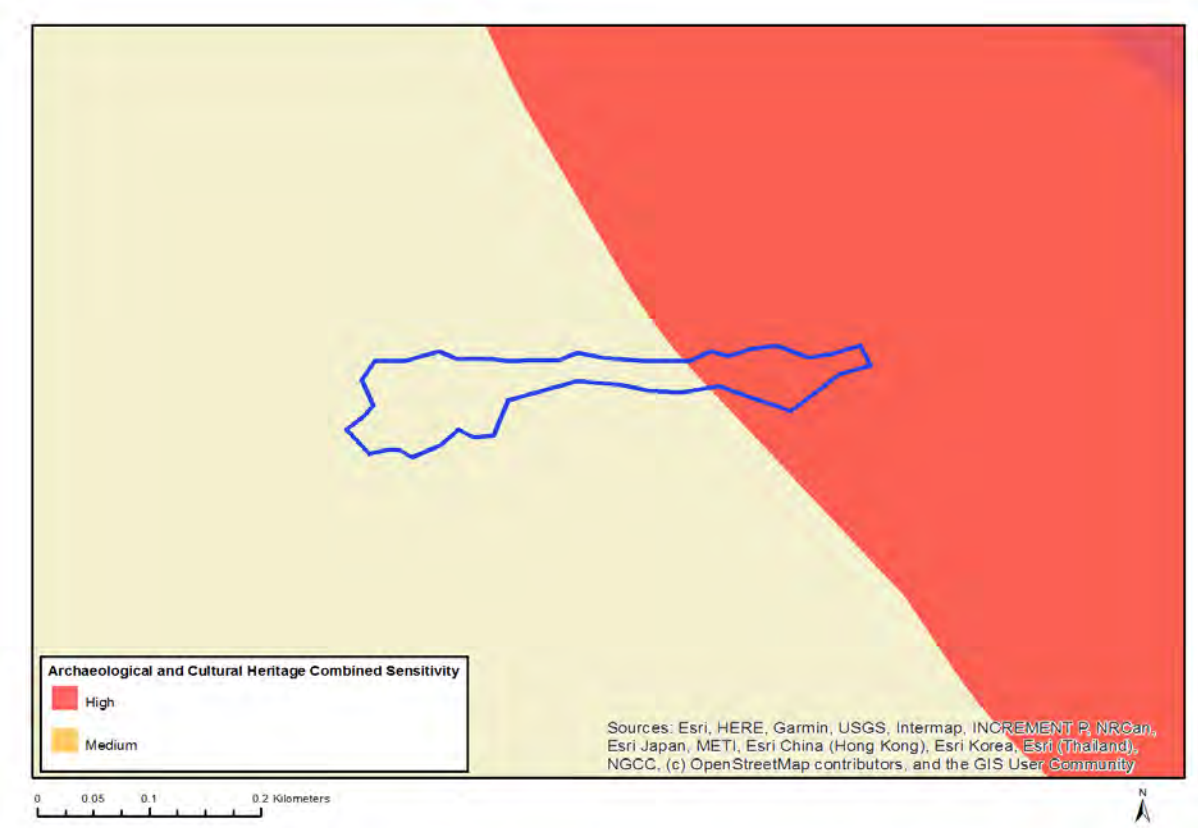


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity Areas

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Within 500 m of an important river

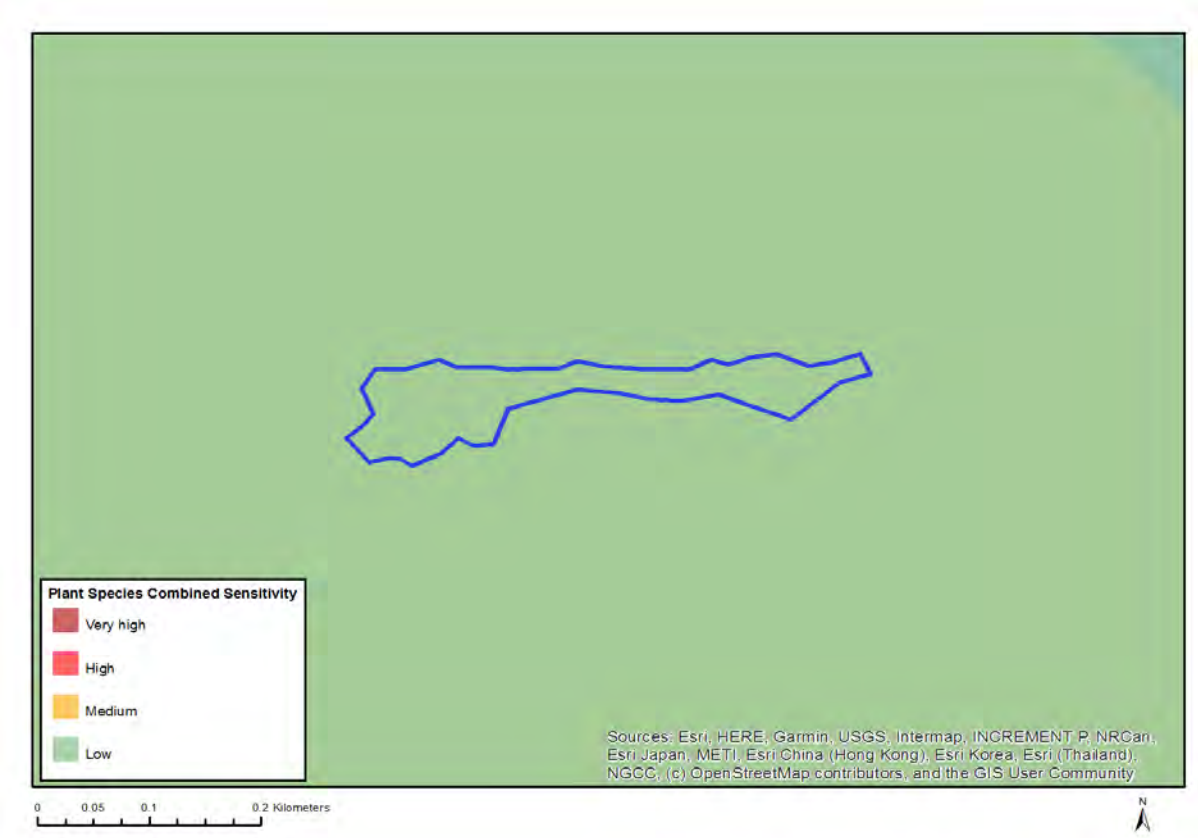
MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Dangerous and restricted airspace as demarcated

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

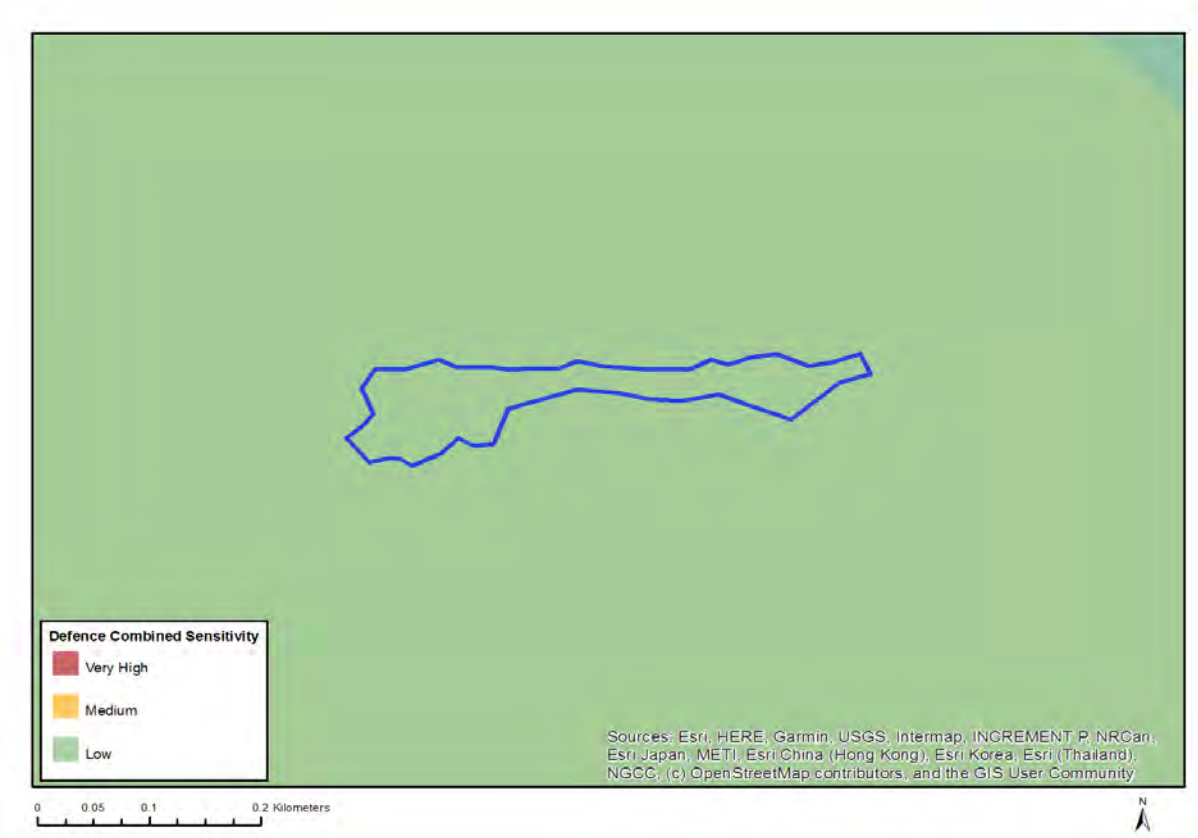


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE DEFENCE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	None
Very High	Critical Biodiversity Area 1

SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION OR FOR A PART TWO AMENDMENT OF AN ENVIRONMENTAL AUTHORISATION AS REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE ENVIRONMENTAL SENSITIVITY

EIA Reference number:

Project name: Soutini Baleni Wetland Rehabilitation

Project title: Wetland B82G-02

Date screening report generated: 09/10/2019 11:09:54

Applicant: Working for Wetlands

Compiler: Aurecon SA (Pty) Ltd

Compiler signature:

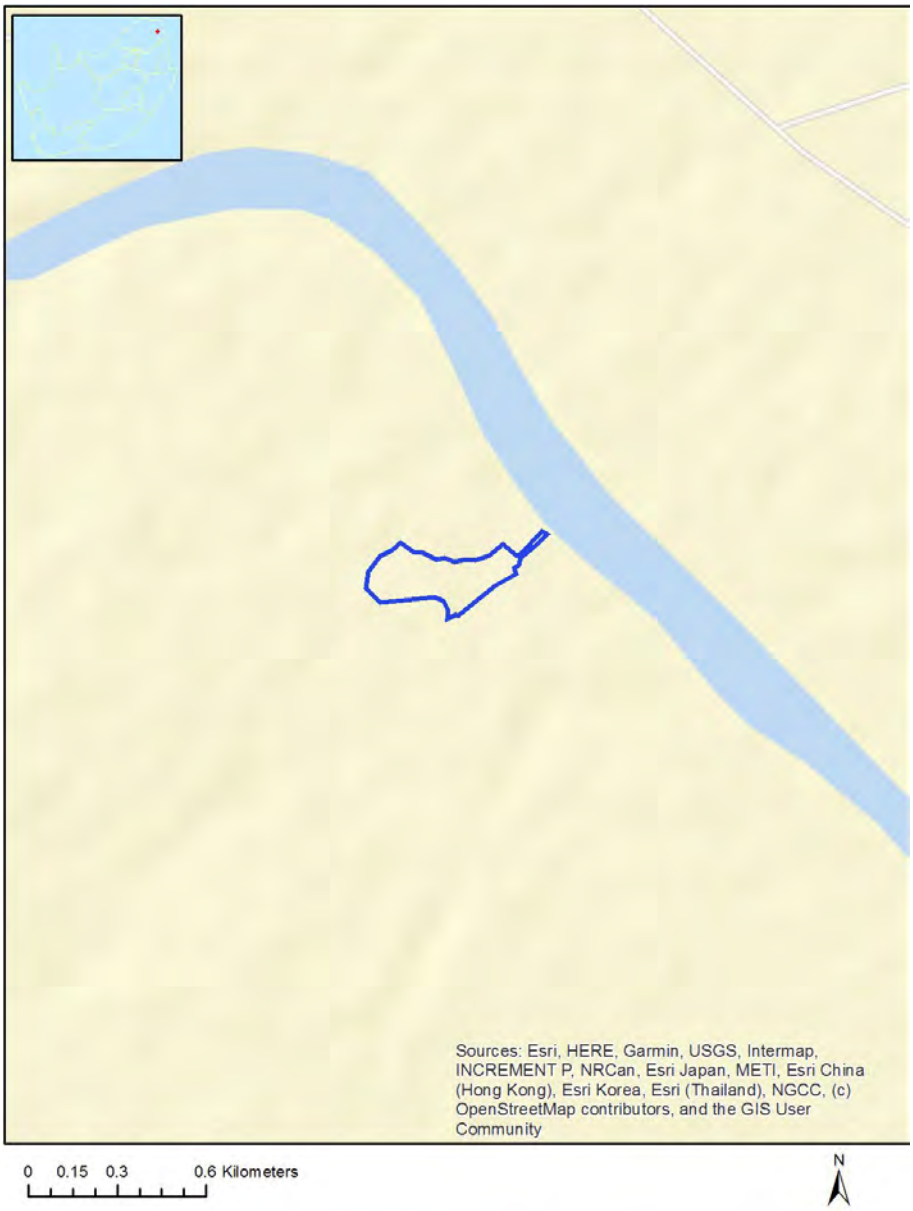
……

Table of Contents

Proposed Project Location

Orientation map 1: General location

General Orientation: Soutini Baleni Wetland Rehabilitation



Map of proposed site and relevant area(s)

Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	GREATER GIYANI	891	0	23°26'57.32S	30°50'7.01E	Farm
2	GREATER GIYANI	891	0	23°20'50.05S	30°48'48.87E	Farm Portion

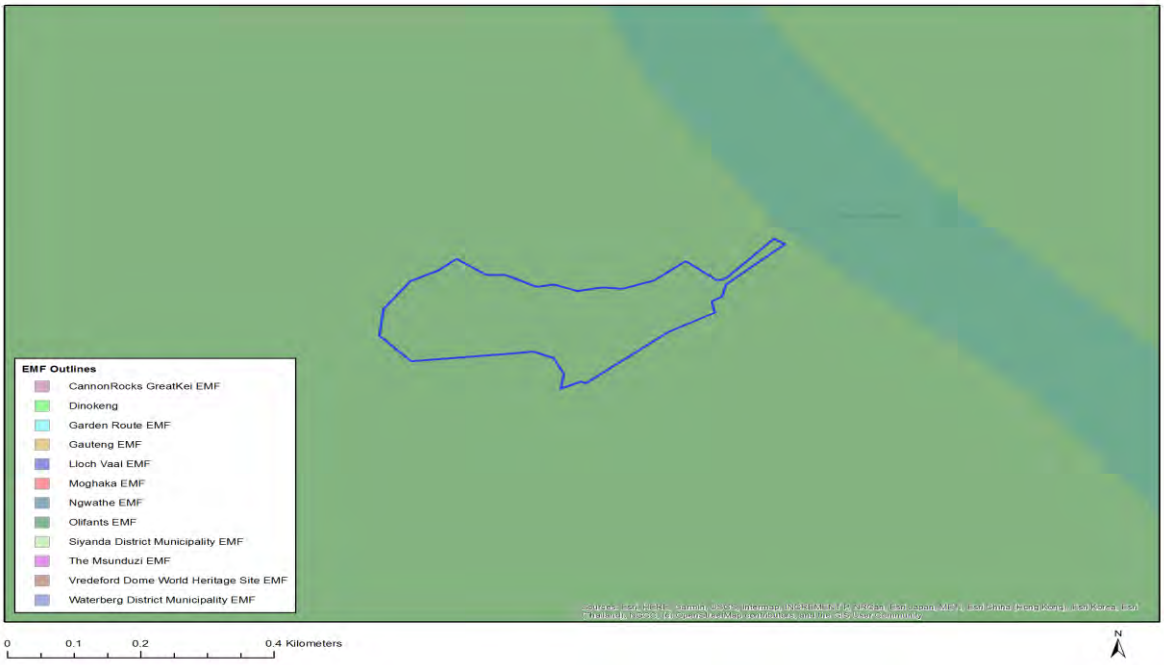
Development footprint[1] vertices:
No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No nearby wind or solar developments found.

[1] "development footprint", means the area within the site on which the development will take place and incudes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

Environmental Management Frameworks relevant to the application



Environmental Management Framework	LINK
Olifants EMF	https://screening.environment.gov.za/ScreeningDownloads/EMF/Zone_46,_67,_78,_80,_92,_103,_122,_129.pdf

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development site as well as the most environmental sensitive features on the site based on the site sensitivity screening results for the application classification that was selected. The application classification selected for this report is:
Any activities within or close to a watercourse|Any activities within or close to a watercourse.

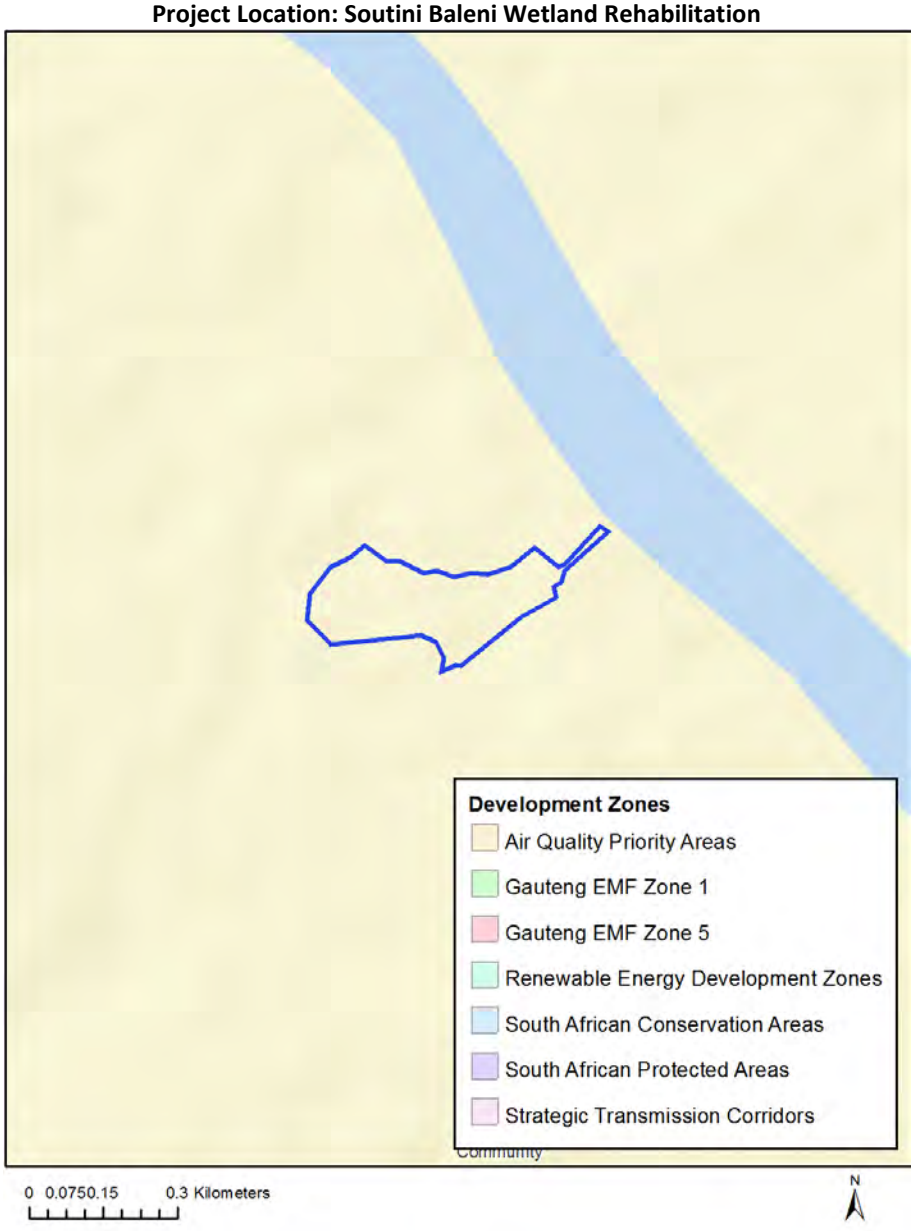
Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below.

No intersection with any development zones found.

Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones

Project Location: Soutini Baleni Wetland Rehabilitation



Proposed Development Area Environmental Sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme		X		
Aquatic Biodiversity Theme				X

Archaeological and Cultural Heritage Theme		X		
Civil Aviation Theme		X		
Plant Species Theme				X
Defence Theme				X
Terrestrial Biodiversity Theme	X			

Specialist assessments identified

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

No	Specialist assessment	Assessment Protocol
1	Landscape/Visual Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
2	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
3	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
4	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf
5	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Aquatic_Biodiversity_Assessment.pdf
6	Hydrology Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
7	Socio-Economic Assessm	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf

	ent	
8	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
9	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf

Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

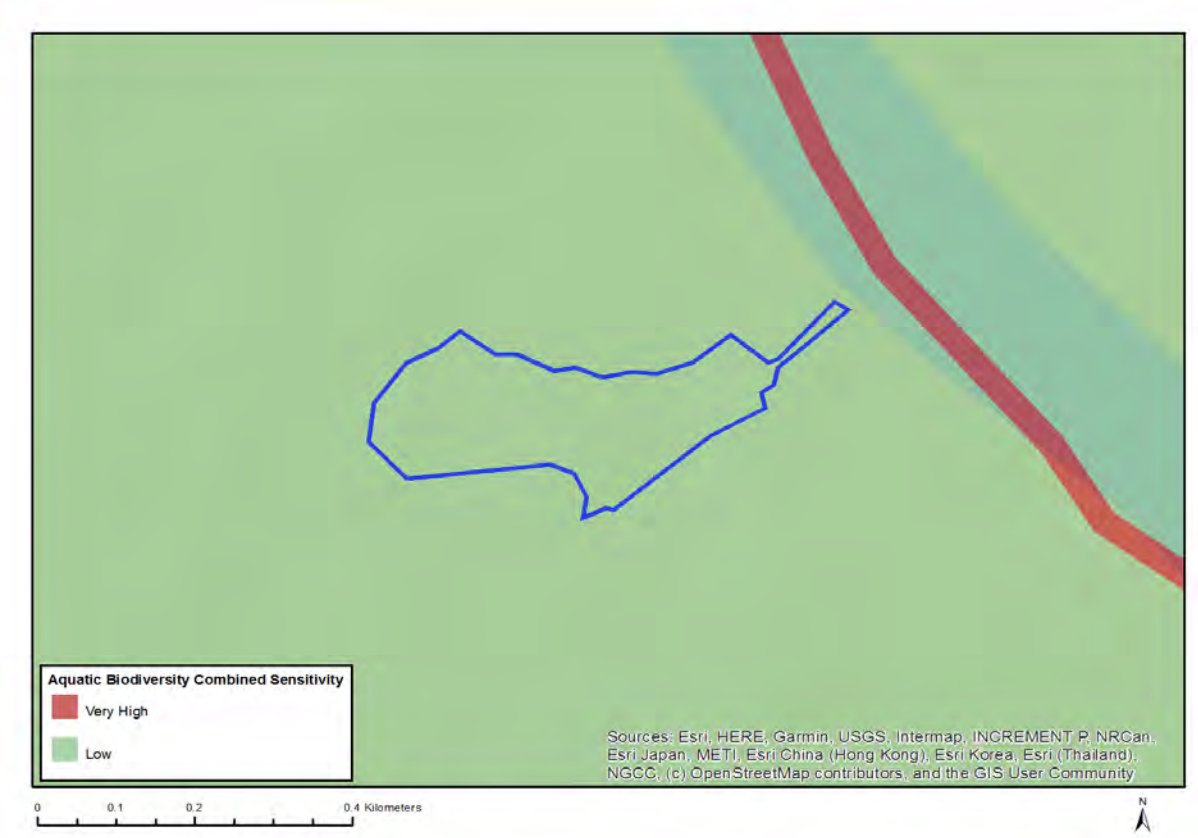
MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Land capability;09. Moderate-High/10. Moderate-High
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

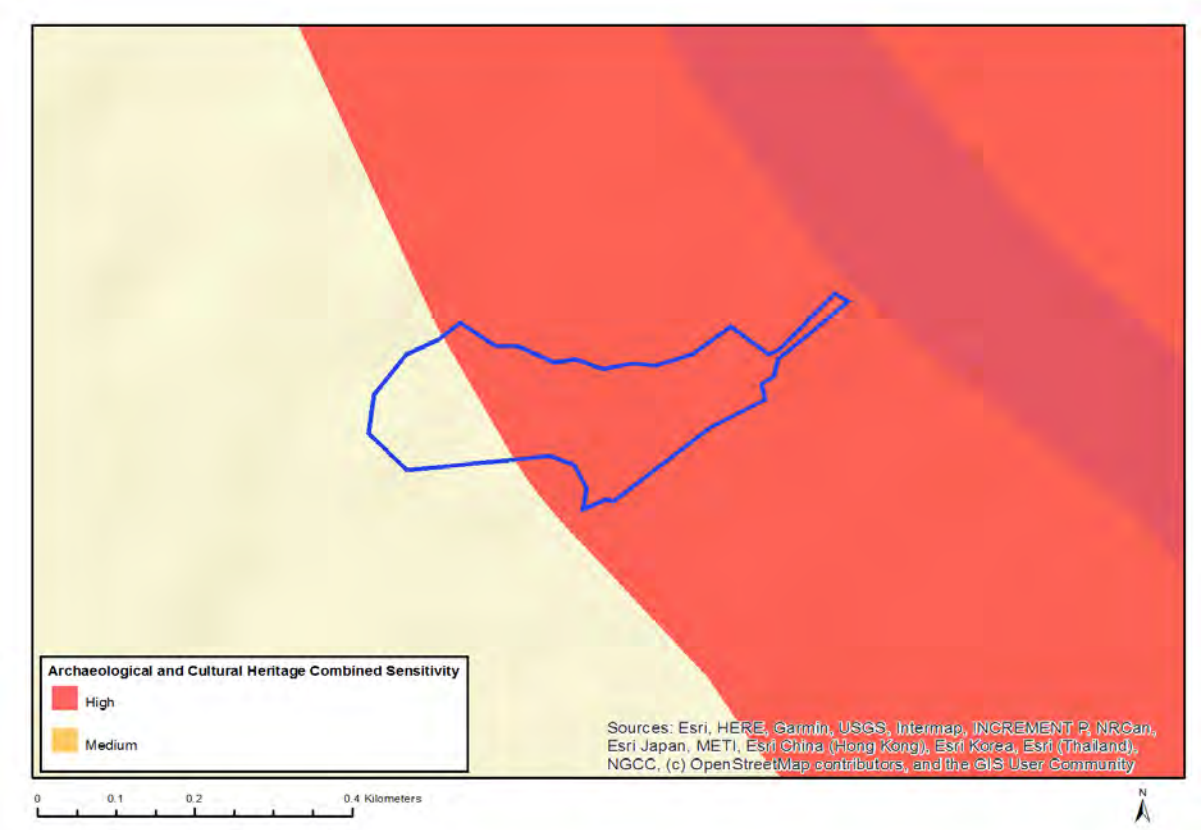


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity Areas

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Within 500 m of an important river
High	Within 500 m of an important wetland

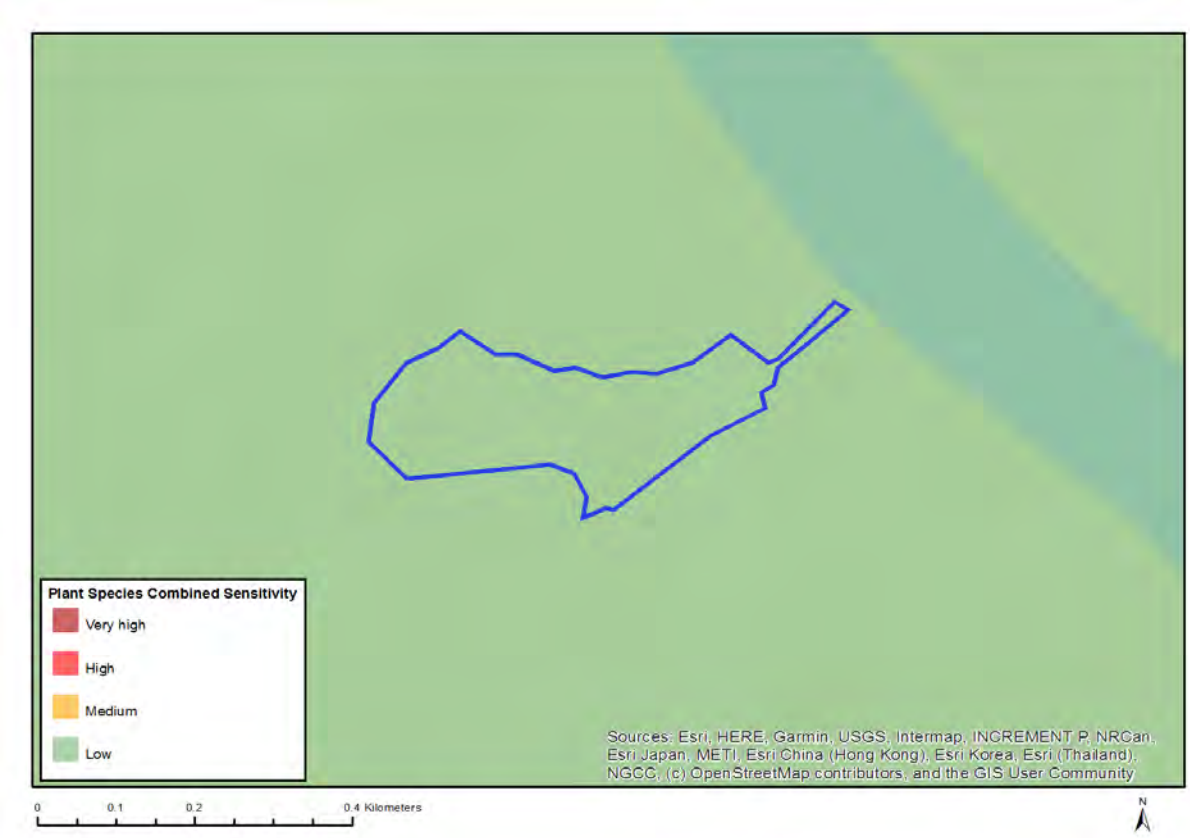
MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Dangerous and restricted airspace as demarcated

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

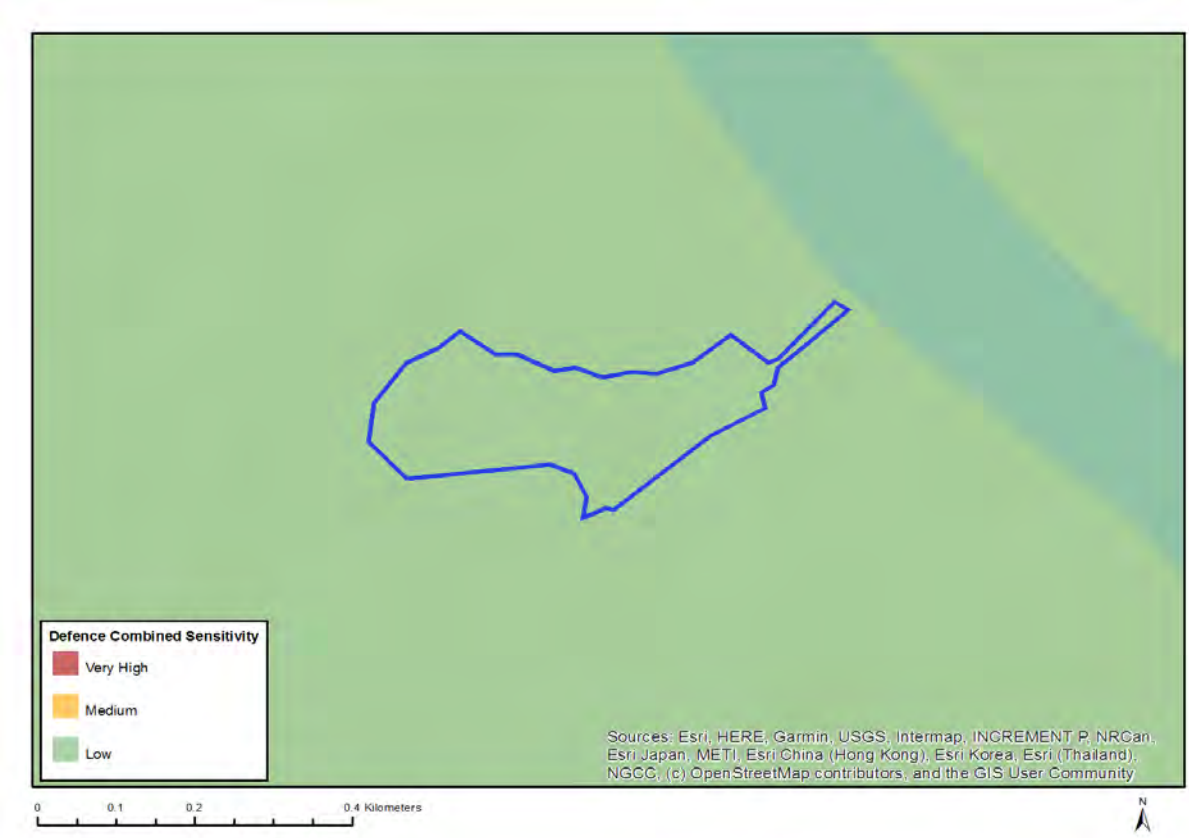


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE DEFENCE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	None
Very High	Critical Biodiversity Area 1

SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION OR FOR A PART TWO AMENDMENT OF AN ENVIRONMENTAL AUTHORISATION AS REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE ENVIRONMENTAL SENSITIVITY

EIA Reference number:

Project name: Soutini Baleni Wetland Rehabilitation

Project title: Wetland B82G-03

Date screening report generated: 09/10/2019 12:18:00

Applicant: Working for Wetlands

Compiler: Aurecon SA (Pty) Ltd

Compiler signature:

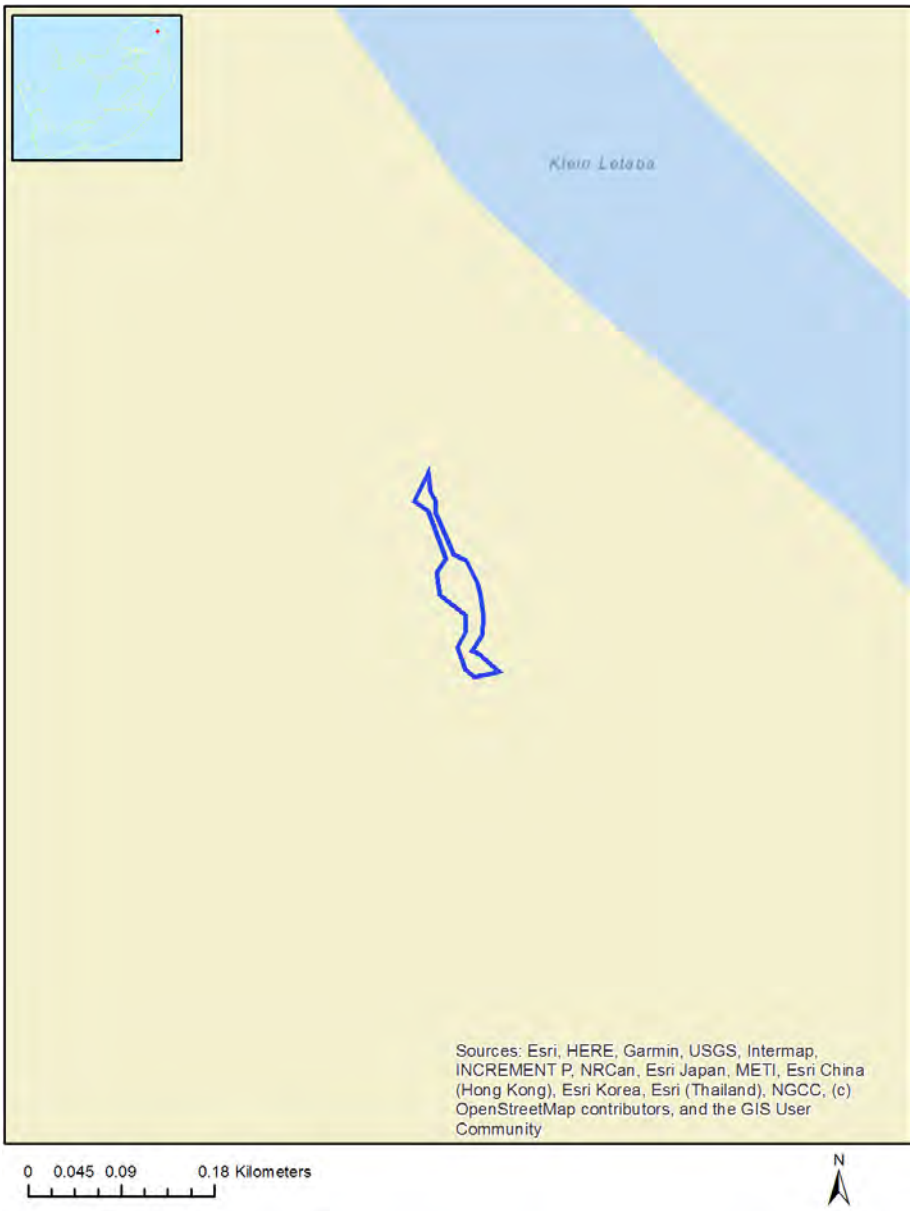
……

Table of Contents

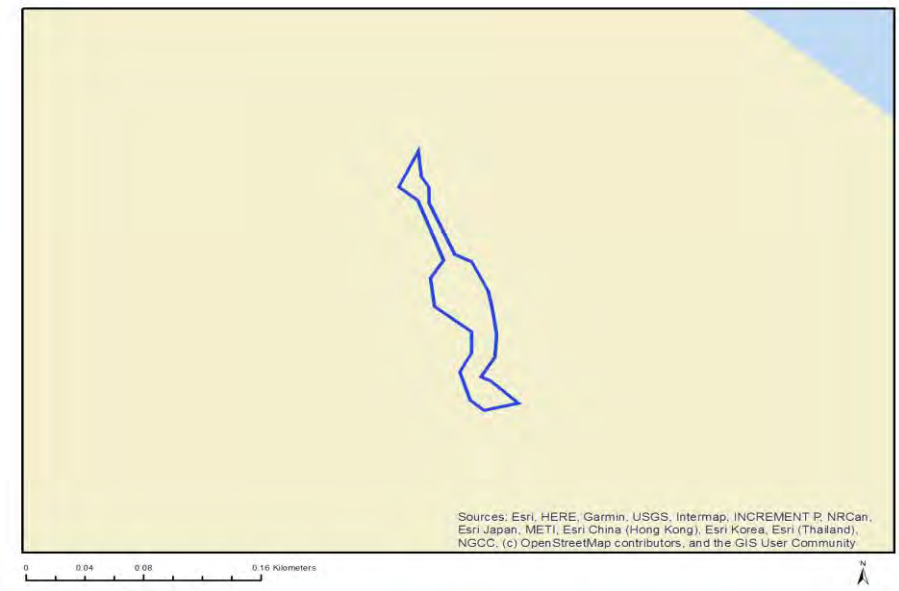
Proposed Project Location

Orientation map 1: General location

General Orientation: Soutini Baleni Wetland Rehabilitation



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	GREATER GIYANI	891	0	23°26'57.32S	30°50'7.01E	Farm
2	GREATER GIYANI	891	0	23°20'50.05S	30°48'48.87E	Farm Portion

Development footprint[1] vertices:
No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No nearby wind or solar developments found.

[1] "development footprint", means the area within the site on which the development will take place and incudes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

Environmental Management Frameworks relevant to the application

Environmental Management Framework	LINK
Olifants EMF	https://screening.environment.gov.za/ScreeningDownloads/EMF/Zone_46,_67,_78,_80,_92,_103,_122,_129.pdf

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development site as well as the most environmental sensitive features on the site based on the site sensitivity screening results for the application classification that was selected. The application classification selected for this report is:
Any activities within or close to a watercourse|Any activities within or close to a watercourse.

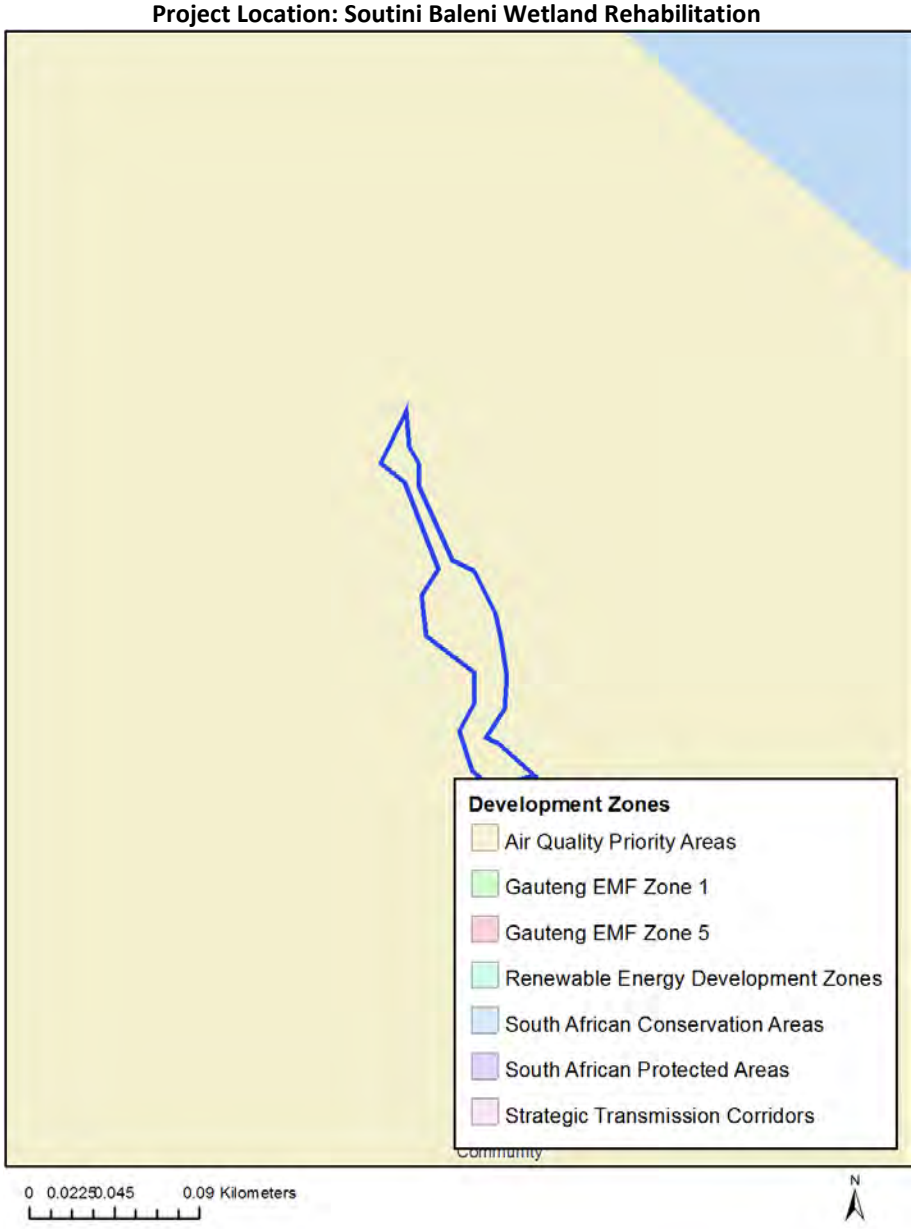
Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below.

No intersection with any development zones found.

Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones

Project Location: Soutini Baleni Wetland Rehabilitation



Proposed Development Area Environmental Sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme		X		
Aquatic Biodiversity Theme				X

Archaeological and Cultural Heritage Theme		X		
Civil Aviation Theme		X		
Plant Species Theme				X
Defence Theme				X
Terrestrial Biodiversity Theme	X			

Specialist assessments identified

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

No	Specialist assessment	Assessment Protocol
1	Landscape/Visual Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
2	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
3	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
4	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf
5	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Aquatic_Biodiversity_Assessment.pdf
6	Hydrology Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
7	Socio-Economic Assessm	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf

	ent	
8	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
9	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf

Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

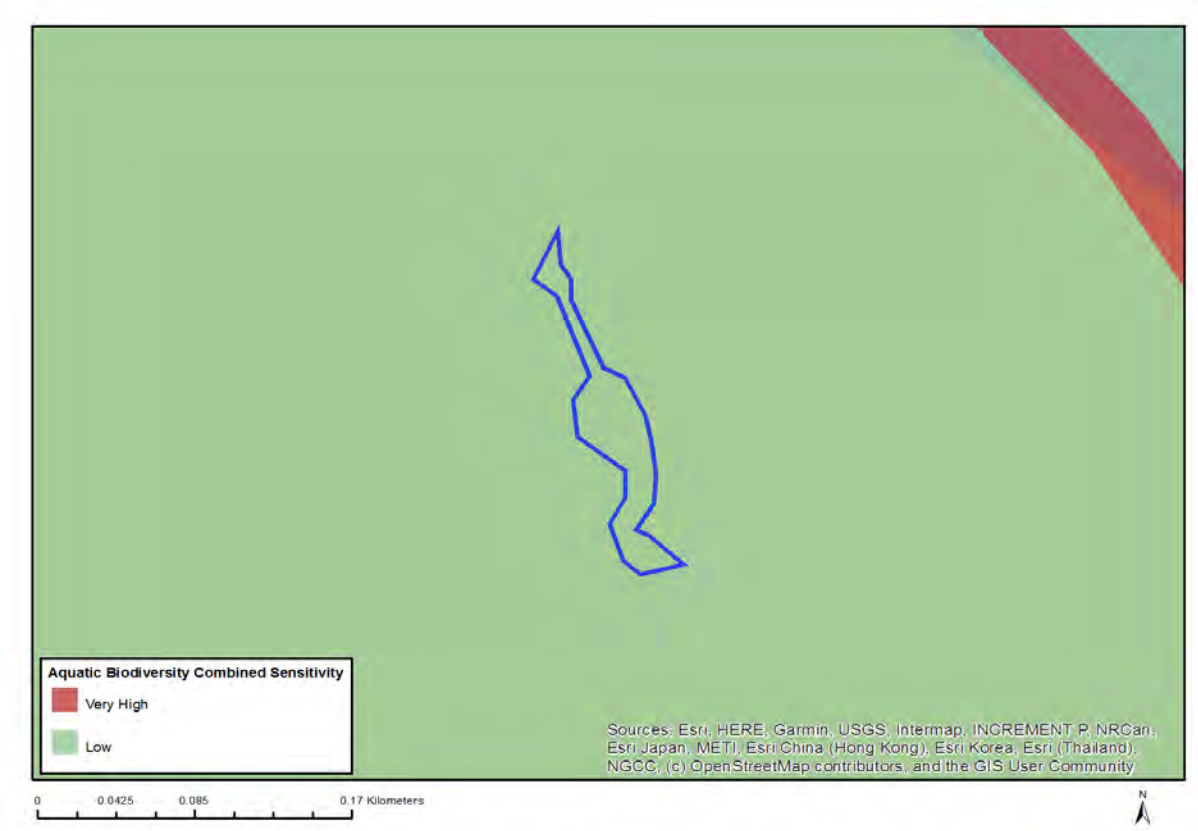
MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Land capability;09. Moderate-High/10. Moderate-High
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity Areas

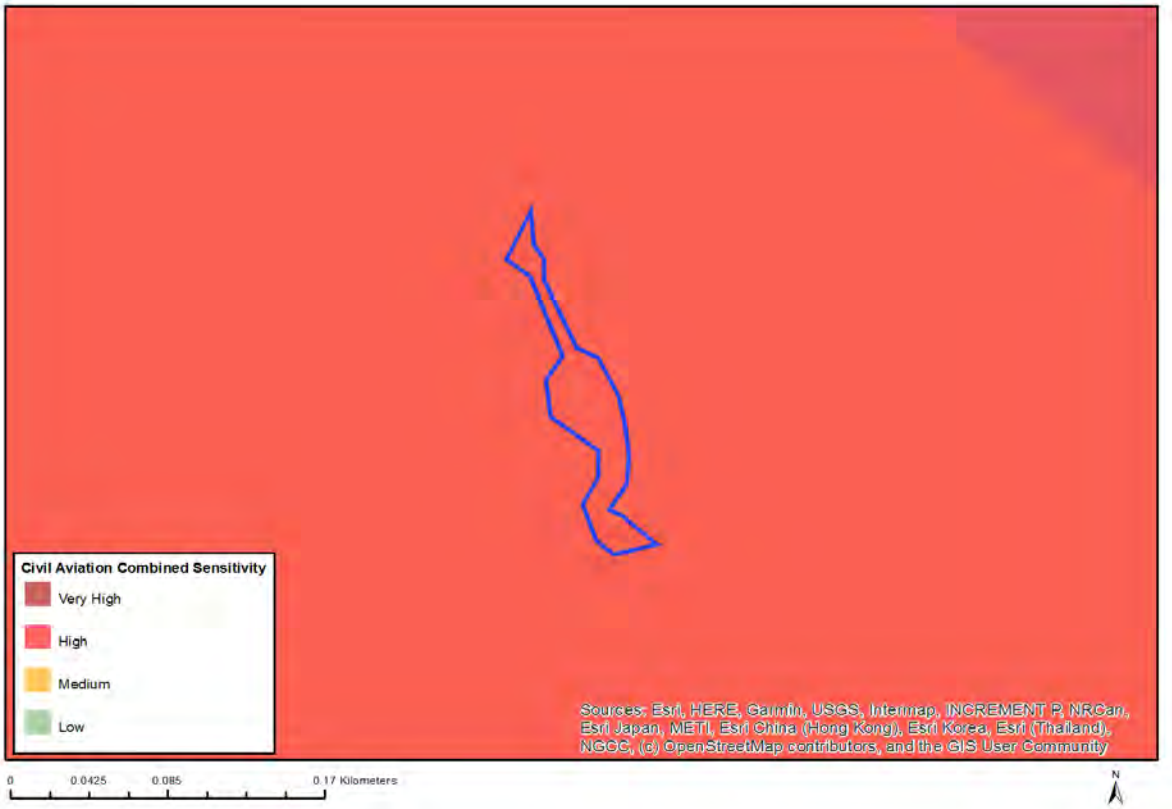
MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Within 500 m of an important river
High	Within 500 m of an important wetland

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY

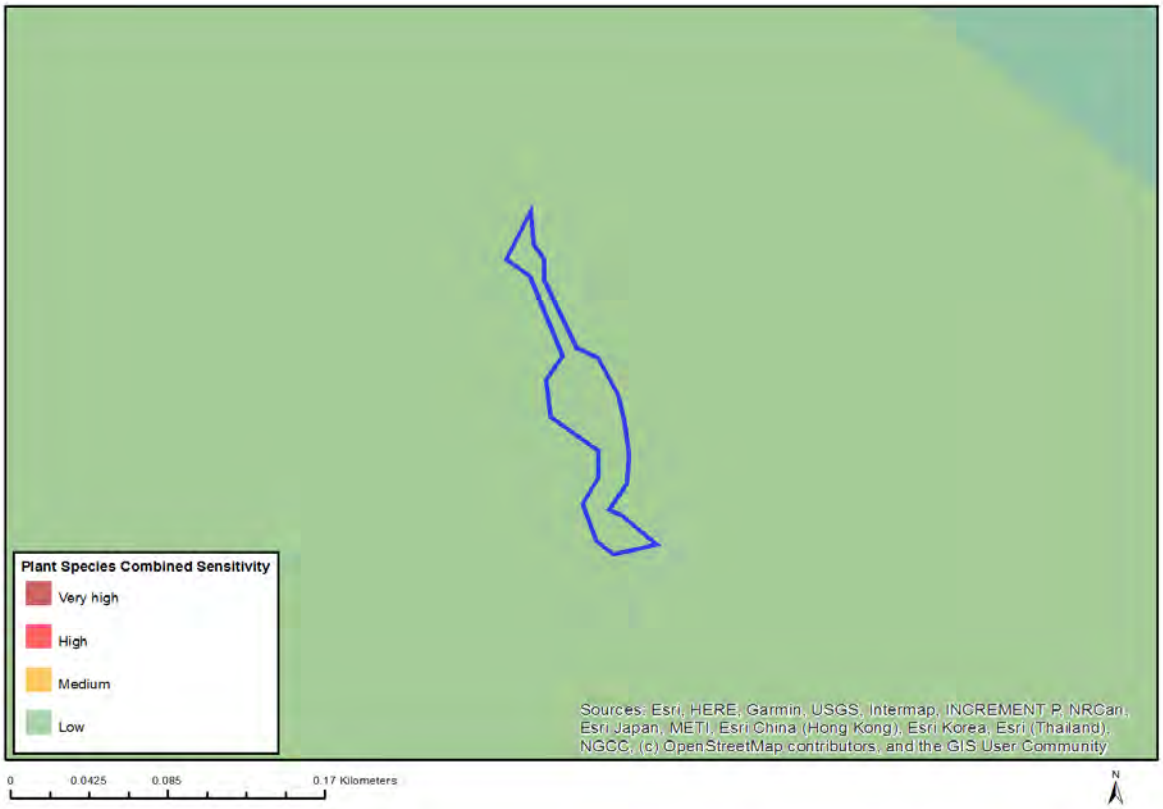


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Dangerous and restricted airspace as demarcated

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

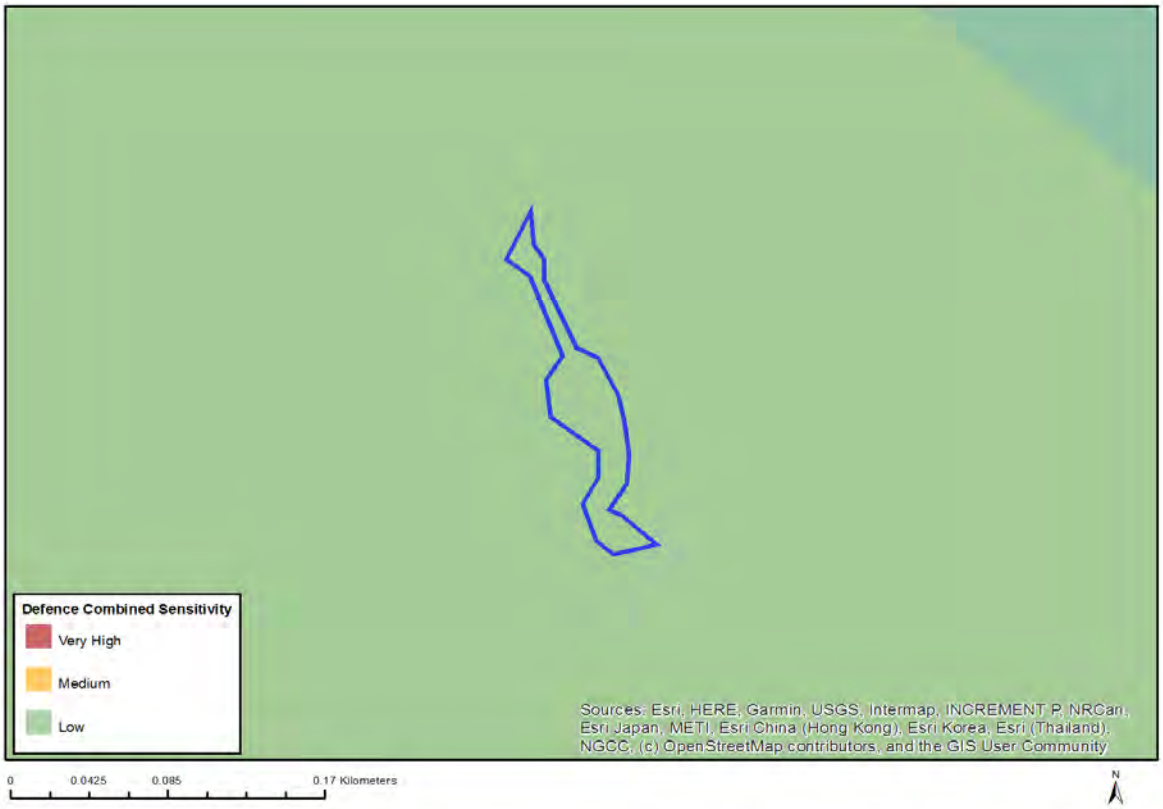


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE DEFENCE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	None
Very High	Critical Biodiversity Area 1