DECOMMISSIONING OF THE KRIEL POWER STATION ASBESTOS LANDFILL SITE

Mpumalanga Province

FINAL BASIC ASSESSMENT REPORT

August 2019

savannah environmental

t +27 (0)11 656 3237
f +27 (0)86 684 0547
e info@savannahsa.com
w www.savannahsa.com

Prepared for:

ESKOM Holdings SOC Limited (Pty) Ltd
Kriel Power Station
Ogies/Bethal Road
Kriel
2271

Prepared by:

savannah environmental

t +27 (0)11 656 3237 f +27 (0)86 684 0547 e info@savannahsa.com w www.savannahsa.com
First Floor, Block 2, 5 Woodlands Drive Office Park, Cnr Woodlands Drive & Western Service Road, Woodmead, 2191

PROJECT DETAILS

Title	:	Final Basic Assessment Report for the Decommissioning of the Kriel Power Station Asbestos Landfill Site, Mpumalanga Province
Authors	:	Savannah Environmental (Pty) Ltd Reuben Maroga Gideon Raath Nicolene Venter Jo-Anne Thomas
Client	:	Eskom Holdings SOC Limited
Report Revision	:	Revision 0
Date	:	August 2019

When used as a reference this report should be cited as: Savannah Environmental (2019) Final Basic Assessment Report for the Decommissioning of the Kriel Power Station Asbestos Landfill Site, Mpumalanga Province.

PURPOSE OF THE BASIC ASSESSMENT REPORT

Eskom Holdings SOC Ltd is proposing the decommissioning of an asbestos landfill site at the Kriel Power Station (KPS) located ~8km west of Kriel, 27km south of Ogies and 34km north-west of Bethal, in the Mpumalanga Province. The project site falls within the jurisdiction of the Nkangala District Municipality (NDM) and the eMalahleni Local Municipality (ELM). The asbestos landfill site is located within Ash Dam 1, approximately 1.76km south of the generation units of the KPS, ~4.63km east of the units at the Matla Power Station and 2.4km north of Ash Dam 2 within the KPS development footprint. This landfill site is currently not in use and has been fully covered by ash.

Eskom Holdings SOC Ltd has appointed Savannah Environmental as independent environmental consultants to undertake a Basic Assessment Process for the decommissioning of the asbestos landfill site at the Kriel Power Station in support of an application for a Waste Management License (WML). The BA process is being undertaken in accordance with the requirements of the EIA Regulations of December 2014 (GN R326), as amended on 07 April 2017, promulgated in terms of the National Environmental Management Act (Act No. 107 of 1998).

This Basic Assessment Report aims to:

- Identify and evaluate potential environmental (biophysical) impacts and benefits of decommissioning the asbestos landfill site at the Kriel Power Station through a desktop review of existing baseline data.
- Define the scope of the BA process.
- Identify potentially sensitive environmental features and areas on the site.
- Provide the authorities with sufficient information in order to make a decision regarding the proposed project.

Within this context, the objectives of this Basic Assessment process are to, through a consultative process:

- Identify the relevant policies and legislation relevant to the project;
- Motivate the need and desirability of the proposed project, including the need and desirability of the activity in the context of the location;
- Assess the key issues identified in the Basic Assessment Process; and
- Recommend suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

LEGAL REQUIREMENTS IN TERMS OF THE EIA REGULATIONS

An overview of the contents of the Final Basic Assessment Report, as prescribed by Appendix 1 of the 2014 EIA Regulations (GNR 326) as amended; and where the corresponding information can be found within the report is provided in **Table 1.**

Table 1: Legal requirements in terms of the EIA regulations

EIA REGULATIONS 2014 (as amended) GNR 326: Appendix 1 CONTENT OF THE BASIC ASSESSMENT REPORTS			Cross-reference in this Basic Assessment Report
A Basic Assessment Report must contain all the information that is necessary for the competent authority to consider and come to a decision on the application, and must include-			
(a)	Details of –		
	(i)	The EAP who prepared the report.	Chapter 1 Section 1.5
	(ii)	The expertise of the EAP, including a curriculum vitae.	
(b)	The location of the activity, including –		
	(i)	The 21 digit Surveyor General code of each cadastral land parcel.	Chapter 2 Section 2.2.1 and 2.2.2
	(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.	
(c)	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is –		
	(i)	A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken.	Chapter 2 Section 2.2.1 Figure 1.1
	(ii)	On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	
(d)	A description of the scope of the proposed activity, including –		
	(i)	All listed and specified activities triggered.	Chapter 3 Section 3.1.2 Table 3.1
	(ii)	A description of the activities to be undertaken, including associated structures and infrastructure.	
(e)	A description of the policy and legislative context within which the development is proposed including- (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.		Chapter 3 Section 3.1 – 3.2
(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.		Chapter 2 Section 2.3 – 2.8
(g)	A motivation for the preferred site, activity and technology alternative.		
(h)	A full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including –		
	(i)	Details of all the alternatives considered.	Chapter 2 Section 2.7
	(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 3 Section 3.3
	(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.	Chapter 3 Section 3.3.3

EIA REGULATIONS 2014 (as amended) GNR 326: Appendix 1 CONTENT OF THE BASIC ASSESSMENT REPORTS			Cross-reference in this Basic Assessment Report
	(iv)	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	Chapter 4 Section 4.2 – 4.10
	(v)	The impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts – (aa) Can be reversed. (bb) May cause irreplaceable loss of resources. (cc) Can be avoided, managed or mitigated.	Chapter 5 Section 5.3 – 5.5
	(vi)	The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives.	Chapter 3 Section 3.4
	(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 5 Section 5.4.1 – 5.4.3
	(viii)	The possible mitigation measures that could be applied and level of residual risk.	
	(ix)	The outcome of the site selection matrix.	Chapter 3 Section 2.4 – 2.8
	(x)	If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such.	
	(xi)	A concluding statement indicating the preferred alternatives, including preferred location of the activity.	
(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- (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.		Chapter 3 Section 3.4
(j)	An assessment of each identified potentially significant impact and risk, including- (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.		Chapter 5 Section 5.3 – 5.5
(k)	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 of to these Regulations and an indication as to how these findings and recommendations have been included in this Report;		Not Applicable
(l)	An environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment;		Chapter 6 Section 6.6

	EIA REGULATIONS 2014 (as amended) GNR 326: Appendix 1 CONTENT OF THE BASIC ASSESSMENT REPORTS	Cross-reference in this Basic Assessment Report
	(ii) a map at an appropriate scale of which superimposes the proposed activity and its associated structures and infrastructures on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative and risks of the proposed activity and identified alternatives.	Figure 6.1
(m)	Based on the assessment and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr	Not Applicable
(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.	Chapter 6 Section 6.7
(o)	A description of any assumptions, uncertainties, and gaps of knowledge which relate to the assessment and mitigation measures proposed.	Chapter 3 Section 3.4
(p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if it the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	Chapter 6 Section 6.7
(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.	Not Applicable
(r)	An undertaking under oath or affirmation by the EAP in relation to- (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	Included in the application form
(s)	Where applicable, details of the financial provision for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts.	Not Applicable
(t)	Any specific information that may be required by the Competent Authority.	All sufficient information which the Department may require to issue a decision on the application has been provided in the application form and the BA Report.
(u)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	
2.	Where a government notice gazetted by the Minister Provides for any protocol or minimum information requirement to be applied to a scoping report, the requirements as indicated in such notice will apply.	Not Applicable

INVITATION TO COMMENT ON THE DRAFT BASIC ASSESSMENT REPORT

This BA Report was made available for a 30-day public review period from, **Friday 19 July 2019 to Monday, 19 August 2019** at the following locations:

- Kriel Public Library, Cnr Quintin and Heinrich Street, Kriel; and
- https://www.savannahsa.com/public-documents/other/

Therefore, this Final BA Report includes all comments received, as well as, responses to those comments from (refer to **Appendix C8).** Where applicable, this Final BA Report (and the appendices) has been amended to address those comments. All the amendments and/or additions to this Report have been underlined for ease of reference.

EXECUTIVE SUMMARY

Background

Eskom Holdings SOC Ltd is proposing the decommissioning of an asbestos landfill site at the Kriel Power Station (KPS) located ~8km west of Kriel, 27km south of Ogies and 34km north-west of Bethal, in the Mpumalanga Province. The project site falls within the jurisdiction of the Nkangala District Municipality (NDM) and the eMalahleni Local Municipality (ELM). The asbestos landfill site is located approximately 1.76km south of the generation units of the KPS, ~4.63km east of the units at the Matla Power Station and 2.4km north of Ash Dam 2 within the KPS development footprint. This landfill site is currently not in use and has been fully covered by ash.

The asbestos landfill site is located along the northern boundary of Ash Dam 1 (**Figure 1.1**) and occupies an area of approximately 2.3ha and is 30m wide and 30m long with an approximate capacity of 1500m^3, which was sufficient to accommodate asbestos waste at the power station for 30 years. The waste was generated from the stripping of asbestos containing materials at the station (i.e. ceiling boards, office structures, insulation materials etc.), as part of Eskom's Asbestos Phase Out Programme.

The site was developed in the form of a void (using back actors) to accommodate multiple cells within which double-lined and impermeable heavy-duty plastic bags containing asbestos waste were disposed of. These cells were 10m long and 5m wide and were located 1.5m deep from the surface of the surrounding ash layer at the time. Each cell had a capacity of 70m^3 and from 1992 (the year in which the asbestos disposal permit was obtained from the then DWAF) to 2008 (when disposal ceased on the site), approximately 50m^3 of asbestos waste was disposed of within the cells at the site.

Due to operations no longer taking place within the site at Ash Dam 1, Eskom Holdings SOC Limited is lodging an application for a Waste Management Licence from the National Department of Environmental Affairs (DEA) for the decommissioning of the asbestos landfill site within Ash Dam 1 at the Kriel Power Station.

The site in its current state is completely encapsulated and cemented by a thick succession of ash layers at the ash dam and no construction-related activities will be associated with the decommissioning of the landfill site. Taking this into consideration, the potential impacts associated with the decommissioning of the landfill site are expected to be of a low significance following the implementation of the mitigation measures recommended within the Basic Assessment process.

The conclusion on the findings of the EAP are that the potential impacts identified are to be at a localized level with a low probability. The following provides a summary of the findings of the BAR:

- *Impacts on* Groundwater Quality:
  Tt was concluded that potential impacts on groundwater resources within the vicinity of the landfill site and the station are of a low probability and significance and will not negatively affect the environment following the implementation of the mitigation measures recommended.

- *Impacts on Surface Water and Soil Contamination:*
  It was concluded that potential impacts on surface water and soil resources within the vicinity of the landfill site and the station are of a low probability and significance and will not negatively affect the environment following the implementation of the mitigation measures recommended.

» *Cumulative Impacts:*
The area surrounding Kriel Power Station has been significantly transformed and fragmented due to anthropogenic disturbances. In addition, no other similar asbestos landfill site are present or known to be operating within a 30km radius from the footprint of the power station. Therefore, no significant cumulative impacts are anticipated.

No environmental fatal flaws or impacts of very high, high or moderate significance were identified to be associated with the decommissioning of the asbestos landfill site at the Kriel Power Station. It is therefore the opinion of the EAP that the project be granted a waste management licence.

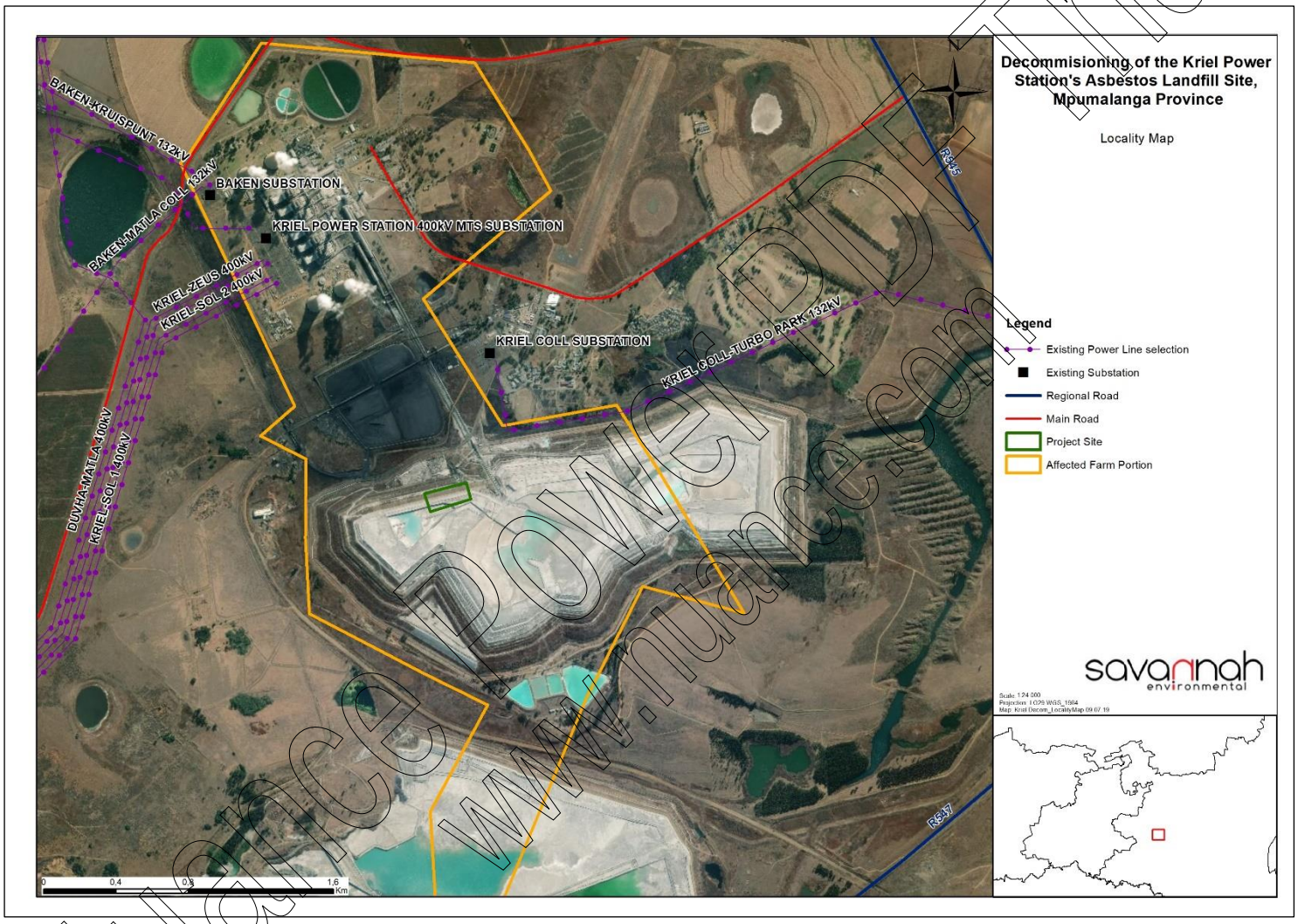

Figure 1.1: A locality map showing the location of the Asbestos Landfill Site at the Kriel Power Station.

TABLE OF CONTENTS

PAGE

PROJECT DETAILS ..... **i**
PURPOSE OF THE BASIC ASSESSMENT REPORT ..... **ii**
LEGAL REQUIREMENTS IN TERMS OF THE EIA REGULATIONS ..... **iii**
INVITATION TO COMMENT ON THE DRAFT BASIC ASSESSMENT REPORT ..... **vi**
EXECUTIVE SUMMARY ..... **vii**
TABLE OF CONTENTS ..... **x**
APPENDICES ..... **xii**
DEFINITIONS AND TERMINOLOGY ..... **xiii**
ABBREVIATIONS AND ACRONYMS ..... **xv**
CHAPTER 1: INTRODUCTION **16**
1.1 Overview of the Decommissioning of the Kriel Power Station's Asbestos Landfill Site **17**
1.2 Requirements for a Basic Assessment Process **19**
1.3 Overview of the Basic Assessment (BA) Process **19**
1.4 Objectives of the Basic Assessment Process **20**
1.5 Details of the Environmental Assessment Practitioner and Expertise to conduct the BA process **20**
CHAPTER 2: PROJECT DESCRIPTION **23**
2.1. Legal Requirements as per the EIA Regulations, 2014 (as amended) **23**
2.2 Nature and extent of the Decommissioning of Kriel Power Station's Asbestos Landfill Site **23**
2.2.1 Location and development of Kriel Power Station's Asbestos Landfill Site 23
2.2.2 Current Status and Associated Infrastructure 24
2.3 Need and Desirability of the Decommissioning of Kriel Power Station's Asbestos Landfill Site **30**
2.4 Project Alternatives **30**
2.5 Activity Alternatives **30**
2.6 Site Alternatives **30**
2.7 Technology Alternatives **30**
2.8 The 'Do Nothing' Alternative **31**
CHAPTER 3: POLICY, LEGISLATIVE CONTEXT AND Approach to Undertaking the Basic Assessment Process **32**
3.1 Relevant Legislative Permitting Requirements **32**
3.1.1 National Environmental Management Act (Act No. 107 of 1998) 32
3.1.2 National Environmental Management Waste Act (Act No. 59 of 2008) 33
3.1.3 Hazardous Substances Act (Act No. 15 of 1973) 33
3.1.4 Labour Asbestos Regulations Act (Act No. 155 of 2002) 34
3.1.5 Occupational Health and Safety Act (Act No. 85 of 1993) (OSHAS) 34
3.2 Legislation and Guidelines that have informed the preparation of this Basic Assessment Report **34**
3.3 Overview of the Basic Assessment Process for the Decommissioning of Kriel Power Station's Asbestos Landfill Site **39**
3.3.1 Authority Consultation and Application for Authorisation in terms of the 2014 EIA Regulations (as amended) 39
3.3.2 Public Participation Process 39
3.3.3 Assessment of Issues Identified through the BA Process 45
3.4 Assumptions and Limitations of the BA Process **45**
CHAPTER 4: DESCRIPTION OF THE RECEIVING ENVIRONMENT **46**
4.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report **46**

4.2 Regional Setting: Location of the Asbestos Landfill Site 46
4.3 Existing Land-Use 47
4.4 Climatic Conditions 47
4.5 Topography & Hydrology 47
4.6 Geology 48
4.7 Vegetation 49
4.8 Heritage Resources 49
4.9 Palaeontology 50
4.10 Social and Economic Characteristics of the Kriel Power Station 50
4.10.1 Demographics 50
4.10.2 Education 50
CHAPTER 5: ASSESSMENT OF IMPACTS AND CUMULATIVE IMPACTS 52
5.1 Decommissioning Activities 52
5.2 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report 52
5.3 Impact Assessment Methodology 55
5.4 Decommissioning Phase Impacts 56
5.4.1 Description of Groundwater and Surface Water Impacts 56
5.4.2 Impact tables summarising the significance of groundwater, surface water and soil contamination impacts during the decommissioning of the asbestos landfill site at the Kriel Power Station (with and without mitigation) 57
5.4.3 Implications for Project Implementation 59
5.5 Assessment of the 'Do Nothing' Alternative 59
CHAPTER 6: CONCLUSION AND RECOMMENDATIONS 60
6.1. Legal Requirements as per the EIA Regulations, 2014 (as amended) 60
6.2. Evaluation of the Decommissioning of the Asbestos Landfill Site 60
6.2.1 Impacts on Groundwater Quality 61
6.2.2 Impacts on Surface Water and Soil Contamination 61
6.2.3 Assessment of Cumulative Impacts 62
6.3. Desktop Environmental Sensitivity of Asbestos Landfill Site 62
6.5. Environmental Costs and Benefits associated with the Decommissioning of Kriel Power Station's Asbestos Landfill Site 64
6.7. Overall Recommendation 65
CHAPTER 7: REFERENCES 66

APPENDICES

Appendix A: Project Team Curricula Vitae
Appendix B: Correspondence with Authorities
Appendix C: Public Participation Information
Appendix C1: I&AP Database
Appendix C2: Site Notices and Newspaper Advertisements
Appendix C3: Organs of State Correspondence
Appendix C4: Interested and Affected Party Correspondence
Appendix C5: Comments Received
Appendix C6: Minutes of Meetings
Appendix C7: Comments and Responses Report
Appendix D: Closure Plan
Appendix E: Kriel Asbestos Landfill Site Permit – B33/2/200/71/P21
Appendix F: A3 Maps

DEFINITIONS AND TERMINOLOGY

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

Commence: The start of any physical activity, including site preparation and any other activity on site which triggers 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.

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Decommissioning: 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. This usually occurs at the end of the life of a facility.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation, or maintenance of an activity and are generally obvious and quantifiable.

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Emergency: An undesired/ unplanned event that results in a significant environmental impact and requires the notification of the relevant statutory body, such as a local authority.

Environment: the surroundings within which humans exist and that are made up of:

i. The land, water and atmosphere of the earth;
ii. Micro-organisms, plant and animal life;
iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental impact assessment: Environmental Impact Assessment, as defined in the NEMA EIA Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme: An operational plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Hazardous waste: Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

Indirect impacts: Indirect or induced changes that may occur because of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place because of the activity.

Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

No-go areas: Areas of environmental sensitivity that should not be impacted on or utilised during the development of a project as identified in any environmental reports.

Pollution: A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances.

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.

Waste: Any substance, whether or not that substance can be reduced, re-used, recycled and recovered-

(a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
(b) which the generator has no further use of for the purposes of production;
(c) that must be treated or disposed of; or
(d) that is identified by the Minister by notice in the Gazette.

and includes waste generated by the mining, medical or other sector, but –

(i) a by-product is not considered waste; and
(ii) any portion of waste once re-used, recycled and recovered, ceases to be waste.

ABBREVIATIONS AND ACRONYMS

BA	Basic Assessment
BAR	Basic Assessment Report
DAFF	Department of Forestry and Fishery
DEA	National Department of Environmental Affairs
DWAF	Department of Water and Forestry
DWS	Department of Water and Sanitation
ECA	Environmental Conservation Act (Act No. 73 of 1989)
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GIS	Geographical Information Systems
GG	Government Gazette
GN	Government Notice
Ha	Hectare
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
km^2	Square kilometres
KPS	Kriel Power Station
m^2	Square meters
m^3	Cubic meters
MDEDET	Mpumalanga Department of Economic Development and Tourism
MW	Mega Watt
NDM	Nkangala District Municipality
NDMSPDF	Nkangala District Municipality Spatial Development Framework
NEMA	National Environmental Management Act (Act No 107 of 1998)
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act (Act No 25 of 1999)
NGOs	Non-Governmental Organisations
NWA	National Water Act (Act No 36 of 1998)
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency Limited
SDF	Spatial Development Framework
SOC	State Owned Company
WML	Waste Management Licence

CHAPTER 1: INTRODUCTION

Eskom Holdings SOC Ltd is proposing the decommissioning of an asbestos landfill site at the Kriel Power Station (KPS) located ~8km west of Kriel, 27km south of Ogies and 34km north-west of Bethal, in the Mpumalanga Province. The project is known as the **Decommissioning of the Kriel Power Station Asbestos Landfill Site** and will fall within the jurisdiction of the Nkangala District Municipality (NDM) and the eMalahleni Local Municipality (ELM) in the Mpumalanga Province. The asbestos landfill site is located approximately 1.76km south of the generation units of the KPS, ~4.63km east of the units at the Matla Power Station and 2.4km north of Ash Dam 2 within the KPS development footprint.

The asbestos landfill site was established on the northern boundary of the existing Ash Dam 1, with a total extent of approximately 2.34ha for the disposal of asbestos waste and asbestos-containing waste, generated during the commissioning of the power station in the early 1970s. At present, the disposal landfill site is approximately 300m above sea level, in addition, the asbestos disposal site was permitted in accordance with section 20 of the Environmental Conservation Act (Act No. 73 of 1989). The site is no longer in operation as it was last used for the disposal of asbestos waste in June 2008. In the following years, continued ash disposal over the site has enclosed the site entirely within the existing Ash Dam 1, and as such the site is not exposed at all presently, but rather buried under numerous thick layers of disposed process ash. Since June 2008, KPS has also disposed of asbestos-containing waste at external licensed disposal sites such as Platkop and Holfontein. The asbestos disposal site must therefore be decommissioned in accordance with the National Environmental Management: Waste Act (Act No. 59 of 2008), GN R921 of the National Environmental Management Waste Act (Act No. 59 of 2008) as amended, and the EIA Regulations of 2014 (as amended).

The nature and extent of the asbestos landfill site, as well as the potential environmental impacts associated with its decommissioning, are explored in detail in this Basic Assessment (BA) Report. Site-specific environmental issues are assessed within this BA Report in order to evaluate the environmental impact of the KPS development footprint for the decommissioning of the asbestos disposal site.

This Final Basic Assessment (BA) Report has been prepared in accordance with the requirements of Appendix 1 of the EIA Regulations published on 08 December 2014 (as amended in April 2017) promulgated in terms of Chapter 5 of the National Environmental Management Act (Act No 107 of 1998). This Report consists of the following sections:

- **Chapter 1** provides a background to the Kriel Power Station Asbestos Landfill Site and the basic assessment process.
- **Chapter 2** provides a description of the asbestos landfill site area and the need and desirability of the decommissioning of the site.
- **Chapter 3** outlines the approach to undertaking the basic assessment process.
- **Chapter 4** describes the existing biophysical and socio-economic environment within and surrounding the Kriel Power Station.
- **Chapter 5** provides an assessment of the potential issues and impacts associated with the proposed pipeline corridor and presents recommendations for the mitigation of significant impacts.
- **Chapter 6** presents the conclusions and recommendations based on the findings of the BA Report.

» **Chapter 7** provides references used in the compilation of the BA Report.

This Chapter of the BA Report includes the following information required in terms of Appendix 1:

Requirement	Relevant Section
3(a) the details of the (i) EAP who prepared the report and (ii) the expertise of the EAP, including a curriculum vitae.	The details of the EAP who prepared the report and the expertise of the EAP is included in **Section 1.5**. The curriculum vitae of the EAP, project team and independent specialists are included in **Appendix A**.
3(b) the location of the activity including (i) the 21 digit Surveyor General code of each cadastral land parcel, (ii) where available the physical address and farm name and (iii) where the required information in items (i) and (ii) is not available, the co-ordinates of the boundary of the property or properties.	The location of the asbestos landfill site is included in **Chapter 2**, **Section 2.2.1** and **Figure 2.1**. The information provided includes the 21-digit Surveyor General code of the affected properties and the farm names. Additional information is also provided regarding the location of the development which includes the relevant province, local and district municipalities, ward and current land zoning.

1.1 Overview of the Decommissioning of the Kriel Power Station's Asbestos Landfill Site

Eskom Holdings SOC Limited is proposing the decommissioning of the Kriel Power Station Asbestos Landfill site, which is entirely contained within Ash Dam 1 boundaries in the Mpumalanga Province (i.e. the asbestos site is located completely within the ash dam site). The landfill site has an extent of 2.34ha, whereas Ash Dam 1 has an extent of ~ 200ha. The landfill site is located approximately 1.76km south of the KPS generation units in the Mpumalanga Province. No additional infrastructure will be decommissioned along with the asbestos landfill site. Furthermore, no alternative areas are assessed within this BA Report, and no new access roads will be required for the decommissioning of the asbestos landfill site, as existing roads used to access Ash Dam 1 will be used to provide access to the asbestos landfill site during monitoring periods, and the decommissioning activities can only occur on the existing facility, which logically has a fixed location and therefore location alternatives are not feasible.

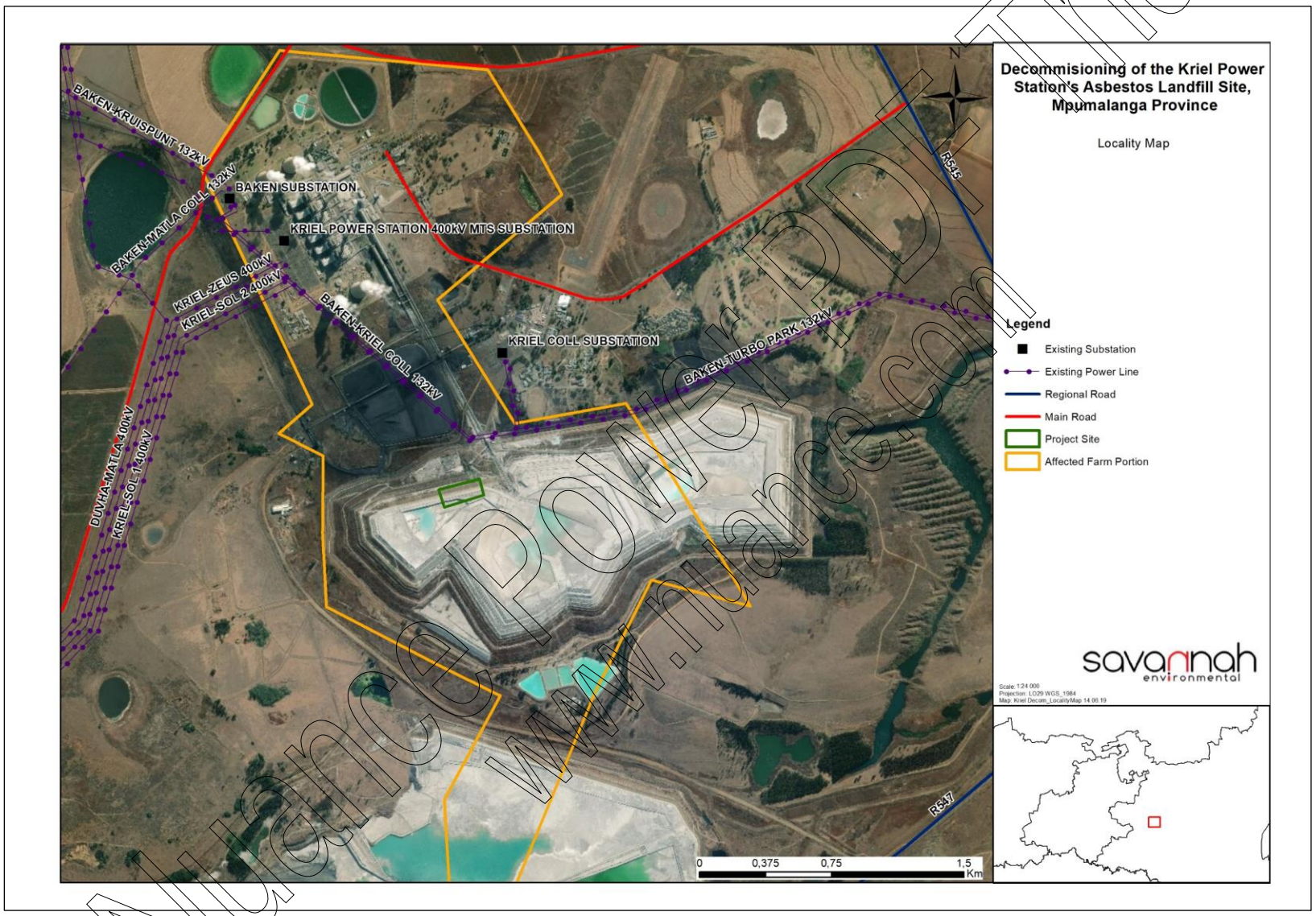

Figure 1.1: A locality map showing the locality of the asbestos landfill site within Ash Dam 1 at the Kriel Power Station, Mpumalanga Province

1.2 Requirements for a Basic Assessment Process

The decommissioning of the asbestos landfill site within the Kriel Power Station is subject to requirements of the EIA regulations of the EIA Regulations, 2014 (as amended), published in terms of Section 24(5) of the National Environmental Management Act (NEMA) 107 of 1998. The NEMA is the national legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed, and reported on to the Competent Authority (the decision-maker) charged by NEMA with granting of the relevant waste management licences and environmental authorisations.

In terms of Section 3 of GN R921 of the Waste Management Act (Act No. 59 of 2008), the decommissioning of the asbestos landfill site is subject to a BA process in accordance with the EIA Regulations of 2014 (as amended on 07 April 2017) promulgated under Sections 34 and 24D of the NEMA. The main waste listed activity triggered by the decommissioning of the asbestos landfill site is Activity 3 (14) of the List of Waste Management Activities, 2013 (as amended), which relates to the decommissioning of a facility for a waste management activity listed in Category A or B of GN R921.

Due to the triggering of Activity 3 (14) of GN R921, of the List of Waste Management Activities, 2013 (as amended), a BA process must be undertaken in order to obtain a waste management licence and for the decommissioning of the asbestos landfill within Ash Dam 1 at the Kriel Power Station. The application for a waste management licence (WML) for this project is therefore supported by a BA process.

1.3 Overview of the Basic Assessment (BA) Process

A BA is an effective planning and decision-making tool for the project developer as it allows for the identification and management of potential environmental impacts. It provides the opportunity for the developer to be forewarned of potential environmental issues and allows for resolution of the issues reported on in the BA Report as well as dialogue with interested and affected parties (I&APs).

The BA process comprises one phase and involves the identification and assessment of environmental impacts as well as public participation. The process followed in the Basic Assessment involves a detailed assessment of potentially significant positive and negative impacts (direct, indirect, and cumulative). This includes detailed specialist investigations and one round of public consultation. Following the public review period of the BA Report and Environmental Management Programme (EMPr), a final BA Report and an EMPr is submitted to the Competent Authority, which includes the recommendations for practical and achievable mitigation and management measures for final review and decision-making.

The need to comply with the requirements of the EIA Regulations ensures that the competent authority is provided with the opportunity to consider the potential environmental impacts of a project early in the project development process and to assess if potential environmental impacts can be avoided, minimised or mitigated to acceptable levels.

A site-specific environmental assessment of the Kriel Power Station - in particular the Asbestos Landfill site - has been undertaken during the BA process. A comprehensive and independent environmental study was required in accordance with the EIA Regulations to provide the Competent Authority with enough information in order to make an informed decision.

1.4 Objectives of the Basic Assessment Process

Appendix 1 of the EIA Regulations, 2014 (as amended), contains the objectives to be achieved through the undertaking of a BA process. The following objectives have been considered, undertaken and achieved through a consultative process within this Final BA Report for the Decommissioning of Kriel Power Station's Asbestos Landfill Site:

- The identification and consideration of the policies and legislative context associated with the location of the asbestos landfill site, and the way the decommissioning of the site complies with and responds to the relevant policies and legislative context.
- The consideration of the need and the desirability for the decommissioning of the asbestos landfill site.
- The identification and consideration of the nature, consequence, extent, duration and probability of the impacts associated with the decommissioning of the asbestos landfill site, as well as the degree to which the potential impacts can be reversed, result in irreplaceable loss of resources and be avoided, managed or mitigated.
- Motivation for the decommissioning of the site at the Kriel Power Station, Mpumalanga.
- Consideration and identification of the environmental sensitivities to provide input in terms of measures to avoid, manage and mitigate the impacts and the residual risks that need to be managed and monitored.

The release of the BA Report for a 30-day review period was to provide stakeholders with an opportunity to review and provide input in terms of potential issues and concerns that may be associated with the decommissioning of the asbestos landfill site at the Kriel Power Station. This Final BA Report for submission to the DEA considers and incorporates comments and responses raised during the review period of the BA Report. The DEA will, therefore, take the comments and responses into consideration in their decision-making of the application for a Waste Management Licence.

1.5 Details of the Environmental Assessment Practitioner and Expertise to conduct the BA process

In accordance with Regulation 12 of the 2014 EIA Regulations (GN R326) Eskom Holdings SOC Ltd has appointed Savannah Environmental (Pty) Ltd (Savannah Environmental) as the independent Environmental consultant to undertake the Basic Assessment and prepare the BA Report for the Decommissioning of the Asbestos Landfill Site at the Kriel Power Station. Neither Savannah Environmental nor any of its project team members are subsidiaries of, or are affiliated to Eskom Holdings SOC Ltd. Furthermore, Savannah Environmental does not have any interests in secondary development that may arise out of the authorisation of the decommissioning of the asbestos landfill site.

Savannah Environmental is a leading provider of integrated environmental and social consulting, advisory and management services with considerable experience in the fields of environmental assessment and management. The company is wholly woman-owned (51% black woman-owned) and is rated as a Level 2

Broad-based Black Economic Empowerment (B-BBEE) Contributor. The company was established in 2006 with a clear objective to provide services to the infrastructure development sector. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team that has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa and neighbouring countries. Strong competencies have been developed in project management of environmental processes, as well as strategic environmental assessment and compliance advice, and the assessment of environmental impacts, the identification of environmental management solutions and mitigation/risk minimising measures.

The Savannah Environmental team has considerable experience in environmental impact assessments and environmental management and has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa, including those associated with infrastructure development projects.

The Savannah Environmental team in this project includes:

» **Reuben Maroga** is the principal author of this Report. He holds a Bachelor degree in Environmental Management and an Honours degree in Geology and has 2.5 years of experience in the environmental management field. His key focus is on undertaking environmental impact assessments, public participation, environmental management plans and programmes.

» **Gideon Raath** is the co-author of this Report. He holds an MSc degree in Environmental Management and Geography from the University of Stellenbosch. He has 5 years' experience consulting in the environmental field. His competencies are in environmental impact assessments, mainly within the renewable energy (wind and solar) sector as well as for infrastructure (roads, water pipelines and power line) related projects.

» **Jo-Anne Thomas** is a Director at Savannah Environmental (Pty) Ltd and the registered EAP for the EIA for this project. Jo-Anne holds a Master of Science Degree in Botany (M.Sc. Botany) from the University of the Witwatersrand and is registered as a Professional Natural Scientist (400024/2000) with the South African Council for Natural Scientific Professions (SACNASP). She has over 20 years of experience in the field of environmental assessment and management, and the management of large environmental assessment and management projects. During this time, she has managed and coordinated a multitude of large-scale infrastructure EIAs and is also well versed in the management and leadership of teams of specialist consultants, and dynamic stakeholders. Jo-Anne has been responsible for providing technical input for projects in the environmental management field, specialising in Strategic Environmental Advice, EIA studies, environmental permitting, public participation, EMPs and EMPrs, environmental policy, strategy and guideline formulation, and integrated environmental management (IEM). Her responsibilities for environmental studies include project management, review and integration of specialist studies, identification and assessment of potential negative environmental impacts and benefits, and the identification of mitigation measures, and compilation of reports in accordance with applicable environmental legislation.

» **Nicolene Venter** is a Board Member of IAPSA (International Association for Public Participation South Africa. She holds a Higher Secretarial Diploma and has over 21 years of experience in public participation, stakeholder engagement, awareness creation processes and facilitation of various

meetings (focus group, public meetings, workshops, etc.). She is responsible for project management of public participation processes for a wide range of environmental projects across South Africa and neighbouring countries.

Curricula Vitae (CVs) detailing Savannah Environmental team's expertise and relevant experience are provided in **Appendix A**.

CHAPTER 2: PROJECT DESCRIPTION

This chapter provides an overview of the Decommissioning of Kriel Power Station's Asbestos Landfill Site and details the project scope, which only includes the decommissioning of the asbestos landfill site within Ash Dam 1.

2.1. Legal Requirements as per the EIA Regulations, 2014 (as amended)

This chapter of the BA report includes the following information required in terms of the EIA Regulations, 2014 (as amended) Appendix 1: Content of Basic Assessment reports:

Requirement	Relevant Section
3(b) the location of the activity including (i) the 21 digit Surveyor General code of each cadastral land parcel, (ii) where available the physical address and farm name and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	The location of the asbestos landfill site within Ash Dam 1 at the Kriel Power Station is described in **Chapter 2, Section 2.2.1** in **Table 2.1** and **Figure 2.1**.
3(c)(i)(ii) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or on land where the property has not been defined, the coordinates within which the activity is to be undertaken	A layout map illustrating the asbestos landfill site is included in **Figure 2.1**.
3(d)(ii) a description of the scope of the proposed activity, including a description of the activities to be undertaken including associated structures and infrastructure	A description of the scope of the decommissioning of the asbestos landfill site at the Kriel Power Station and the infrastructure associated with the site is included in sections **2.2.1** and **2.2.2**

2.2 Nature and extent of the Decommissioning of Kriel Power Station's Asbestos Landfill Site

Eskom Holdings SOC Ltd is proposing the decommissioning of an asbestos landfill site within Ash Dam 1 at the Kriel Power Station in the Mpumalanga Province. The landfill was licensed under Section 20 (1) of the Environmental Conservation Act (ECA) (Act No. 73 of 1989), with the reference B33/2/200/71/P21(which allowed the power station to dispose of and bury asbestos waste within the landfill at Ash Dam 1. At present-day, the asbestos landfill site is overlain by a succession of ash layers making up Ash Dam 1 at the station.

2.2.1 Location and development of Kriel Power Station's Asbestos Landfill Site

The asbestos landfill site is located along the northern boundary of Ash Dam 1 (**Figure 2.1**). The landfill site occupies an area of approximately 2.34ha and is 30m wide and 30m long with an approximate capacity of 1500m^3 which was then sufficient to accommodate asbestos waste for 30 years. The asbestos waste was generated when asbestos material was stripped from various areas around the Kriel Power Station (i.e. ceilings, office structures, insulation materials etc.), as part of Eskom's Asbestos Phase Out Programme. The site was developed in the form of a void (using tractor loader backhoes) to accommodate multiple cells

within which the double-lined, impermeable and heavy-duty plastic bags containing asbestos waste, were disposed of (**Figure 2.2**). The cells were 10m long and 5m wide and located 1.5m deep from the surface of the surrounding ash. Each cell had a capacity of 70m^3. For the period, 1992 – 2008 approximately 50m^3 of asbestos waste were disposed of per year within the cells at the landfill site.

Table 2.1: A detailed description of Asbestos Landfill Site at the Kriel Power Station

Province	Mpumalanga Province
District Municipality	Nkangala District Municipality
Local Municipality	eMalahleni Local Municipality
Ward number(s)	24
Nearest town(s)	The Kriel Power Station is located ~8km west of Kriel, 27km south of Ogies and 34km north-west of Bethal.
Farm Name(s) & Portion Number (s)	Portion 0 of Kriel Power Station 65 IS
SG 21 Digit Code (s)	T0IS00000000006500000
Current zoning	Agriculture

Once disposed of inside the cell, the bags were backfilled into two compacted layers to provide a 700m layer/cover over the bags. A final backfill layer of 300mm was carefully placed in order to take full advantage of the pozzolanic or cementing characteristics of the ash, thereby sealing the surface of the cell. This process was repeated every six (6) months. Refer to **Figure 2.4** below.

Following the creation of the void, the distance of the asbestos disposal site to the outer wall of Ash Dam 1 was not less than 200m, and the underlying ash layer was not less than 6m in thickness. This greatly minimised seepage migration into the groundwater system at Kriel Power Station. Furthermore, Ash Dam 1 has been constructed on a predominant sandstone and shale lithology which is overlain by a sandy clay layer between 3 – 4m thick. This layer contains significant attenuation properties which further minimise seepage migration into the groundwater system.

Due to the cementing character of the compressed ash, it created a compact ash layer which greatly minimised seepage to the underlying bedrock. Therefore, it is not anticipated that any leachate from the asbestos landfill site would reach the exterior section of Ash Dam 1 or any underdrainage systems in the area. Nevertheless, if any leachate was to occur, the existing dirty water system is self-contained with ash water being returned back to Ash Dam 1 via the power station.

2.2.2 *Current Status and Associated Infrastructure*

Ash Dam 1 and the Asbestos Landfill Site can be accessed by a two-way dirt road which approaches the ash dam from an easterly direction (**Figure 2.2**). Current activities taking place on this section of the power station include the ongoing disposal of process ash in the form of ash sludge, pumped onto the dam through numerous spigots located at strategic locations depending on current fill levels, as well as, minor reshaping of the surface by a back actor. The ash dam has a storm and surface water drainage system which has been implemented to manage all drainage from all side of the ash dam, with all stormwater contained on the surface of the ash dam allowed to dry along with the deposited ash sludge/slurry. In addition, a groundwater monitoring programme has been put in place for the power station (including the ash dam) in order to continuously monitor groundwater levels and quality at the station.

Currently, Ash Dam 1 has an operational life span of three (3) years, following which an application for an extension will be submitted to the relevant authority for the ongoing operation of the dam or it will be decommissioned for appropriate closure. The complete operation of the ash dam is envisaged for December 2023 following which the following summarised maintenance activities will be employed, for approximately 2 – 10 years depending on the effectiveness of the measures implemented. The following rehabilitation activities will be undertaken for Ash Dam 1:

- Gradual shaping of side slopes of the ash dam;
- Transportation of topsoil to the require locations;
- Gradual spreading of topsoil to cover the shape ash dam side slopes;
- Planting of grass for erosion control on prepared slopes;
- Establishment of veld grass, indigenous tree and shrubs on the prepared areas; and
- The aftercare of rehabilitated areas to ensure continued stability and eventual self-sustainability.

Figure 2.2 and **2.3** below include photographs which illustrate the current state of the asbestos landfill site with the Ash Dam and the associated infrastructure present.

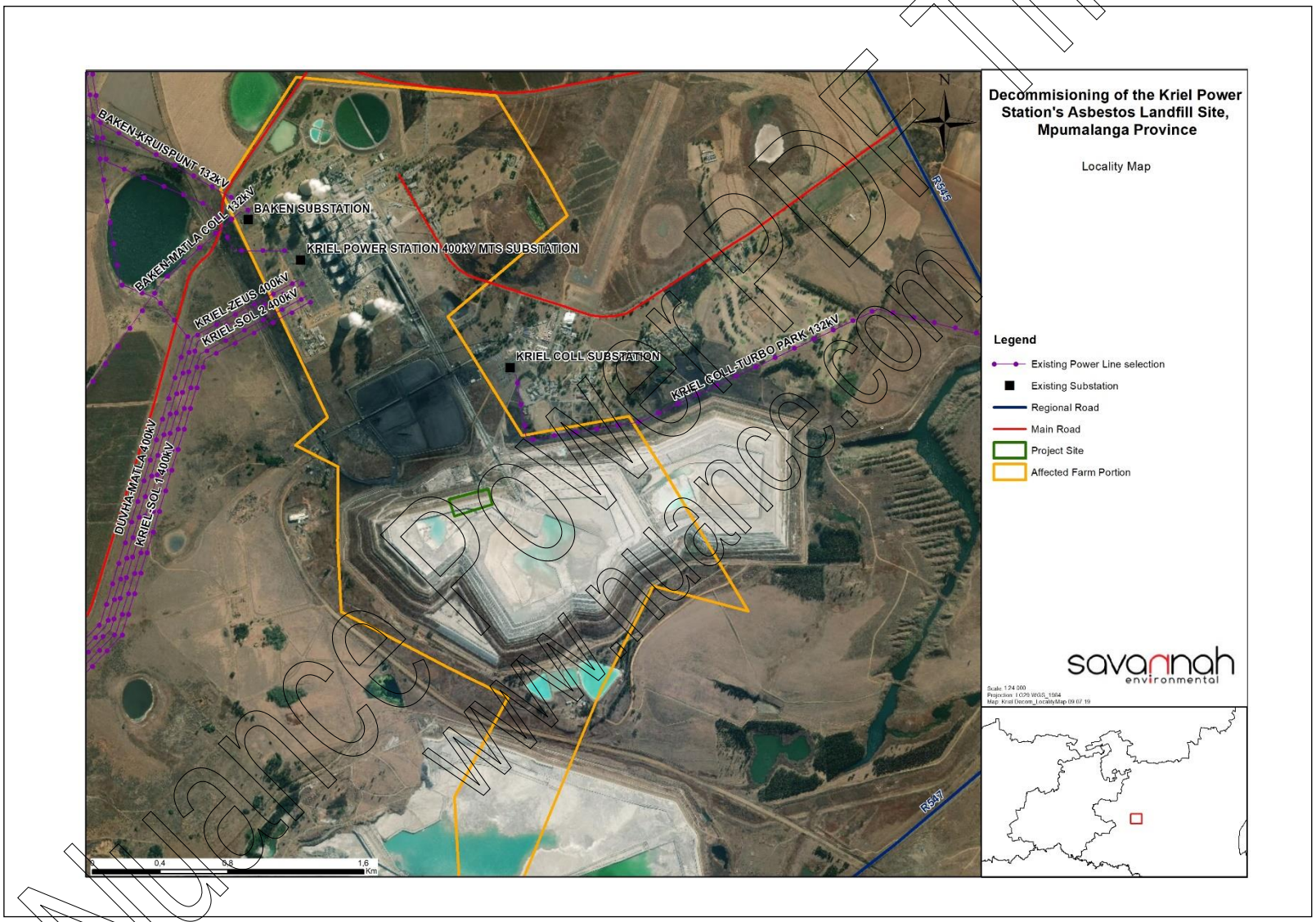

Figure 2.1: A locality map showing the location of the Asbestos Landfill Site within Ash Dam 1 at the Kriel Power Station.

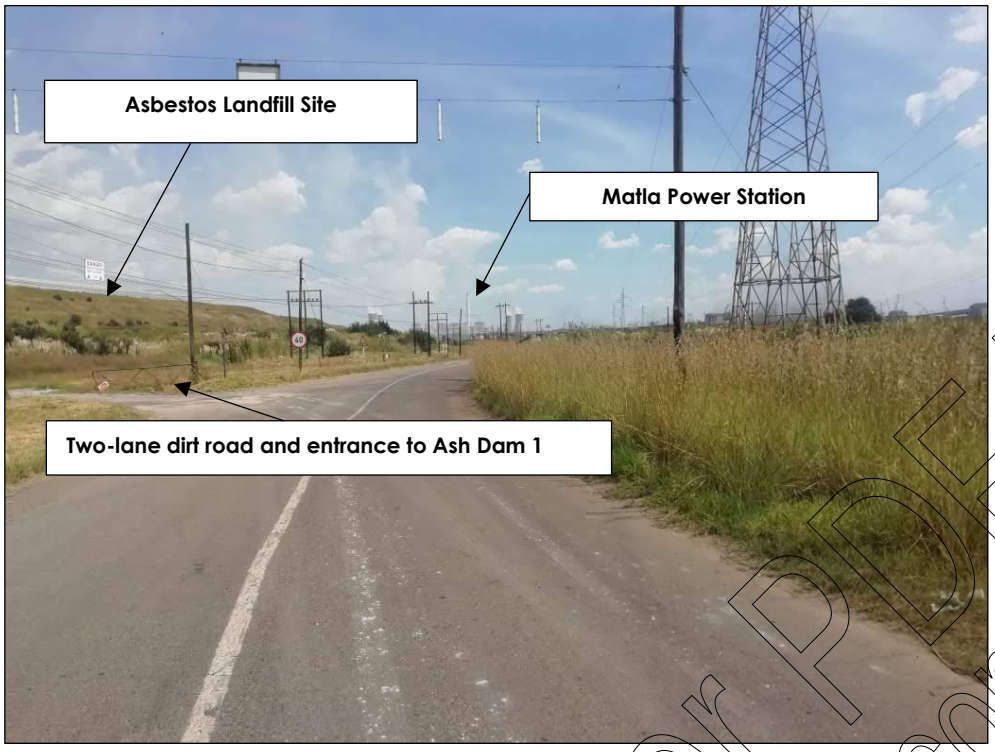

Figure 2.2: A photograph illustrating the existing infrastructure surrounding the Ash Dam 1 and the Asbestos Landfill Site at the Kriel Power Station.

Figure 2.3: A photograph illustrating the nature of the Asbestos Landfill Site at present. The landfill is completely encapsulated by a cement pavement which comes from the pozzolanic property associated with the ash slurry/sludge.

The ash dam is presently fenced, with access to the site only being granted via a gate near the entrance to Ash Dam 1 (as shown in **Figure 2.2**). Only appropriate personnel are allowed on site and in accordance with ongoing operation and maintenance actions only.

An existing licence issued by the then Department of Water Affairs and Forestry (DWAF) in 1992 (Ref: B33/2/200/71) governs the Asbestos Landfill Site, which remained in use since the cessation of disposing asbestos at this facility in June 2008. Some of the conditions required within the licence include the following:

- Weatherproof, durable and legible notices in both official languages shall be displayed at each entrance to the site. These notices shall prohibit unauthorised entry and state the hours of operation, the name, address and telephone details of the Permit Holder and the person responsible for the operation of the site;
- The Permit Holder shall ensure effective access control; and
- The Permit Holder shall take all reasonable steps to prevent the disposal of waste on the site for which the site has not been approved.

Eskom have since 2008 however, ceased use of the asbestos landfill site and it, therefore, no longer serves an operational purpose. As part of ongoing improvements and efforts to increase efficiency at the Kriel Power Station, the decommissioning of the asbestos landfill site was earmarked as a potential means of reducing cost, legislative and operational burden. To this end, Eskom have appointed Savannah Environmental (Pty) Ltd to undertake the BA process and the application for a waste management licence for the decommissioning of the Asbestos Landfill Site.

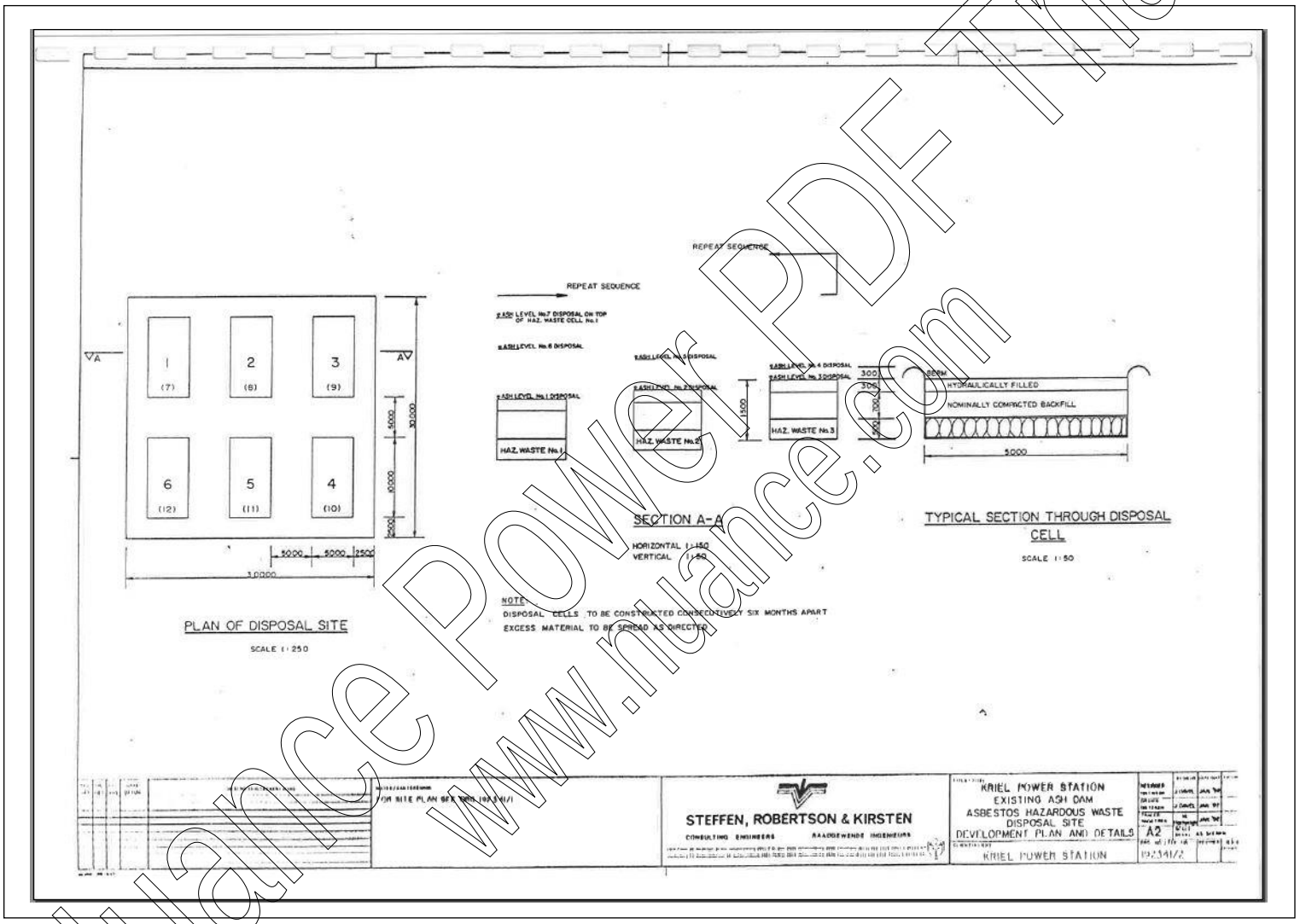

Figure 2.4: A view of the cross-section drawing illustrating the cells utilised to accommodate asbestos waste within the Asbestos Landfill Site.

2.3 Need and Desirability of the Decommissioning of Kriel Power Station's Asbestos Landfill Site

The asbestos landfill site at the power station is no longer in use and the asbestos waste being generated at the power station is being removed by a licenced service provider to a licensed asbestos disposal facility. Therefore, the asbestos landfill site within Ash Dam 1 must be decommissioned in accordance with the legal requirements for waste facility decommissioning.

2.4 Project Alternatives

According to the requirements outlined in Appendix 2 of the 2014 EIA Regulations (as amended), the consideration of alternatives including the site, activity, as well the 'do nothing' alternative should be undertaken. In relation to an activity, alternatives refer to the different ways of meeting the general requirements of a proposed activity, therefore, the following sections address this requirement in terms of the Decommissioning of Kriel Power Station's Asbestos Landfill Site.

2.5 Activity Alternatives

The proposed decommissioning of the asbestos landfill site at the Kriel Power Station will not amount to any construction-related activities being undertaken on the site. This follows that the site is entirely encapsulated within the layers of Ash Dam 1. Therefore, no alternative activities to be undertaken for the decommissioning of the asbestos landfill site are considered.

2.6 Site Alternatives

The asbestos landfill site to be decommissioned is located within the existing footprint of the Kriel Power Station at Ash Dam 1. By virtue of this being a decommissioning project, no alternative sites may be decommissioned. Thus, no alternative sites for the proposed activity are assessed within this BA process and report.

2.7 Technology Alternatives

Wet ash from the units at the Kriel Power Station has been disposed of at Ash Dam 1 since 2008. The wet ash has solidified over time, forming a solid 'concrete cap' for the asbestos waste contained within the ash dam, completely enclosing the asbestos site. As the ash is encapsulated within Ash Dam 1, no further technology alternatives are assessed in this BA report. The on-going disposal of ash at Ash Dam 1 ensures the asbestos waste is continually and increasingly encapsulated and that safety is achieved. Ash Dam 1 will be capped once it has reached its maximum height. In addition, no technology alternative is regarded feasible as the asbestos site is no longer in use and thus not currently operational. No alternative means of storage of asbestos if thus envisaged. Furthermore, considering the current buried status of the asbestos site, no better decommission technology was available as all efforts to expose the site will likely incur greater environmental impact.

2.8 The 'Do Nothing' Alternative

The EIA Regulations prescribe that within any BA process, the **'Do Nothing'** alternative option be considered. This alternative is the option of not decommissioning the asbestos landfill site within Ash Dam 1, and it would mean the station continues to comply with the asbestos permit conditions under which the facility was initially authorised, and which have become an operational liability to Eskom Holdings and Kriel Power Station. Therefore, the **'Do Nothing'** alternative further means the facility will not be decommissioned rendering the proponent non-compliant with changing environmental regulations, requiring closure in the future – which is what this decommissioning project aims to achieve.

CHAPTER 3: POLICY, LEGISLATIVE CONTEXT AND APPROACH TO UNDERTAKING THE BASIC ASSESSMENT PROCESS

In terms of GN R921 of November 2013, published in terms of NEMWA (Act No. 59 of 2008), the Decommissioning of the Kriel Power Station Asbestos Landfill Site is a listed activity requiring the undertaking of a basic assessment process in accordance with the EIA Regulations of 2014 (as amended). Due to the triggering of Activity 14(3) within Category A of GN R921, a BA process must be undertaken in support of the application for a waste management license.

The BA process aims at identifying and describing potential environmental issues associated with the decommissioning of the asbestos landfill site within Kriel Power Station. The process aims to ensure that a comprehensive assessment is provided to the competent authority and I&APs regarding the potential impacts associated with the decommissioning of the asbestos landfill site. In addition, a comprehensive consultation process has commenced, and includes I&APs, the competent authority, adjacent landowners/occupiers, relevant Organs of State departments, ward councillors and other key stakeholders. This chapter serves to outline the BA process followed in compilation of this BA Report.

This Chapter of the BA Report includes the following information required in terms of Appendix 1:

Requirement	Relevant Section
3(d)(i) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for.	The listed activity triggered as a result of the Decommissioning of Kriel Power Station's Asbestos Landfill Site is included in **section 3.1**, **Table 3.1.**
3(h)(ii) details of the public participation process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs.	The details of the public participation process undertaken for the decommissioning of the asbestos landfill site has been included and described in **section 3.3.2**.
3(h)(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.	The methodology used to assess the significance of the impacts of the decommissioning of the asbestos landfill site is included in **Chapter 5** of this BA Report.

3.1 Relevant Legislative Permitting Requirements

The legislative permitting and policy requirements applicable to the Decommissioning of Kriel Power Station's Asbestos Landfill Site as identified at this stage in the process, are discussed in more detail in the following sections, along with the provincial and local policies/plans that have relevance to the decommissioning of the asbestos landfill site at the Kriel Power Station.

3.1.1 National Environmental Management Act (Act No. 107 of 1998)

The BA Report for the decommissioning of the asbestos landfill site at the Kriel Power Station was undertaken in accordance with the EIA Regulations of 2014 (as amended), promulgated in terms of section 24(5) of the Act. The National Department of Environmental Affairs (DEA) is the competent authority responsible for the issuance of the waste management licence. Furthermore, the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET), is the commenting authority.

In terms of the EIA Regulations of 2014 (as amended), the proposed activity does not trigger any listed activities within published notices. However, the BA process outlined in this Chapter is undertaken in accordance with the information requirements of Appendix 1 in the EIA Regulations of 2014 (as amended).

3.1.2 National Environmental Management Waste Act (Act No. 59 of 2008)

Listed activities previously listed under the EIA Regulations were repealed and now listed under GN R921 of the National Waste Management Act (Act No. 59 of 2008). The List of Waste Management Activities (GN R921), that have, or are likely to have, a detrimental effect on the environment include waste management activities that require an integrated environmental authorisation. The regulations comprise of two (2) categories, namely **Category A** (which includes a list of waste management activities that require a BA process), **Category B** (which includes a list of waste management activities which require a full S&EIR process), and **Category C** (which requires compliance with the relevant waste norms and standards determined by the Minister).

Table 3.1 below details the listed activity in terms of GN R921 of November 2013 that applies to the Decommissioning of Kriel Power Station's Asbestos Landfill Site, and for which an application for a waste management licence is being submitted (this application). The table also includes a description of the specific project activity which relates to the applicable listed activity.

Table 3.1: The Listed Activity as per GN R921 of November 2013, triggered by the proposed decommissioning of the asbestos landfill site within Ash Dam 1 at the Kriel Power Station.

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	Describe each listed activity as per project description
GN R921, 29 November 2013	3(14)	The decommissioning of a facility for waste management activity listed in Category A or B of this Schedule. To date the asbestos landfill site was licensed under the ECA Act (73 of 1989), and the existing permit issued (refer to **Appendix E** in this Report), however, the facility is no longer in use and needs to be decommissioned, therefore, the abovementioned activity is applicable. No Category B activities are deemed applicable to this application with only this activity being applicable.

3.1.3 Hazardous Substances Act (Act No. 15 of 1973)

The Hazardous Substances Act (Act No. 15 of 1973) places the onus on the proponent to identify the various groups of hazardous substances which will be used in terms of any development. In addition, identified substances must be classed in terms of SANS:10228 to ensure that they are properly stores and that a Material Safety Data Sheet (MSDS) is available in the event of a spillage or containment breach.

Asbestos waste is a hazardous substance. The asbestos landfill site at the Kriel Power Station contains asbestos waste disposed of in sealed double heavy-duty impermeable plastic bags inside a cell. These bags were carefully placed within a cell inside the landfill site. Following this, the cell was backfilled with two compacted layers to provide a 700m cover over the bags. The final layer, which was approximately 300m thick was carefully placed hydraulically in order to take advantage of the pozzolanic properties of the ash thereby sealing in the surface of the cell. Therefore, the asbestos waste is completely encapsulated within

Ash Dam 1. Should there be any containment breaches, these would be handled in accordance with Kriel Power Station's Waste Management Procedure (RER0221).

3.1.4 Labour Asbestos Regulations Act (Act No. 155 of 2002)

The South African Department of Labour Asbestos Regulations Act (Act No. 155 of 2002) prohibits an employer or a self-employed individual from carrying out work that will put any person at risk from asbestos exposure. The regulations also require that, where asbestos forms part of a building, plant or premises, steps should be taken to ensure that asbestos is identified and that any potential exposure of any person to the fibres is prevented or adequately controlled. Furthermore, no work can take place on asbestos or Asbestos Containing Materials (ACMs) before necessary precaution measures have been taken.

The decommissioning of the asbestos landfill site at the Kriel Power Station will not include any construction-related activities at the site (i.e. excavations etc.). In addition, the asbestos waste is completely encapsulated within Ash Dam 1 at the Kriel Power Station. Therefore, exposure of the station's employees and the general public to asbestos will be minimal.

3.1.5 Occupational Health and Safety Act (Act No. 85 of 1993) (OSHAS)

The Occupational Health and Safety Act (Act No. 85 of 1993) and the published Government Notice Regulations 1179 (published on 25 August 1995) provide for the appropriate handling of hazardous substances, like asbestos in terms of occupational hygiene. These handling measures of hazardous substances include undertaking assessments of the potential of exposure, medical surveillance and issuance of personal protective equipment (PPE) to employees.

The asbestos landfill at the Kriel Power Station is not operational and disposal of asbestos waste at the site ceased in June 2008, which is more than ten (10) years ago. However, the provisions of the regulations contained in GN R1179 and the OSHA will be taken into consideration in terms of transport and handling of asbestos or any hazardous substances associated with the current operations of the Kriel Power Station. This follows that at present, asbestos waste is transported and disposed of at licensed asbestos disposal facilities (Holfontein and Platkop).

3.2 Legislation and Guidelines that have informed the preparation of this Basic Assessment Report

The following legislation and guidelines have informed the scope and content of the BA Report:

- National Environmental Management Act (Act No. 107 of 1998);
- National Environmental Management Waste Act (Act No. 59 of 2008);
- National Environmental Management Act (Act No. 59 of 2008): List of Waste Management Activities That Have, Or Are Likely to Have, A Detrimental Effect on The Environment;
- Labour Asbestos Regulations Act (Act No. 155 of 2002);
- Occupational Health and Safety Act (Act No. 85 of 1993);
- EIA Regulations of December 2014, published under Chapter 5 of NEMA (as amended in GNR R326 in Government Gazette No 40772 of April 2017); and
- Department of Environmental Affairs (2017), Public Participation Guidelines in terms of NEMA EIA Regulations.

Table 3.2 provides an outline of the legislative permitting requirements applicable to the decommissioning of the asbestos landfill site at the Kriel Power Station as identified at this stage in the BA process.

Table 3.2: Relevant policies, legislation, guidelines, and standards applicable to the project

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Legislation			
NEMA (Act No. 107 of 1998)	The Environmental Assessment Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations. In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation. In terms of GN R324, R325, and R327 of 4 December 2014, as amended, an Environmental Impact Assessment Process is required to be undertaken for the proposed project.	Department of Environmental Affairs	Although none of the listed activities identified within GN R324, R325, and R327 are not applicable to the project. A BA process has been followed in accordance with GN R326 published in terms of Chapter 5 of the Act. The BA Report will be submitted to the National Department of Environmental Affairs (DEA) in support of an application for a waste management licence.
	In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised. In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.		This BA process undertaken for this project includes an application for a waste management licence to the Competent Authority, the DEA. Furthermore, no additional permitting requirements are associated with the project, however, the applicant will ensure the necessary measures are taken to prevent any pollution or degradation of the environment in accordance with section 28 (1).
NEMWA (Act No. 59 of 2008)	The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. The Minister may amend the list by – » Adding other waste management activities to the list. » Removing waste management activities from the list.		The decommissioning of a facility for waste management activity listed in Category A or B of this Schedule. To date the asbestos landfill site was licensed under the ECA Act (73 of 1989), and the existing permit issued (refer to **Appendix E** in this Report), however, the

	» Making other changes to the particulars on the list. In terms of the Regulations published in terms of this Act (GN R921), A Basic Assessment is required to be undertaken for identified listed activities.		facility is no longer in use and needs to be decommissioned, therefore, the abovementioned activity is applicable. No Category B activities are deemed applicable to this application with only this activity being applicable.
ECA Act (Act No. 73 of 1989)	The ECA (Act No. 73 of 1989) in Section 20 provides that no person shall establish, provide or operate any disposal site without a permit issued by the Minister of Water Affairs and that Minister may – a. issue a permit subject to such conditions as he may deem fit; b. alter or cancel any permit or condition in a permit; c. refuse to issue a permit.	Department of Environmental Affairs	The disposal of asbestos waste at the landfill site within Ash Dam 1 at the station received authorisation from the then Department of Water Affairs and Forestry in February 1992 (Ref No.: B33/2/200/71).
HSA (Act No. 15 of 1973)	This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances or products.	Department of Health	Asbestos waste is regarded as a hazardous substance. The asbestos landfill site at the Kriel Power Station contains asbestos waste disposed of in double-lined heavy-duty plastic bags buried within cells at the Ash Dam 1. The bags are overlain with a 700mm thick layer which acts as a seal due to the pozzolanic properties of wet ash. However, should there be any containment breaches, these must be handled in accordance with Kriel Power Station's Waste Management Procedure (RER0221).
OSHA (Act No. 85 of 1993): Asbestos Regulations, 2001	S14(1) Where asbestos forms part of the structure of a workplace, building, plant or premises, the employer shall – a. take reasonable steps to ensure that he or she determines the location of asbestos in such workplace, buildings, plant or premises, where that asbestos is likely to release dust that could impact on health or pollute the environment; b. make and maintain a written inventory of the location of asbestos in such workplace, buildings, plant or premises.	Department of Labour	Although, the asbestos landfill site is completely buried/encapsulated by solid ash at Ash Dam 1, the proponent, Eskom Holdings SOC Limited should ensure sign boards around the Ash Dam are placed at conspicuous locations to notify employees and other stakeholders of the locality of the asbestos landfill site within the Ash Dam.

Hazardous Substances Act (Act No 15 of 1973)	This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. **Group I and II**: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance **Group IV**: any electronic product; and **Group V**: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force	Department of Health	Although, asbestos is a hazardous substance, the provisions of this Act will not be applicable in this project due to the waste is no longer handled as the site is not operational. Therefore, it is considered unnecessary to identify and class hazardous materials for this project.

3.3 Overview of the Basic Assessment Process for the Decommissioning of Kriel Power Station's Asbestos Landfill Site

Key tasks undertaken for the BA process include:

- Submission of the completed application for a Waste Management Licence in terms of the National Environmental Management Act (Act No. 107 of 1998) and the National Environmental Management: Waste Act (Act No. 59 of 2008 and Government Notice 921 of November 2013.
- Undertaking a public participation process in accordance with Chapter 6 of GN R326, and the Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations, Department of Environmental Affairs, Pretoria, South Africa (hereinafter referred to as "the Guidelines") in order to identify issues and concerns associated with the proposed project.
- Preparation of a BA Report and a Closure Plan in accordance with the requirements of Appendix 1 and Appendix 5 of GNR326.
- 30-day public and authority review period of the BA report.
- Compilation of a Comment and Responses (C&R) report detailing the comments raised by I&APs, addressing these comments in detail and finalisation of the BA report.
- Submission of a final BA report to the DEA for review and decision-making.

These tasks are discussed in detail in the sub-sections below.

3.3.1 Authority Consultation and Application for Authorisation in terms of the 2014 EIA Regulations (as amended)

In terms of Section 24 of NEMA, the National Department of Environmental Affairs (DEA) has been determined as the Competent Authority for projects which require a waste management licence.

Consultation with the regulating authorities (i.e. DEA) as well as with all other relevant Organs of State will continue throughout the BA process. To date, this consultation has included the following:

- Submission of a completed application for a waste management licence;
- Submission of the BA Report for review and comment by:
  - The competent and commenting authorities; and
  - Organs of State that have jurisdiction in respect of the activity to which the application relates.

3.3.2 Public Participation Process

Public Participation is an essential and regulatory requirement for an environmental authorisation process and is defined by the requirements of Regulations 41 to 44 of the EIA Regulations 2014 (GNR 326) (as amended). The sharing of information forms the basis of the public participation process and offers the opportunity for I&APs (Interested and Affected Parties) to become actively involved in the BA process from the outset. The public participation process is designed to provide sufficient and accessible information to I&APs in an objective manner. The public participation process affords I&APs opportunities to provide input into and receive information regarding the BA process in the following ways:

During the BA process:

- provide an opportunity to submit comments regarding the project;
- assist in identifying reasonable and feasible alternatives;
- contribute relevant local information and knowledge to the environmental assessment;
- allow registered I&APs to verify that their comments have been recorded, considered and addressed, where applicable, in the environmental investigations;
- foster trust and co-operation;
- generate a sense of joint responsibility and ownership of the environment; and
- comment on the findings of the environmental assessments.

During the decision-making phase:

- to advise I&APs of the outcome of the competent authority's decision, and how and by when the decision can be appealed.

The public participation process therefore aims to ensure that:

- Information containing all relevant facts in respect of the application is made available to potential stakeholders and I&APs for their review.
- The information presented during the public participation process is presented in such a manner, i.e. local language and technical issues, that it avoids the possible alienation of the public and prevents them from participating.
- Public participation is facilitated in such a manner that I&APs are provided with a reasonable opportunity to comment on the project.
- Various ways are provided to I&APs to correspond and submit their comments i.e. fax, post, email.
- An adequate review period is provided for I&APs to comment on the findings of the BA Report.

In terms of the requirement of Chapter 6 of the EIA Regulations of December 2014, as amended, the following key public participation tasks are relevant for the current BA process:

- Placement of a site notice at the boundary or on the fence of the site where the activity to which the application relates is or is to be undertaken.
- Give written notice to:
  - (i) the owner or person in control of the land affected by the project (as this is not owned by the applicant);
  - (ii) the occupiers of the site where the activity is proposed to be undertaken;
  - (iii) owners and occupiers of land adjacent to the site where the activity is proposed to be undertaken;
  - (iv) the municipal councillor of the ward in which the site is situated;
  - (v) the municipality which has jurisdiction in the area; and
  - (vi) organ of state having jurisdiction in respect of any aspect of the activity;
- Placement of an advertisement in one local newspaper (i.e. Witbank News).
- Open and maintain a register of I&APs and Organs of State.
- Release a BA Report for a 30-day review period.
- Prepare a Comments and Responses (C&R) report which documents the comments received on the BA process and the responses provided by the project team.

In compliance with the requirements of Chapter 6: Public Participation of the EIA Regulations, 2014 (as amended), the following summarises the key public participation activities conducted to date.

i. Stakeholder Identification and Register of Interested and Affected Parties

42. A proponent or applicant must ensure the opening and maintenance of a register of I&APs and submit such a register to the competent authority, which register must contain the names, contact details and addresses of –
    (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; and
    (c) All organs of state which have jurisdiction in respect of the activity to which the application relates.

I&APs have been identified through a process of networking and referrals, obtaining information from Savannah Environmental's existing stakeholder database, liaison with potentially affected parties in the greater study area and a registration process involving the completion of a reply form. Key stakeholders and affected and surrounding landowners have been identified and registered on the project database. Other stakeholders are required to formally register their interest in the project. An initial list of key stakeholders identified and registered is listed in **Table 3.3**.

Table 3.3: List of Stakeholders identified for the inclusion in the project database during the public participation process for Decommissioning of Kriel Power Station's Asbestos Landfill Site

Organs of State
National Government Departments
Department of Environmental Affairs (DEA)
Department of Environmental Affairs (DEA): Biodiversity Conservation Directorate
Department of Agriculture and Fisheries (DAFF)
Department of Water and Sanitation (DWS)
Department of Rural Development and Land Reform
Department of Energy
Government Bodies and State-Owned Companies
National Energy Regulator of South Africa (NERSA)
South African Heritage Resources Agency (SAHRA)
Provincial Government Departments
Mpumalanga, Department of Agriculture, Land Reform and Rural Development
Mpumalanga, Department of Water and Sanitation (DWS)
Mpumalanga, Department of Energy
Mpumalanga Provincial Heritage Authority (MPHRA)
Local Government Departments
Nkangala District Municipality
eMalahleni Local Municipality
Landowners and neighbours
Eskom Holdings SOC Limited (as landowner)
Neighbouring Landowners (as neighbours)

As per Regulation 42 of the EIA Regulations, 2014 (as amended), all relevant stakeholder and I&AP information has been recorded within a register of I&APs (refer to **Appendix C1** for a listing of the recorded parties). In addition to the above-mentioned EIA Regulations, point 4.1 of the Public Participation Guidelines has also been followed. The register of I&APs contains the names, contact details and addresses of:

- all persons who requested to be registered on the database in writing and disclosed their interest in the project;
- all Organs of State which hold jurisdiction in respect of the activity to which the application relates;
- all persons identified and approached through networking or a chain referral system to identify any other stakeholder (i.e. ratepayers associations); and
- all persons who submitted written comments or attended meetings during the public participation process.

I&APs have been encouraged to register their interest in the BA process from the onset of the project, and the identification and registration of I&APs will be on-going for the duration of the BA process. The database of I&APs will be updated throughout the BA process and will act as a record of the I&APs involved in the public participation process.

ii. Advertisements and Notifications

40.(2)(a)	Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of – (i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and (ii) Any alternative site.
40.(2)(b)	Giving written notice, in any of the manners provided for in section 47D[1] of the Act, to – (i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area; (iv) The municipality which has jurisdiction in the area; (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and (vi) Any other party as required by the competent authority.
40.(2)(c)	Placing an advertisement in –

[1] Section 47D of NEMA pertains to the delivery of documents, and states that:

(1) A notice or other document in terms of this Act or a specific environmental management Act may be issued to a person –
(a) By delivering it by hand;
(b) By sending it by registered mail –
(i) To that person's business or residential address; or
(ii In the case of a juristic person, to its registered address or principal place of business;
(bA) By faxing a copy of the notice or other document to the person, if the person has a fax number;
(bB) By e-mailing a copy of the notice or other document to the person, if the person has an e-mail address; or
(bC) By posting a copy of the notice or other document to the person by ordinary mail, if the person has a postal address;
(c) Where an address is unknown despite reasonable enquiry, by publishing it once in the Gazette and once in a local newspaper circulating in the area of that person's last known residential or business address.

(2) A notice or other document issued in terms of subsection (1)(b), (bA), (bB), (bC) or (c) must be regarded as having come to the notice of the person, unless the contrary is proved."

	(i) One local newspaper; or (ii) Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
40.(2)(d)	Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and
40.(2)(e)	Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to – (i) Illiteracy; (ii) Disability; or (iii) Any other disadvantage.

The BA process was announced with an invitation to the Organs of State, potentially affected and neighbouring landowners and general public to register as I&APs and to actively participate in the process. This was achieved via the following:

- Placement of site notices announcing the BA process at visible points along the boundary of the project site, in accordance with the requirements of the EIA Regulations. Photographs and the GPS co-ordinates of the site notices are included in **Appendix C2**.
- BA process notification letters announcing the BA process, notifying Organs of State, potentially affected and neighbouring landowners, as well as registered stakeholders/I&APs of the vegetable oil pipeline, providing background information of the project and inviting I&APs to register on the project's database, were distributed via email on 25 June 2019. The proof of the distribution of the process notification letters are included in **Appendix C** of the Final BA Report.
- Placement of advertisement announcing the BA process and the availability of and inviting comment on the BA Report in the Witbank News newspaper on **19 July 2019**. The tearsheet (proof) of the newspaper advert placement is included in **Appendix C2**.
- The BA Report for review was made available for review by I&APs for a 30-day review period from **Friday, 19 July 2019** to **Monday, 19 August 2019**. CD and hard copy versions of the BA Report were circulated to Organs of State via courier at the commencement of the review period. Proof the BA Report distribution to the Organs of State is included in **Appendix C4**. The BA Report was also made available on the Savannah Environmental website. The evidence of distribution of the BA Report is included in **Appendix C4**.

iii. Public Involvement and Consultation

In order to accommodate the varying needs of stakeholders and I&APs within the greater study area, as well as capture their views, comments, issues and concerns regarding the project, various opportunities have been and will continue to be provided to I&APs to note their comments and issues. I&APs were being consulted through the following means:

Table 3.4: Public involvement for the Decommissioning of Kriel Power Station's Asbestos Landfill Site

Activity	Date
Distribution of the process notification and stakeholder reply form announcing the BA process and inviting I&APs to register on the project database.	25 June 2019
Placement of site notices on-site and in public places.	29 March 2019
Distribution of notification letters announcing the availability of the BA Report for review for a 30-day public review and comment period. These letters were distributed to Organs of State, Government Departments, Ward Councillors, landowners within the greater study area (including neighbouring landowners) and key stakeholder groups.	17 July 2019
Advertising of the availability of the BA Report for a 30-day review period in the Witbank News newspaper.	19 July 2019
30-day review period for the BA Report for comment.	19 July 2019 – 19 August 2019
Focus Group Meetings (where applicable): » Local Municipality	2 August 2019
On-going consultation (i.e. telephone liaison; e-mail communication) with registered I&APs	Throughout BA Report 30-day review period.

The purpose of the abovementioned meetings was to engage with key stakeholders to ensure that key requirements/comments are noted and addressed as part of the BA process. Records of all consultation undertaken is included in **Appendix C**.

iv. Registered I&APs entitled to comment on the BA Report and Plans

43.(1) A registered I&AP is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

(2) In order to give effect to section 24O of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7(2), to comment within 30 days.

44.(1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.

(2) Where a person desires but is unable to access written comments as contemplated in sub regulation (1) due to –

(a) A lack of skills to read or write;
(b) Disability; or
(c) Any other disadvantage;

Reasonable alternative methods of recording comments must be provided for.

I&APs registered on the database were notified by means of a notification letter (email and registered mail) of the release of the BA Report for a 30-day public review period, and were invited to provide comments on the BA Report, and informed of the manner in which, and timeframe within which such comments must be made. The notifications were distributed prior to the commencement of the 30-day public review period on, **Wednesday, 17 July 2019.**

v. Identification and Recording of Comments

Comments raised by I&APs over the duration of the BA process are synthesised into a Comments and Responses (C&R) Report which is be included in **Appendix C7**. The C&R Report includes detailed and all written comments received (captured verbatim and not summarised) and responses provided by the EIA project team and/or the project applicant to the issues and comments raised during the public participation process.

Meeting notes of the Focus Group Meeting held on **Friday, 2 August 2019**, with the eMalahleni Local Municipality during the 30-day public review period of the BA Report are included in **Appendix C6** of this Final BA Report.

3.3.3 Assessment of Issues Identified through the BA Process

Key issues emanating from the Public Participation Process are summarised below:

Summary of main issues raised by I&APs & Organs of State	Summary of response from EAP
Thank you for informing SAHRA of the proposed Environmental Authorisation application. However, SAHRA does not accept physical and emailed notifications for commenting on proposed developments. We work on a digital platform named SAHRIS (http://www.sahra.org.za/sahris), where you will need to create a case and upload all the documents compiled for the development application. If a case has been created on SAHRIS please email back with the case ID number.	The request was acknowledged, and it was confirmed that once the BAR has been uploaded and a Case ID issued, the Heritage Officer will be notified, as requested, accordingly. The BAR will be uploaded on SAHRIS on Friday, 19 July 2019 and proof of upload will be included in the final BAR.

3.4 Assumptions and Limitations of the BA Process

The following assumptions and limitations are applicable to this BA process:

- All information provided by the applicant and I&APs to the project team was correct and valid at the time it was provided.
- It is assumed that the asbestos landfill site is buried and completely encapsulated by ash within Ash Dam 1 at the Kriel Power Station.
- This BA Report and its investigations are site-specific, and consequently the project team did not evaluate any other sites to be decommissioned.

CHAPTER 4: DESCRIPTION OF THE RECEIVING ENVIRONMENT

This Chapter provides a description of the environment that surrounds the Kriel Power Station and in particular the asbestos landfill site. The information is provided in order to assist the reader in understanding the receiving environment within which the asbestos landfill site is located, and features of the biophysical and social environment that could be directly or indirectly affected by, or alternatively could impact on, the decommissioning of the landfill site. This information has been sourced from existing available information as part of the BA process and aims to provide the context within which this BA is being conducted.

4.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of the EIA Regulations, 2014 - Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
3(h)(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	The environmental attributes associated with the asbestos landfill site and the broader environment are described and considered within this chapter and include the following: » The regional setting within which Kriel Power Station is located is described in **section 4.2**. » The climatic conditions of the area within which Kriel Power Station is located is discussed in **section 4.4**. » The biophysical characteristics of the station and the surrounding areas are described in **sections 4.5 – 4.7**. This includes the topography and terrain, geology, and the vegetation of the Kriel Power Station. » The heritage of the affected environment (including the archaeology, palaeontology and cultural landscape) is discussed in **sections 4.8 – 4.9**. » The social context within which the Kriel Power Station is located is described in **section 4.10**.

4.2 Regional Setting: Location of the Asbestos Landfill Site

The asbestos landfill site (at the Kriel Power Station) is located approximately 8km west of Kriel in the Mpumalanga Province, ~4km north-east of Matla Power Station and 60km south of eMalahleni. The Mpumalanga Province is South Africa's 8th largest province and the Province covers an area of approximately 76 49km^2 in extent, which is equivalent to ~6.5% of South Arica's total land area. The Province accommodates 4 039 939 million residents and is the 6th most populous province in the country. The province shares its borders with countries, Mozambique and Swaziland.

The asbestos landfill site is are located within the eMalahleni Local Municipality which is one of the six (6) municipalities within the greater Nkangala District Municipality (NDM). The NDM is situated within the western section of the Mpumalanga Province and is home to twelve (12) Eskom coal-fired power stations.

The N4 national route links the province with Mozambique whereas, the other national routes in the Province; N11 and N12 link Mpumalanga with the Gauteng, Limpopo, North West and the KwaZulu-Natal provinces. The asbestos landfill site is located ~ 1.76km south of the units of the KPS, ~4.63km east of the units of the Matla Power Station and 2.4km north of Ash Dam 2 within the footprint of the Kriel Power Station. Furthermore, the landfill site is located on the northern boundary of the Ash Dam 1, with a total extent of approximately 2.3ha.

4.3 Existing Land-Use

The land use of the area on which the asbestos landfill site is located has been zoned for agriculture. The asbestos landfill site is located adjacent to the Kriel Colliery, which currently supplies both the Kriel and Matla power stations with coal. Kriel as a town, with Thubelihle as its township ate located 8km west and 11km north-east of the Kriel Power Station. In addition, the Exxaro Matla three (3) underground coal mines are located to the east of Kriel whilst their main operational infrastructure is located 6km east of the power station.

A 1km airfield is located 1km east of the asbestos landfill site whereas the Rietstroom Park and Lehlaka Park residential areas are located 9km to the north of the asbestos landfill site. In addition, Kriel Power Station covers an area of 700ha and the area within its surrounds is occupied by mine dumps, coal open cast mines and wastewater infrastructure.

4.4 Climatic Conditions

The asbestos landfill site is located within the Highveld climate zone. This zone is characterised by summer rainfall with thunderstorms from October to March. The zone on average receives 601-700mm per annum of rainfall. The average temperatures are moderate (average of 24°C) with cold and frosty winter months. Prevailing northerly and easterly winds are dominant during summer months, while easterly winds occur in autumn and westerly winds during winter.

4.5 Topography & Hydrology

The area is approximately 1600m above sea level on the Highveld plateau and is characterised by an undulating landscape with slopes less than 1:30. In addition, the station falls within the Olifants Catchment Area, with the Klein-Olifants, Olifants, Wilge, Rietspruit, Steenkoolspruit and Brugspruit being the main rivers in the area. Major dams include the Rietspruit, Doringpoort and Witbank Dams (eMalahleni Local Municipality, 2009). Natural springs in the vicinity of the station feed the seasonal Onverwacht, Pampoen, and Vaal Pan Spruits.

The springs drain to the east, north and west respectively. Furthermore, all surface water within the area drains in the Olifants River via the Riet and Steenkool Spruits. Therefore, the Rietspruit flows to the north of the station into the Rietspruit Dam from where the water enters the Steenkoolspruit, which is located to the

southeast of the station. Both rivers are located within the B11E and B11D quaternary catchments and are perennial. Furthermore, both rivers have a Present Ecological Status (PES) of Class D: Largely Modified.

Therefore, these rivers are Critically Endangered due to the ecosystem processes they maintain downstream.

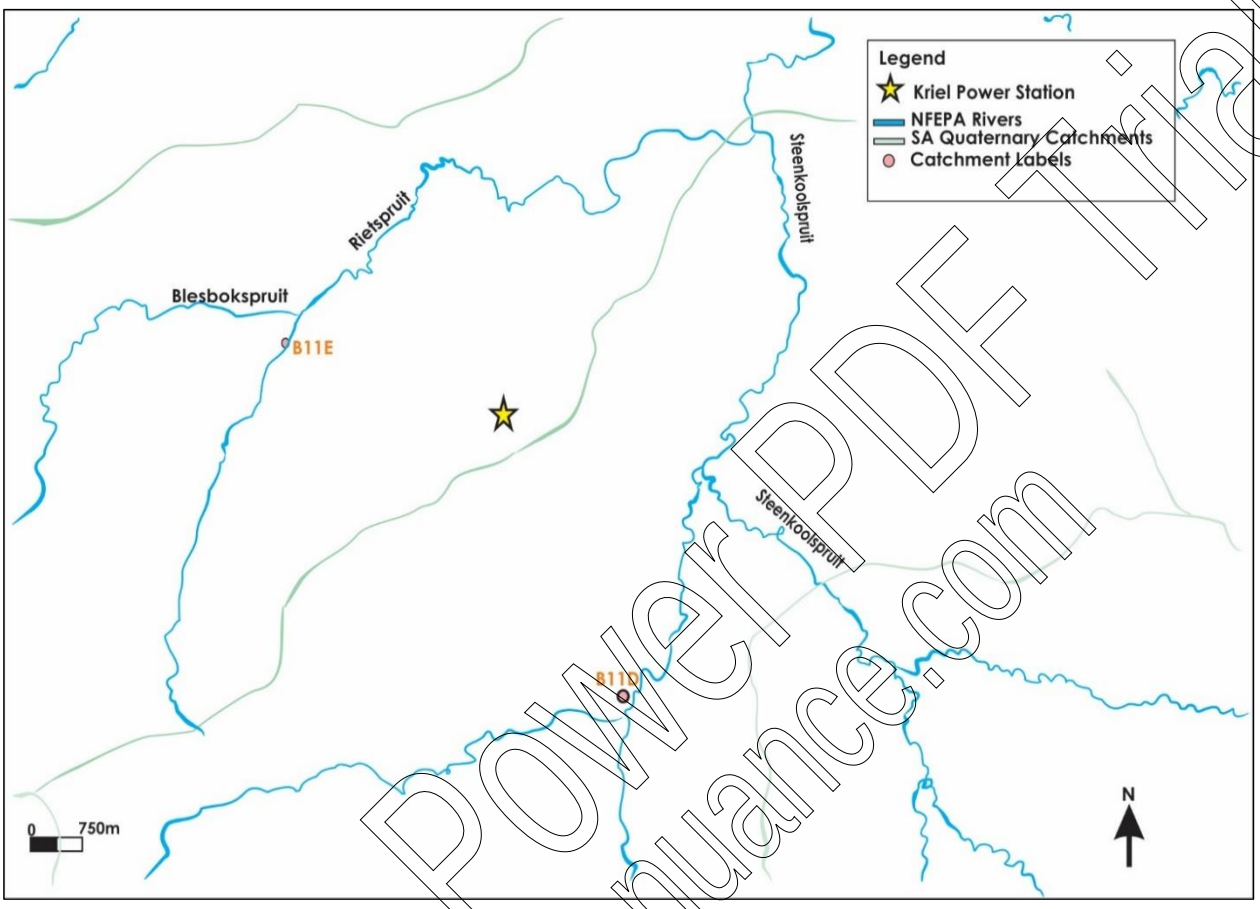

Figure 4.1: Tributaries within the quaternary catchments in and around Kriel (adapted from Aurecon, 2017)

4.6 Geology

The asbestos landfill site is located within the Karoo Basin that contains sediments deposited in fluvial floodplains and a shallow continental shelf over a period extending from the late Carboniferous Period (~290 million years ago) to the early Jurassic Period (~190 million years ago), before the separation of southern Africa and Gondwanaland. These sediments were deposited in fluvio-deltaic environments where swamps and marshes existed, and peat accumulated. Therefore, interlayered shales, mudstones, siltstones and sandstones constitute the bulk of the rock strata found in the area. Furthermore, dolerites, a prominent geological feature of the Karoo Basin, intruded after sedimentation in the basin had nearly ceased due to the intrusion of the Drakensburg basalts. These intrusive rocks intruded older successions of the Karoo Basin along planes of weaknesses. Therefore, in the vicinity of Kriel, few dolerite intrusions are present which form sub-vertical dykes (J &W,2010).

Small fracture zones normally associated with the upper and lower contacts of sills (usually aquifers) also occur throughout the area of the station (Aurecon, 2010). The Karoo Basin has been subjected to several cycles of erosion, which resulted in weathering to great depths. Therefore, rocky outcrops are rare in this

area and are often covered by transported soils. Weathering in the area is largely dependent on climatic conditions with disintegration occurring in the dry regions and decomposition in the wet regions (J&W, 2010).

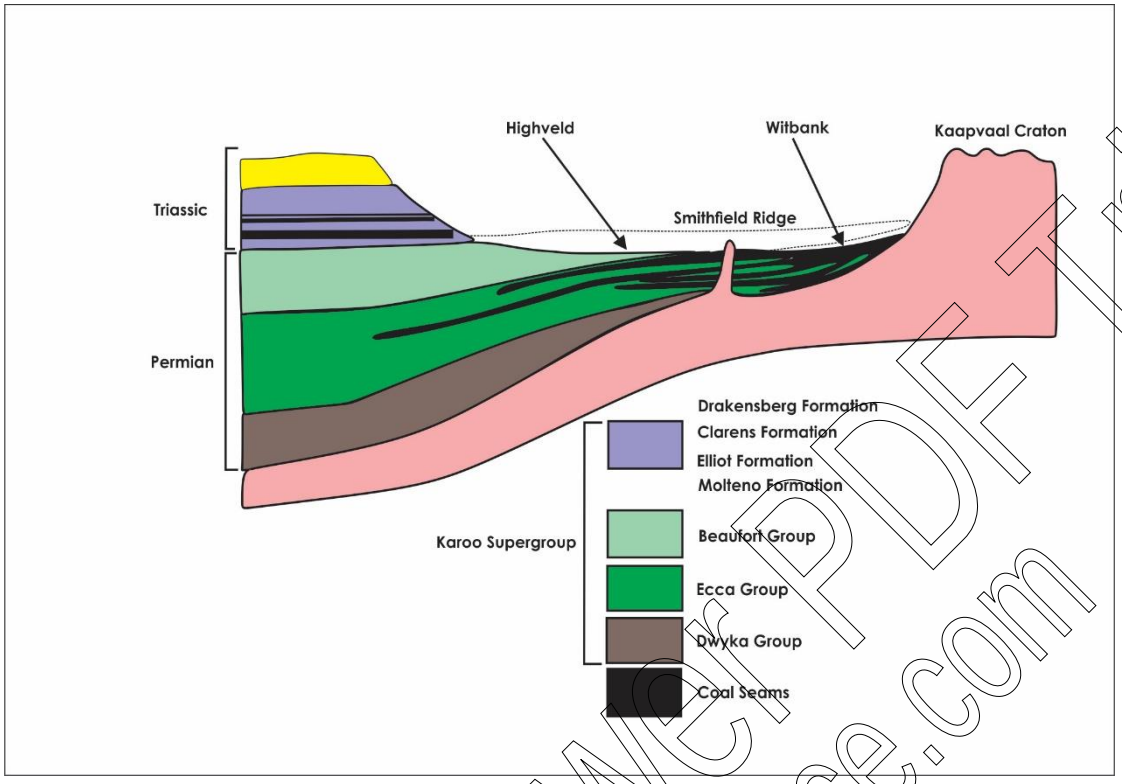

Figure 4.2: Schematic diagram illustrating the Witbank and Highveld coalfields separated by the Smithfield Ridge (adapted from Hancox, 2014).

4.7 Vegetation

The asbestos landfill site is located within the Mesic Highveld Grassland (MHG) Bioregion as defined by Mucina and Rutherford (2006). Within the vicinity of the station, the dominant vegetation type found is the Eastern Highveld Grassland. Typically, this vegetation type occurs at a general altitude of 1 520 -1 780m, as well as 1 300m within the Mpumalanga and Gauteng Provinces. However, within the vicinity of Ash Dam 1, the grass species described above are minimal to non-existent as the footprint of the station is generally heavily modified.

4.8 Heritage Resources

The footprint of the broader Kriel power station is heavily modified due to the development of infrastructure that has taken place since its commissioning in the 1970s. In addition, the due to the asbestos site being located within the existing ash dam, no heritage resources are contained therein and so no heritage impact is expected from the decommissioning of the asbestos landfill site. From a heritage perspective, the footprint asbestos landfill site contains no historic, Iron and Stone Age heritage resources.

The decommissioning of the asbestos landfill site at Ash Dam 1 will not include any construction-related activities, therefore, no exposure of heritage resources is anticipated to be associated with the decommissioning of the landfill site.

4.9 Palaeontology

The footprint of the station and associated infrastructure (i.e. Ash Dam Complex) is underlain by rocks of the Vryheid Formation which are predominantly made up of coarse sandstones, conglomerates and coal seams. The depositional setting of the sediments that formed this suite of sedimentary rocks was possibly a sandy shoreline that stretched out to massive swamplands. In the swamps, there was an accumulation of organic material (i.e. plant debris) which under anaerobic conditions formed coal.

In the view of the above, Ash Dam 1 wholly consists of solidified ash, with wet ash (assuming it is still in liquid form) lying atop this feature at the Kriel Power Station. The asbestos landfill site is buried within Ash Dam 1 and completely encapsulated with solidified ash. The decommissioning of the asbestos landfill site will not require any excavations or activities that might have an impact on the underlying geological strata. Therefore, it is on this basis that the decommissioning of the asbestos landfill site within Ash Dam 1 at the Kriel Power Station will not have any detrimental impacts on palaeontological resources.

4.10 Social and Economic Characteristics of the Kriel Power Station

The decommissioning of the asbestos landfill site within the station will not be of any significance to sensitive social receptors within the surrounding area. Nevertheless, it remains important to consider the baseline social environment of the area surrounding the station in the following sub-headings.

4.10.1 Demographics

The asbestos landfill site is located within the eMalahleni Local Municipality (ELM) which is one of the six (6) local municipalities within the greater Nkangala District Municipality (NDM). The ELM has an extent of ~ 2 678m^2 whilst the NDM is 16 892m^2 in extent. The two (2) municipalities have a population of 395 466 and 1 226 500 respectively. In addition, the NDM has the highest population density (35%) amongst the three (3) DMs in the Mpumalanga Province.

The ELM is distinguished from other LMs within the Province by a strong economically active population, representing more than half of the total population of the NDM. The local municipality has experienced population growth of ~3.6% between 2001 and 2011, which is higher than the national growth rate of 1.86% (Census, 2011). The dominant population groups within the ELM are, the black African population (81%), White (16%), Coloured and Indian (each covering less than 2%). The population age distribution reveals a young and economically active population (15 - 64) at 71%.

4.10.2 Education

Levels of education, like health are a good and reliable indication of the economic status and quality of life within an area. Data from the ELM regarding education has shown that, only 5.8% of its population that is above the age of 20 years, has not received any formal schooling. However, 38,4% of the municipality's residents have received primary education, whilst 5.9% completing this phase and another 32.7% receiving secondary education. Furthermore, only 2.5% of those that received secondary education completed matric (or passed Grade 12).

The eMalahleni Local Municipality Spatial Development Framework, 2015 refers to four (4) institutions of higher learning being located within the jurisdiction of the ELM. In order to reduce the high unemployment

rate of the youth in the ELM, and increase literacy levels, the improvement of institutions of learning should be prioritised.

CHAPTER 5: ASSESSMENT OF IMPACTS AND CUMULATIVE IMPACTS

This Chapter serves to assess the significance of the positive and negative environmental impacts (direct, indirect and cumulative) expected to be associated with the Decommissioning of Kriel Power Station's Asbestos Landfill Site.

This assessment has considered the decommissioning of the asbestos landfill site within the power station which is approximately 2.3ha in extent. The decommissioning of this facility will not include any infrastructure as the facility is encapsulated within Ash Dam 1 at the Kriel Power Station.

5.1 Decommissioning Activities

No construction-related activities will be associated with the decommissioning of the Asbestos Landfill Site. If any activities are to take place, this will only pertain to the insertion of notices indicating that the site contains hazardous waste, which in this case being asbestos. No further activities are envisaged. The current operations associated with the disposal of ash slurry/sludge at Ash Dam 1 will continue as usual in line with the relevant monitoring plans for the operation of the ash dam.

5.2 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of the BA Report:

Requirement	Relevant Section
3(h)(v) the impacts and risks identified 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.	The impacts and risk associated with the decommissioning of the Asbestos Landfill Site including the nature, significance, consequence, extent, duration and probability of the impacts and the degree to which the impacts can be reversed and cause an irreplaceable loss of resources are included in **section 5.4**.
3(h)(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	The positive and negative impacts associated with the decommissioning of the Asbestos Landfill Site are included in **sections 5.4.1** and **5.4.2.**
3(h)(viii) the possible mitigation measures that could be applied and the level of residual risk.	The mitigation measures that can be applied to the impacts associated with the decommissioning of the Asbestos Landfill Site are included in **section 5.4.2.**
3(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 (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	A description of all environmental impacts identified for the decommissioning of the Asbestos Landfill Site and the extent to which the impact significance can be reduced through the implementation of the recommended mitigation measures provided in the BA Report are included in **section 5.4.2**.

Requirement	Relevant Section
extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures,.	
3(j) an assessment of each identified potentially significant impact and risk, including (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.	An assessment of each impact associated with the development of the decommissioning of the Asbestos Landfill Site including the nature and significance, the extent and duration, the probability, the reversibility, and the potential loss of irreplaceable resources, as well as the degree to which the significance of the impacts can be mitigated are included in **section 5.4.2.**
3(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr.	Mitigation measures recommended by the EAP for the reduction of the impact significance are included in **section 5.4.2.**

Potential impacts associated with the decommissioning of the asbestos landfill site are discussed below. It is noteworthy that the site and the surrounding area is completely transformed, and no construction-related activities will be undertaken during the decommissioning of the asbestos landfill site. Therefore, no specialist assessments were required or undertaken in this BA process.

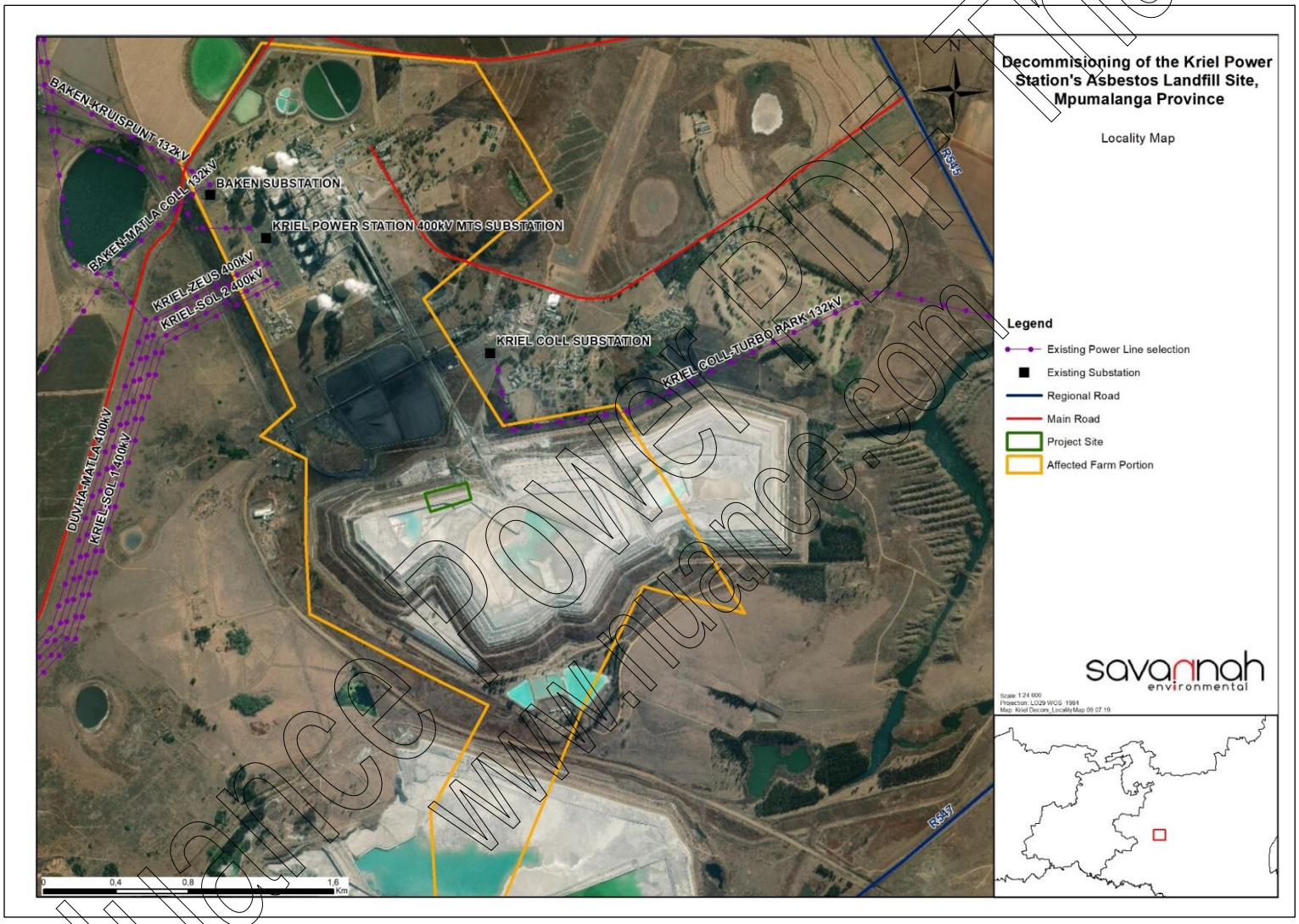

Figure 5.1: Map showing the location of the asbestos landfill site within Ash Dam 1 at the Kriel Power Station as assessed as part of this BA process (refer to **Appendix F** for A3 maps)

5.3 Impact Assessment Methodology

The asbestos waste within the landfill is completely buried/encapsulated by solidified ash within Ash Dam 1. In addition, the footprint of the station is extensively transformed due to infrastructure development-related projects that have taken place since its commissioning in the 1970s. Furthermore, no construction-related activities will be associated with the decommissioning of the Asbestos Landfill Site. If any activities are to take place, this will only pertain to the placement of notices to illustrate to workers in the area of the presence of asbestos waste. Therefore, it is on this basis that only generic environmental impacts that are associated with the decommissioning of the asbestos landfill site and no independent environmental specialist studies were required.

The following methodology was used in assessing the generic impacts related to the decommissioning of the asbestos landfill site. All impacts are assessed according to the following criteria:

- The **nature**, a description of what causes the effect, what will be affected, and how it will be affected.
- The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high).
- The **duration**, wherein it is indicated whether:
  - The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - Medium-term (5–15 years) – assigned a score of 3;
  - Long term (> 15 years) - assigned a score of 4; or;
  - Permanent - assigned a score of 5.
- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - 0 is small and will have no effect on the environment;
  - 2 is minor and will not result in an impact on processes;
  - 4 is low and will cause a slight impact on processes;
  - 6 is moderate and will result in processes continuing but in a modified way;
  - 8 is high (processes are altered to the extent that they temporarily cease); and
  - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
  - Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
  - Assigned a score of 2 is improbable (some possibility, but low likelihood);
  - Assigned a score of 3 is probable (distinct possibility);
  - Assigned a score of 4 is highly probable (most likely); and
  - Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- The **status**, which is described as positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

S= (E+D+M) P; where
S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

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

» **< 30 points:** Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
» **30-60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
» **> 60 points**: High (i.e. where the impact must have an influence on the decision process to develop in the area).

5.4 Decommissioning Phase Impacts

Below are summarised environmental impacts anticipated to be associated with the decommissioning of the asbestos landfill site:

» The landfill is completely encapsulated/buried within solid ash that makes up Ash Dam 1 at the station;
» The site is not operational and no asbestos has been disposed of within the site since June 2008; and
» The decommissioning of the Asbestos Landfill Site will not be associated with any construction-related activities. If any activities associated with the decommissioning are to take place, these will solely pertain to the placement of notice boards around the perimeter of the site and at the entrance to raise awareness within workers and contractors in the area of the presence of asbestos waste. In addition, this notice would also prohibit access of unauthorised persons to the area. Therefore, these impacts are anticipated to be of a low significance.

5.4.1 Description of Groundwater and Surface Water Impacts

The following potential impacts have been identified and are considered relevant to the decommissioning of the asbestos landfill site at the Kriel Power Station:

Groundwater Quality

Currently Ash Dam 1 is not lined. Taking into consideration that the landfill site is completely buried within Ash Dam 1 and underlain by a 6m thick ash layer which has solidified over the past 27 years, there is a very minimal chance of seepage of water through the ash layers and interactions with the asbestos waste could result in the contamination of groundwater at greater depths. Furthermore, the development of cracks/fissures on the outside walls of the ash dam could potentially lead to an ingress of water into the landfill site further increasing seepage and adversely affecting groundwater quality.

Surface Water Impacts and Soil Contamination

Possible surface water deterioration as a result of infiltration or erosion of run-off flows over or around Ash Dam 1. However, the continuous deposition of ash at Ash Dam 1 will further encapsulate the asbestos waste so that it cannot be accessed, eroded or exposed. Potential liberation of asbestos fibres to the surface and groundwater will therefore be minimised.

Asbestos fibre particles may contaminate nearby soils should the site be exposed to excavations or seepage of asbestos fibres through groundwater pathways. Although this impact should be taken into consideration, it is also noteworthy that the cementing character of the ash has resulted in the permeability and settlement of surrounding ash being of a very low magnitude with minimal effects on the underlying bedrock. Furthermore, Ash Dam 1 has been constructed on a sandstone and shale predominant lithology which is also overlain by a 3 – 4m thick clay layer which contains significant attenuation properties which further inhibit any seepage migration into the groundwater system.

5.4.2 Impact tables summarising the significance of groundwater, surface water and soil contamination impacts during the decommissioning of the asbestos landfill site at the Kriel Power Station (with and without mitigation)

Nature: *Groundwater Quality*

Taking into consideration that the landfill site is completely buried within Ash Dam 1 which is not currently lined, there is possible seepage of water through the ash layers which could result in the contamination of groundwater at greater depths. The development of cracks/fissures on the dried sections of the Ash Dam could lead to an ingress of water into the Asbestos Landfill Site further increasing seepage and adversely affecting groundwater quality. However, the continuous deposition of ash at Ash Dam 1 will further encapsulate the Asbestos Landfill Site so that access, erosion and re-exposure is limited throughout the lifespan of Ash Dam 1. Existing waste treatment practices currently being employed for Ash Dam 1 are also applicable to the asbestos site due to the asbestos site being contained within the existing Ash Dam 1.

	Without mitigation	**With mitigation**
Extent	Local (2)	Local (2)
Duration	Short-term (2)	Short-term (1)
Magnitude	Low (4)	Low (2)
Probability	Improbable (2)	Very Improbable (1)
Significance	**Low (12)**	**Low (5)**
Status (positive or negative)	Negative	
Reversibility	Moderate	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- Ash must not be reclaimed from this portion of Ash Dam 1, with clear signage issued to indicate no reclamation allowed. The relevant staff members at Eskom should be informed of the exact location of the Asbestos Landfill Site and must be informed that all reclamation, earthworks and vehicle or equipment movements within the Asbestos Landfill Site footprint is not allowed, in order to avoid potential inadvertent exposure of the site should future work be conducted pertaining the ash dam.
- Conduct visual inspections on Ash Dam 1 annually to inspect cracks or fissures on the slopes, or any potential breach/exposure of the asbestos waste material.
- Should any potential exposure be found, these areas must be closed and filled with suitable material as soon as possible after detection.

» Undertake groundwater monitoring (on annual basis) for asbestos fibres for 10-years after the decommissioning of the Asbestos Landfill Site in accordance with the provisions of the Monitoring Programme of Kriel Power Station.

Cumulative Impacts:

The area surrounding the Kriel Power Station has been significantly transformed and fragmented due to anthropogenic disturbance. In addition, no similar facility is currently known to be operating within the area and therefore, no significant cumulative impacts are anticipated.

Residual Impacts:

None expected should mitigation measures be correctly implemented.

Nature: *Surface Water Quality and Soil Contamination*

Possible surface water deterioration as a result of infiltration or erosion of surface water run-off flows over/ or around Ash Dam 1. However, the continuous deposition of ash at Ash Dam 1 will further encapsulate the asbestos waste so that it cannot be accessed, eroded or exposed. Potential liberation of asbestos fibres to the surface and groundwater will therefore be minimised.

There is also the likelihood of asbestos fibres contaminating nearby soils should the site be exposed to excavations or seepage of these fibres through existing groundwater pathways. It is also noteworthy that the cementing character of the ash has resulted in the permeability and settlement of surrounding ash being of a very low magnitude with minimal effects on the underlying bedrock.

	Without mitigation	**With mitigation**
Extent	Local (2)	Local (2)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (4)	Low (2)
Probability	Improbable (2)	Improbable (2)
Significance	**Low (12)**	**Low (8)**
Status (positive or negative)	Negative	
Reversibility	Moderate	
Irreplaceable loss of resources?	Yes	
Can impacts be mitigated?	Yes	

Mitigation:

» Ash must not be reclaimed from this portion of the ash dam, with clear signage issued to indicate no reclamation is allowed. The relevant staff members at Eskom and Kriel Power Station should be informed of the exact location of the Asbestos Landfill Site and be informed that all reclamation, earthworks and vehicle or equipment movements within the landfill site footprint is not allowed, in order to avoid potential inadvertent exposure of the site should future work be conducted pertaining the ash dam.

» The operations at Ash Dam 1 should continue in line with the implemented operations manual and in accordance with the provisions of the Waste Management Licence issued by the DEA.

» Furthermore, the co-ordinates of the Asbestos Landfill Site should remain on record, with appropriate signage erected at the current Ash Dam 1 to indicate the presence of the landfill site, the health implications and the necessary safety measures that need to be taken.

» Ensure a suitable stormwater management system is maintained for the ash dam facility, as per current Kriel management practices, to reduce the potential for runoff where the asbestos facility occurs.

» Conduct surface water monitoring for asbestos fibres annually (for a 10-year period) following the decommissioning of the Asbestos Landfill Site in accordance with the provisions of the Kriel Power Station Monitoring Programme to identify any sudden increase or unacceptable levels of asbestos compounds in any of the surface water features.

Cumulative Impacts

The area surrounding the Kriel Power Station has been significantly transformed and fragmented due to anthropogenic disturbance. In addition, no similar facility is currently known to be operating within the area and therefore, no significant cumulative impacts are anticipated.

Residual Impacts
Expected to be low if mitigation measures are correctly implemented.

5.4.3 Implications for Project Implementation

With the implementation of mitigation measures by Kriel Power Station's operational staff and service providers (i.e. the company conducting groundwater monitoring at the station), the significance of the impacts envisaged due to the decommissioning of the Asbestos Landfill Site can be reduced to low. From the outcomes of this BA process, it is concluded that the decommissioning of the Asbestos Landfill Site within Ash Dam 1 at Kriel Power Station is environmentally acceptable. On-site mitigation is viewed the most practical and appropriate action, and viable options for reducing the overall impact is detailed below:

- Adhere to the prescriptions of the waste management license, environmental authorisation issued and the environmental management programme (EMPr) for the operation of Ash Dam 1 at the Kriel Power Station.
- Continued operation and maintenance of the existing groundwater monitoring programme currently employed by the Kriel Power Station, in order to identify any unacceptable levels of asbestos in ground and surface water features near the ash dam;
- Continued operation and maintenance of the existing stormwater systems and practices currently being employed by the Kriel Power Station, in order to reduce the potential for erosion and exposure of the asbestos facility and thus incur soil and water contamination; and
- Implementation of all the abovementioned mitigation measures contained in this Report.

5.5 Assessment of the 'Do Nothing' Alternative

The **'Do-Nothing'** alternative *(i.e.* no-go alternative) is the option of not decommissioning the asbestos Landfill Site within Ash Dam 1 at the Kriel Power Station. Should this be the case, the applicant, Eskom SOC Holdings Limited will continue to be liable to adhering to existing permit conditions issued by the then Department of Water and Forestry (DWAF). This would also mean the impacts outlined above in section 5.4.2 could possibly occur without the implementation of the recommended mitigation measures.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

Eskom Holdings SOC Ltd and Kriel Power Station are proposing the decommissioning of the Asbestos Landfill Site at the Kriel Power Station in the Mpumalanga Province. The Asbestos Landfill Site was used for the disposal of asbestos waste generated from the power generation process at the station. The Asbestos Landfill Site was authorised in accordance with section 20 of the Environmental Conservation Act (Act No. 73 of 1989) in February 1992. The Asbestos Landfill Site has become an operational liability to the station in terms of compliance to certain conditions included in the permit issued by the then Department of Water and Forestry (DWAF) in 1992. It is for this reason that the decommissioning of the Asbestos Landfill Site is sought through this application from the competent authority for a waste management licence.

A summary of the recommendations and conclusions for the decommissioning of the Asbestos Landfill Site at the Kriel Power Station as determined through the BA process is provided in this Chapter.

6.1. Legal Requirements as per the EIA Regulations, 2014 (as amended)

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of the BA Report:

Requirement	Relevant Section
3(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	A summary of the findings of the BA process are included in **section 6.2.**
3(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 (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	An environmental impact statement containing the key findings of the environmental impacts identified for the decommissioning of the asbestos landfill site are included in **section 6.6**. An environmental sensitivity map showing the locality of the asbestos landfill in relation to sensitive environmental receptors has been included as **Figure 6.1**. In addition, a summary of the positive and negative impacts associated with the decommissioning of the asbestos landfill site are included **section 6.5.**
3(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.	All conditions required to be included in the waste management licence are included in **section 6.7**.
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.	A reasoned opinion as to whether the decommissioning of the asbestos landfill site should be authorised is included in **section 6.6**

6.2. Evaluation of the Decommissioning of the Asbestos Landfill Site

The preceding chapters of this BA Report provide a detailed assessment of the potential impacts that may result from the decommissioning of the Asbestos Landfill Site within Ash Dam 1 at the Kriel Power Station. This chapter concluded the environmental assessment of the decommissioning of the asbestos landfill site at the

Kriel Power Station by providing a summary of the results and conclusions of the assessment. In doing so, it draws on the information gathered as part of the BA process, the knowledge gained by the environmental assessment practitioner (EAP) and presents a combined and informed opinion of the environmental impacts associated with the decommissioning of the landfill site.

No environmental fatal flaws are associated with the decommissioning of the asbestos landfill site at the Kriel Power Station, and no impacts of an unacceptable significance are expected to occur following the implementation of the recommended mitigation measures. This measure includes, amongst others, the placement of signage at conspicuous locations around the ash dam to indicate that reclamation of asbestos at the site is prohibited.

The potential environmental impacts associated with the decommissioning of the Asbestos Landfill Site identified and assessed through the BA process include:

» Impacts on groundwater quality.
» Impacts on surface water and soil contamination.

6.2.1 Impacts on Groundwater Quality

Taking into consideration that Ash Dam 1 is not lined, and the asbestos landfill site is completely buried within the ash dam and is underlain by a 6m thick ash layer which has solidified over the past 27 years, the seepage of water through the ash layers and interactions with the asbestos waste could result in minor contamination of groundwater at greater depths. Furthermore, the development of cracks/fissures on the outside walls of the ash dam could potentially lead to an ingress of water into the landfill site, potentially increasing seepage and adversely affecting groundwater quality.

The groundwater quality impacts associated with the decommissioning of the asbestos landfill site are associated with a low negative significance due to, the station already having a monitoring programme, being implemented in accordance with the current operations of the ash dam. Therefore, from this perspective, the decommissioning of the asbestos landfill site is acceptable from a groundwater quality perspective and will not result in any detrimental impacts, considering that no asbestos concerns were noted in the previous years' monitoring programme. Overall, this impact was deemed a low negative significance.

6.2.2 Impacts on Surface Water and Soil Contamination

Possible surface water deterioration may result due to infiltration or erosion by surface water run-off over or around Ash Dam 1. However, taking into consideration that the station continues to dispose of ash sludge/slurry at the ash dam, this will further encapsulate the asbestos landfill site due to the cementing character of the ash slurry, so that it cannot be accessed, eroded or exposed. Potential liberation of asbestos fibres to surface water will be greatly minimised.

Asbestos fibre particles may contaminate nearby soils should the site be exposed to excavations or seepage of asbestos fibres through groundwater pathways. Although this impact should be taken into consideration, it is also noteworthy that the cementing character of the ash slurry results in a dense layer of ash which creates a solid layer of ash overlying the asbestos waste and reduces any potential of asbestos fibre particles leachates. Furthermore, Ash Dam 1 has been constructed on a sandstone and shale dominant rock layer which is also overlain by a 3 – 4m thick clay layer, both of which contains significant attenuation properties.

This further inhibits any seepage or asbestos migration into the groundwater system. Overall, this impact was deemed to be of a low negative significance.

6.2.3 Assessment of Cumulative Impacts

Taking into consideration that the Asbestos Landfill Site is completely encapsulated within Ash Dam 1 and the probability of any exposure to the natural environment is minimal, and there are no known asbestos landfill sites located within a 30km radius from Kriel Power Station, the cumulative impact associated with the decommissioning of the landfill site is of a low significance. Furthermore, the landfill site is located within an area that is entirely transformed, therefore, no potential cumulative impacts are envisaged to be associated with the decommissioning of the asbestos landfill site and if any are to occur, these would be of a low significance taking into consideration the implementation of the recommended mitigation measures included in the preceding chapter of this BA Report.

6.3. Desktop Environmental Sensitivity of Asbestos Landfill Site

The development footprint associated with the ash dam and the landfill site is entirely transformed having been developed and operated as an ash dam, with the associated ash layering for many years. Furthermore, from an environmental perspective, this area contains no remnants of natural vegetation. Therefore, the environmental sensitivity associated with the footprint of the asbestos landfill site is low as shown in **Figure 6.1** below.

Figure 6.1 includes a sensitivity map illustrating the absence of any significant environmental sensitive receptors within the vicinity of the ash dam and the asbestos landfill site.

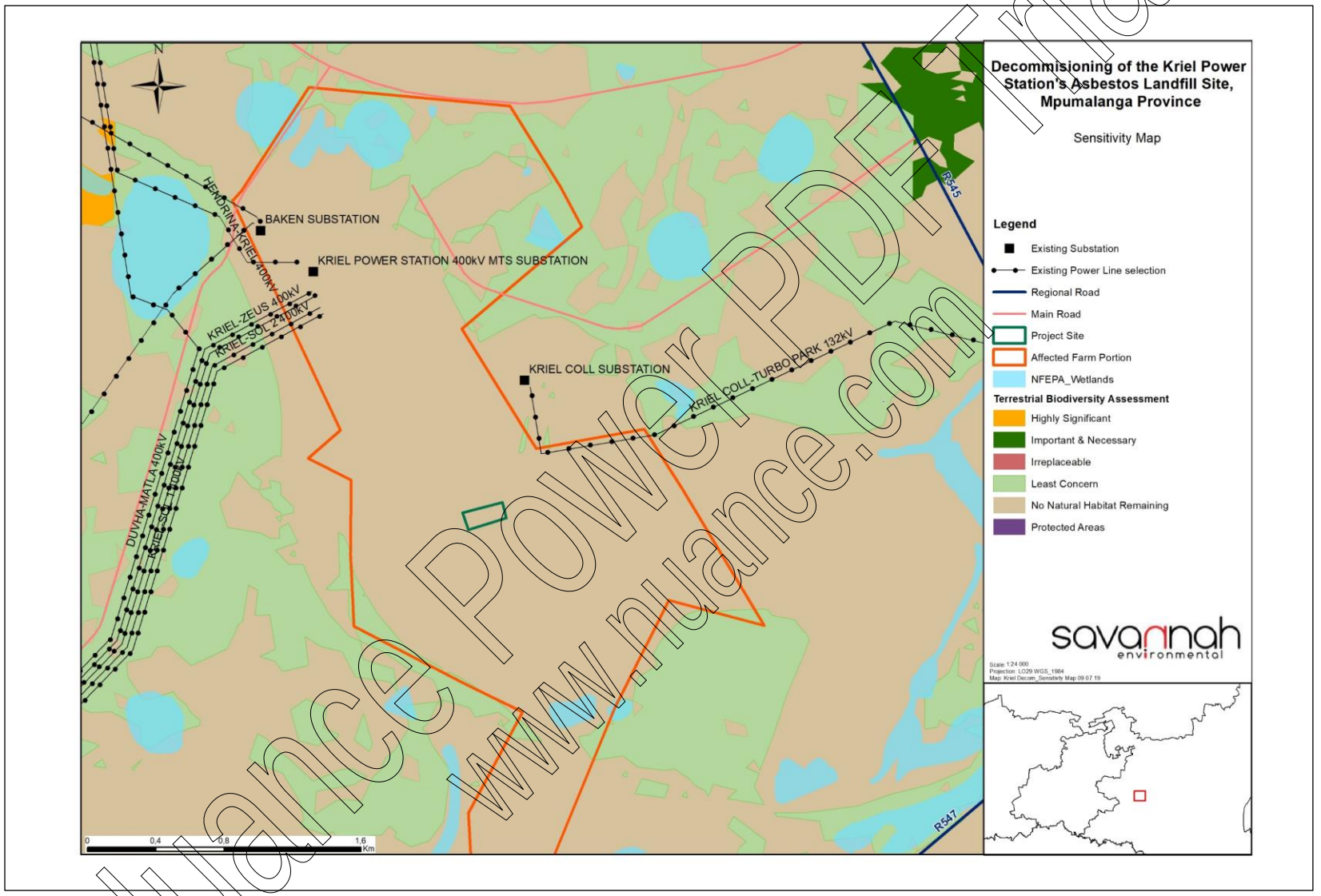

Figure 6.1: A sensitivity map showing the absence of sensitive environmental receptors within the vicinity of the ash dam and the asbestos landfill site. This data was obtained from SANBI's BGIS website (www. https://www.sanbi.org/link/bgis-biodiversity-gis/).

6.5. Environmental Costs and Benefits associated with the Decommissioning of Kriel Power Station's Asbestos Landfill Site

Minor environmental costs (relating to the natural environment) can be anticipated at a local and site-specific level and are considered to be acceptable provided the recommended mitigation measures outlined in Chapter 5 of this BA Report and the Closure Plan (**Appendix D**) are implemented and adhered to. Furthermore, no fatal flaws are associated with the decommissioning of the asbestos landfill site at the Kriel Power Station.

» *Impacts on groundwater quality* - The cost of the decommissioning of the asbestos landfill site to groundwater resources will be mitigated in accordance with the recommended mitigation measures included in this BA Report. However, the proponent, undertakes detailed monitoring studies of the boreholes around the ash dam and within the vicinity of the Kriel Power Station to monitor for any traces of pollutants in the groundwater resources in this area.

» *Impacts to surface water quality and soil contamination* – Numerous watercourses are located around the vicinity of Kriel Power Station and Ash Dam 1, with the closest watercourse/wetland located approximately 1.2km south-west of the asbestos landfill site and Ash Dam 1. However, as with the boreholes, the proponent continues to undertake detailed monitoring studies through an independent service provider.

Benefits of decommissioning the asbestos landfill site include the following:

» The proponent, Eskom SOC Holdings Limited would need not comply with the provisions of the permit issued in accordance with section 20 of the Environment Conservation Act (Act No. 73 of 1989) included in this BA Report as **Appendix E.** The permit provides for the following condition amongst many others detailed below:

  * *The Permit Holder shall take all reasonable steps to prevent the disposal of waste on the site for which the site has not been approved.*

» It for the above-mentioned condition that the proponent require a waste management licence in order to decommission the site through this application since this condition is no longer applicable to the site. However, other conditions within the permit remain applicable to the site even though operations have been discontinued by the proponent since 2008, these impacts include but not limited to ensuring effective access control to the site.

The benefits of the Decommissioning of the Kriel Power Station Asbestos Landfill Site are expected to occur at a site-specific level as the station will need not be compliant with certain provisions included in the permit as the station ceased disposing of asbestos waste at the landfill eleven years ago. Furthermore, should there be any costs to the environment associated with the decommissioning of the landfill, these are also anticipated to be a site-specific level due to, the site is completely encapsulated within the ash dam and the proponent has already implemented a monitoring programme for ground and surface water in accordance with the current operations of the ash dam. Therefore, as the benefits of decommissioning the asbestos landfill site outweigh the possible environmental costs, it is the opinion of the EAP that this project be granted the waste management licence by the Department of Environmental Affairs.

6.6. Overall Conclusion (Impact Statement)

Eskom SOC Holdings Limited as the proponent proposes the decommissioning of the asbestos landfill site at the Kriel Power Station. The site is no longer operational, and it is the intention of the proponent to decommission the site so as to no longer be operationally liable to the provisions of the authorisation/permit (included in this BA Report as **Appendix E**) issued by the then Department of Water and Forestry (DWAF) in 1992, and to reduce costs and streamline operations of the Kriel Power Station as a whole. The landfill site to be decommissioned was assessed as part of this BA process and this assessment was undertaken by an independent environmental assessment practitioner (EAP) and the findings have informed the results of this BA Report.

The findings of the BA process have identified that there are no environmental fatal flaws associated with the decommissioning of the asbestos landfill site. The assessment undertaken has concluded that the asbestos landfill site is considered appropriate for decommissioning since it is completely encapsulated within the ash layers at Ash Dam 1. All the impacts associated with the decommissioning of the asbestos landfill site can be mitigated to acceptable or enhanced through the implementation of the recommended mitigation measures. The site to be decommissioned has been overlain with sensitive environmental receptors included in **Figure 6.1**.

6.7. Overall Recommendation

Considering the findings from the BA process, the asbestos landfill site to be decommissioned by the proponent, the current status of the site, the implementation of the monitoring programme in accordance with the operations of the ash dam and the impacts identified, it is the reasoned opinion of the EAP that the decommissioning of the asbestos landfill site is acceptable within the landscape and can reasonably be granted a waste management licence.

The following key conditions would be required to be included within an authorisation for the decommissioning of the asbestos landfill site:

- All mitigation measures detailed within this BA Report are to be implemented; and
- The Closure Plan as contained within **Appendix D** of this BA Report should form part of the decommissioning of Kriel Power Station.

CHAPTER 7: REFERENCES

Emalahleni Local Municipality, 2009. *Spatial Development Framework.*

Emalahleni Local Municipality, 2015. *Spatial Development Framework*

Eskom, 2018. Terms of Reference. *Conduct a Basic Assessment Process with Associated Environmental Management Programme (EMPr) for Decommissioning of Kriel Power Station's Asbestos Landfill Site.*

Hancox, J.P., and Götz, A., 2014. *South Africa's coalfields-a 2014 perspective.*

Mpumalanga Economic Growth and Development Plan, 2011

Mpumalanga Provincial Spatial Development Framework, 2018

Mucina L. & Rutherford M.C. (eds) 2006. *The Vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

Nkangala District Municipality, 2017. *Spatial Development Framework (2017-2022)*