INTEGRATED ENVIRONMENTAL IMPACT ASSESSMENT:

PROPOSED EXPANSION OF ASH DISPOSAL FACILITY, KRIEL POWER STATION, MPUMALANGA

SCOPING REPORT

CONSULTANT

26 October 2016

Revision:0

Reference:

113084 / 11081

PROPONENT

Aurecon South Africa (Pty) Ltd

Reg No 1977/003711/07
Aurecon Centre
1 Century City Drive
Waterford Precinct
Century City
Cape Town 7441
PO Box 494
Cape Town 8000

T+27 21 526 9400
F+27 21 526 9500
E franci.gresse@aurecongroup.com

Eskom Holdings Ltd

Reg No 2002/015527/06
Eskom Generation
Megawatt Park
Maxwell Drive
Sandton 2199

PO Box 1091
Johannesburg 2000

T +27 11 800 2303
F +27 86 663 2051
E tobile.bokwe@eskom.co.za

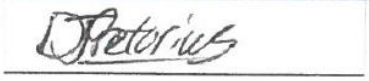
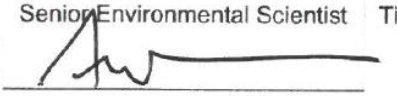
Document control record

A person using Aurecon documents or data accepts the risk of:

a) Using the documents or data in electronic form without requesting and checking them for accuracy against the original hard copy version.

b) Using the documents or data for any purpose not agreed to in writing by Aurecon.

Document control					aurecon
Report title		SCOPING REPORT			
Document ID		11081	**Project number**		113084 / 11081
File path		\\zacptpdc01\Shares\ZACPT\Projects\Projects\105719 Kriel PS Ash Dump EIA\0 New Project\3 Project delivery\2 Deliverables (Modify to needs)\3 dSR\Kriel Ash Disposal Facility Scoping_20160907.docx			
Client		Eskom Holdings Ltd			
Client contact		Tobile Bokwe	**Client reference**		Kriel EIA
Rev	**Date**	**Revision details/status**	**Author**	**Reviewer**	**Approver**
0	21 October 2016	Aurecon revision draft	Dirk Pretorius	Franci Gresse	Andries van der Merwe
Current revision		**0**			

Approval			
Author signature		Reviewer signature	
Name	Dirk Pretorius	Name	Franci Gresse
Title	Senior Environmental Scientist	Title	Senior Environmental Practitioner
Approver signature			
Name	Andries van der Merwe		
Title	Technical Director		

This report is to be referred to in bibliographies as: AURECON.2016. Integrated Environmental Impact Assessment Process: Proposed Expansion of Ash Disposal Facility, Kriel Power Station, Mpumalanga: Scoping Report. *Report No. 11081/113084*

Contents

Annexures

Figures

Tables

NEMA REQUIREMENTS WITH REFERENCE TO RELEVANT SECTIONS OF THIS REPORT

The Environmental Impact Assessment (EIA) process undertaken to date has culminated in the production of this Scoping Report (SR), which provides detailed information relevant to the project.

Table 1 illustrates how the structure of the SR addressed applicable requirements for information in terms of National Environmental Management Act (Act No. 107 of 1998) (NEMA).

Table 1 | EIA Regulations (GN No. 982 of 2014) requirements for Scoping Reports

Appendix 2	Content as required by NEMA	Section /Annexure
2(a)	(i) Details of the Environmental Assessment Practitioner (EAP) who prepared the report; and	Section1.6 Annexure A
	(ii) Details of the expertise of the EAP, including a curriculum vitae.	
2 (b)	The location of the activity, including:	Section 5.2.1
	(i) The 21 digit Surveyor General code of each cadastral land parcel;	
	(ii) Where available, the physical address and farm name;	
	(iii) Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	N/A
2 (c)	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is-	Figure 1-1
	(i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	NA
	(ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken;	
2 (d)	A description of the scope of the proposed activity, including:	Table 1-1 and Table 1-2
	(i) All listed and specified activities triggered;	
	(ii) A description of the activities to be undertaken, including associated structures and infrastructure;	Section 3
2 (e)	A description of the policy and legislative context within which the development is proposed, including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Section 1.2
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;	Section3.1.1
2 (h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including:	Section 2 and 3.3
	(i) Details of all the alternatives considered;	
	(ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 4
	(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;	To be included in final Scoping Report to DEA.
	(iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 2, 3.3 and 5
	(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Annexure B

Appendix 2	Content as required by NEMA	Section /Annexure
	(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;	
	(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;	Section 5
	(viii) The possible mitigation measures that could be applied and level of residual risk;	Annexure B
	(ix) The outcome of the site selection matrix;	Section 4
	(x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	NA
	(xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 3.3.5
2 (i)	A plan of study for undertaking the EIA process to be undertaken, including:	Section 6
	(i) A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	
	(ii) A description of the aspects to be assessed as part of the EIA process;	
	(iii) Aspects to be assessed by specialists;	
	(iv) A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;	
	(v) A description of the proposed method of assessing duration and significance;	
	(vi) An indication of the stages at which the competent authority will be consulted;	
	(vii) Particulars of the public participation process that will be conducted during the EIA process; and	
	(viii) A description of the tasks that will be undertaken as part of the EIA process;	
	(ix) Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	
2 (j)	An undertaking under oath or affirmation by the EAP in relation to:	Annexure A.2
	(i) The correctness of the information provided in the report;	
	(ii) The inclusion of comments and inputs from stakeholders and interested and affected parties; and	
	(iii) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	
2 (k)	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the EIA;	Annexure A.2
2 (l)	Where applicable, any specific information required by the competent authority; and	No specific information required by the competent authority has been requested to date.
2 (m)	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	N/A

GLOSSARY OF TERMS

Boiler Bottom Ash (BBA)	BBA is the larger ash particles that cannot rise and falls down into a pan below the boiler where it is quenched in water. The ash is therefore captured wet. The ash and water forming a slurry can be thickened to an optimal density before it is transported to site by means of pumping. BBA constitutes approximately 10-20% of the coal ash.
Environment	The surroundings (biophysical, social and economic) 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 wellbeing.
Environmental Impact Assessment (EIA)	A study of the environmental consequences of a proposed course of action.
Environmental Impact Report Assessment (EIR)	A report assessing the potential significant impacts as identified during the Scoping phase.
Environmental impact	An environmental change caused by some human act.
Environmental Management Programme (EMP)	A document that provides procedures for mitigating and monitoring environmental impacts, during the construction, operation and decommissioning phases.
General waste	"General waste" means waste that does not pose an immediate hazard or threat to health or to the environment, and includes: (a) domestic waste; (b) building and demolition waste; (c) business waste; (d) inert waste; or (e) any waste classified as non-hazardous waste in terms of the regulations made under section 69, and includes non-hazardous substances, materials or objects within the business, domestic, inert or building and demolition wastes.
Hazardous waste	"Hazardous waste" means 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 and includes hazardous substances, materials or objects within the business waste, residue deposits and residue stockpiles.
Lagoon	“Lagoon” means the containment of waste in excavations and includes evaporation dams, earth cells, sewage treatment facilities and sludge farms
Pulverised Fuel Ash (PFA)	PFA rises with the furnace gasses and is collected by electrostatic precipitators in, or, before the stacks or chimneys of the power station. The ash is therefore captured dry and is commonly referred to as fly ash. The ash can be conditioned by adding small amounts of moisture to ease handling by mechanical means and to reduce dust before it is transported to the deposition facility usually by troughed conveyors. PFA constitutes approximately 80% to 90% of the coal ash.
Public Participation Process	A process of involving the public in order to identify needs, address concerns, in order to contribute to more informed decision making relating to a proposed project, programme or development.
Scoping	A procedure for determining the extent of and approach to an EIA, used to focus the EIA to ensure that only the significant issues and reasonable alternatives are examined in detail.
Scoping Report	A report describing the issues identified.
Supernatant water	Clear water that lies above a sediment or precipitate.

Waste	(a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, by the holder of the substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or (b) any substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraph (a) and (b) ceases to be a waste - (i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered; (ii) where approval is not required, once a waste is or has been re-used, recycled or recovered; (iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or (iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste.

ABBREVIATIONS

CRR	Comments and Responses Report
DALA	Department of Agriculture and Land Administration
DARDLA	Department of Agriculture Rural Development and Land Administration
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DEAT	Department of Environmental Affairs and Tourism
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EAPSA	Environmental Assessment Practitioner of South Africa
EIA	Environmental Impact Assessment
EIR	Environmental Impact Assessment Report
EMP	Environmental Management Programme
GA	General Authorisation
GN	Government Notice
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IWULA	Integrated Water Use License Application
Mamsl	Meters above mean sea level
MBCP	Mpumalanga Biodiversity Conservation Plan
MBSP	Mpumalanga Biodiversity Sector Plan
Mtons	Metric tons
NEMA	National Environmental Management Act (No. 107 of 1998) (as amended)
NEMWA	National Environmental Management: Waste Act (No. 59 of 2008)
NHRA	National Heritage Resources Act (No. 25 of 1999)
NWA	National Water Act (No. 36 of 1998)
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SR	Scoping Report
ToR	Terms of Reference

1 INTRODUCTION AND BACKGROUND

The purpose of this Chapter is to introduce the project and describe the relevant legal framework within which the project takes place. Other applicable policies and guidelines are also discussed. The Terms of Reference, for the Environmental Impact Assessment (EIA), scope of and approach to the Environmental Impact Assessment are described and assumptions and limitations are stated.

1.1 Introduction

The construction of Kriel Power Station (owned by Eskom Holdings SOC Limited (Eskom)) was completed in 1979 and it was considered to be the largest coal-fired power station in the southern hemisphere at the time (see Figure 1-1). The 37 year old power station with an installed capacity of 3 000 MW (Eskom, 2010) is situated about 7 km east of the small town of Kriel (also known as Ga-nala[1]) in the Mpumalanga Province. Through the process of electricity generation coarse and fine ash is produced by burning coal. At full capacity, each of the six boilers can produce up to 740 000 tonnes/year of coarse ash/ boiler bottom ash (approximately 20% of total ash produced) ash and 2 960,000 tonnes/year of fly ash/ precipitator fly ash (approximately 80% of total ash produced). The Kriel Power Station makes use of a wet ashing process to dispose of its ash. Coarse ash is transferred with a small volume fine ash (fly ash, to limit pipeline wear) from the Power Station to sumps from where it is pumped as a slurry mixture to the ash dams. The fine ash is transported separately[2] to the existing ash dam complex *via* two conveyors[3]that are located south-east of Kriel Power Station. All the water collected from the Kriel ash dams are stored in the ash water return (AWR) dam. From the AWR dams the water gravitates to a manifold and is then pumped back to a High Level AWR dam. From there the water gravitates to the borrow pits and to Swartpan. The power station then pumps water from Swartpan for re-use by the Power Station for ashing purposes (Kriel Power Station, 2016).

The three existing ash dams will reach a limiting Rate of Rise (RoR) by end July 2021 (see Figure 1-2). Eskom is thus proposing to construct and commission an additional Ash Disposal Facility before the existing ash dams reach their limiting RoR in 2021. The new dams would fulfil the ash disposal requirements for the Power Station's extended operational life, with decommissioning of the six generating units planned to commence in 2036. A five year contingency has been allowed for, thus it's assumed that the Power Plant will be operated for an additional five years at full load from 2036 to 2040, with final decommissioning date proposed for 2045.The total ash stream to be accommodated on the existing and new dams from 2021 to 2045 is 71.5 Metric tons (Mtons). Available proposals for the establishment of the additional Ash Disposal Facility include expanding the existing ash dam complex to include a fourth Ash Disposal Facility.

The project requires the following components:

- An Ash Disposal Facility that would have sufficient capacity to store ash volumes produced up to 2045;
- An AWR dam from where decant and drained water will be pumped back to the power station for re-use;
- An AWR transfer dam;
- Delivery and return infrastructure, including conveyor belts and/ or pipelines, transfer houses, pump stations;
- Clean and dirty water channels;
- Powerlines; and
- Access roads.

[1] Kriel name change to Ga-nala in accordance to Government Notice No.113, 10 February 2006
[2] The moisture content of water to fly ash is 10:1.
[3]One conveyor belt is normally in service with one on standby.

In terms of the National Environmental Management Act (No. 107 of 1998) (as amended) (NEMA), the proposed development triggers a suite of activities, which require authorisation from the competent environmental authority before they can be undertaken. Furthermore, the National Environmental Management: Waste Act (No. 59 of 2008) (NEMWA) provides various measures for the prevention of pollution and ecological degradation, as well as for ecologically sustainable development in order to protect human health and the environment. In this regard, NEMWA identifies and lists certain activities which require environmental authorisation through the NEMA EIA and waste management licensing processes, prior to commencement of those activities. Eskom appointed Aurecon South Africa (Pty) Ltd, an independent company, to conduct the EIA process required, to evaluate the potential biophysical and socio economic impacts of the proposed project and undertake the required waste licensing processes.

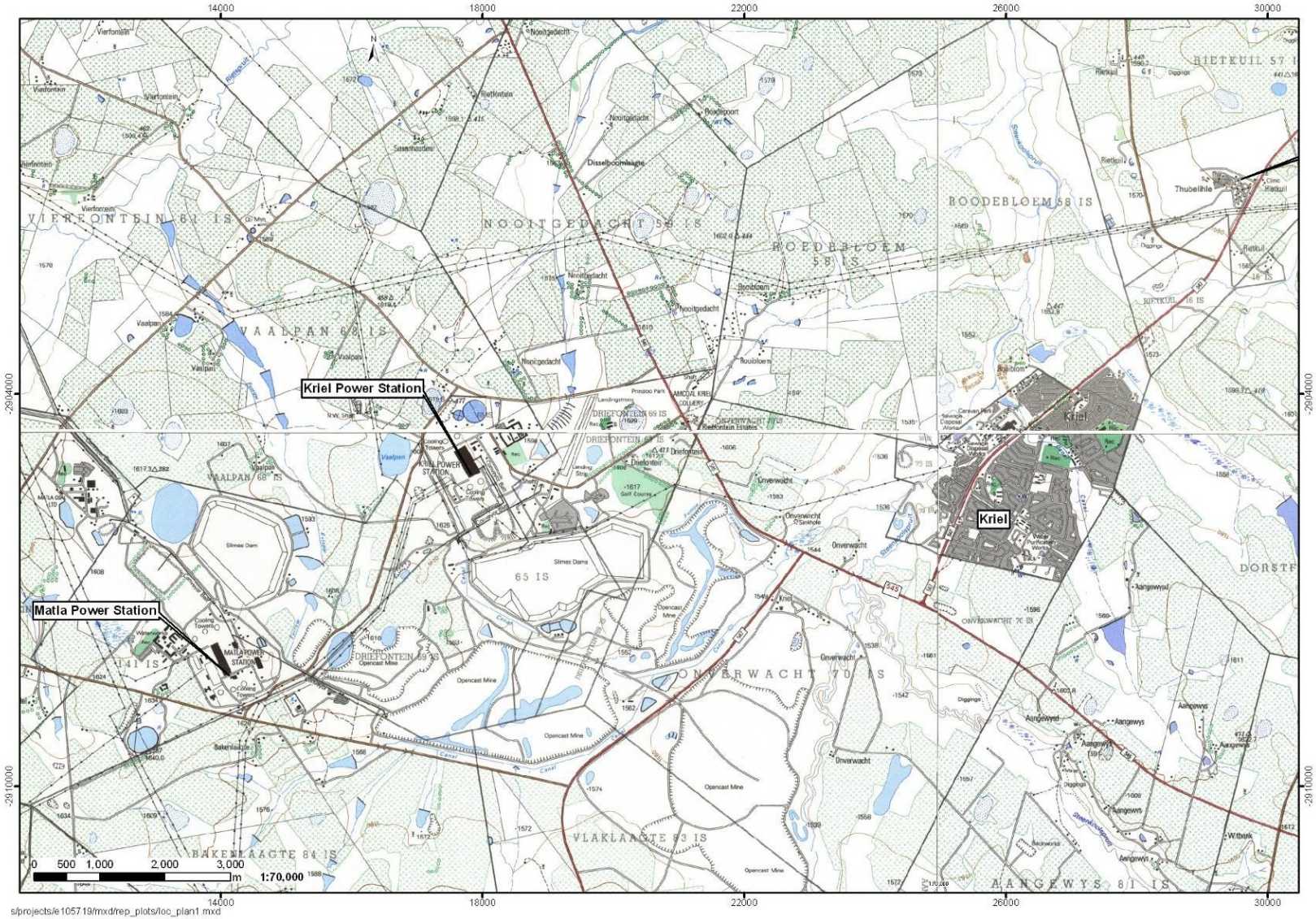


Figure 1-1 | Location of the Kriel Power Station

Figure 1-2 | Aerial photograph of the Kriel Power Station and existing ash dam complex

As this proposed project triggers a number of listed activities in terms of NEMA and NEMWA, it accordingly requires environmental authorisation and a waste management licence, thus an Integrated Environmental Authorisation process will be followed. Since Eskom is a State Owned Enterprise (SOE), and Kriel Power Station is in the Eskom Generation fleet, the competent authority is the national Department of Environmental Affairs (DEA). DEA's decision will be based on the outcome of this EIA process.

This report serves to document the Scoping Phase of the EIA process Figure 1-3. The EIA process will integrate the requirements for both the environmental authorisation and waste management licensing in order to obtain a streamlined decision-making process.

The purpose of this Scoping Report is to provide the background and outline the scope of work proposed to be undertaken in the EIA Report (EIR) phase. Accordingly, the Scoping Report:

- **Chapter 1 Introduction and Background**

The purpose of this Chapter is to introduce the project and describe the relevant legal framework within which the project takes place. Other applicable policies and guidelines are also discussed. The Terms of Reference, for the EIA, scope of and approach to the EIA are described and assumptions and limitations are stated.

- **Chapter 2 Site selection process**

The purpose of this chapter is to document and describe the process and rationale by which the proposed sites were identified and selected. It describes the regional boundaries within which the sites were identified and the criteria used to identify potential sites.

- **Chapter 3 The Proposed Development**

This chapter considers the need for the proposed project, briefly outlines the nature of the proposed activities and then considers and screens the various project alternatives in order to focus the EIA Phase on the most feasible alternatives.

- **Chapter 4 The public participation process**

The purpose of this Chapter is to provide an outline of the Public Participation Process, a summary of the process undertaken to date, and the way forward with respect to public participation throughout the EIA process for this project. This Chapter also provides a summary of the key issues that have been raised to date.

- **Chapter 5 Description of affected environment and potential impacts**

The purpose of this Chapter is to provide a description of the affected environment and the potential impacts that could result from the proposed project. Where additional information is required for detailed assessment in the EIR, the ToR for specialist studies are provided.

- **Chapter 6 Plan of study for EIA**

The purpose of this Chapter is to detail the Plan of Study for the EIA Phase to ensure that this EIA process satisfies the requirements of NEMA.

- **Chapter 7 Conclusions and way forward**

The purpose of this Chapter is to summarise and conclude the Scoping Report and describe the way forward.

- **Chapter 8 Reference**

Reference material and literature used to inform report.

1.2 Legal requirements

1.2.1 The Constitution Act (No 108 of 1996)

Section 24 of the Constitution relates to environmental rights and states that: Everyone has the right

1. to an environment that is not harmful to their health or well-being; and
2. to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:
   a. prevent pollution and ecological degradation;
   b. promote conservation; and
   c. secure ecologically sustainable development and use of natural resources, while promoting justifiable economic and social development.

The current environmental laws in South Africa concentrate on protecting, promoting, and fulfilling the Nation's social, economic and environmental rights; while encouraging public participation, implementing cultural and traditional knowledge and benefiting previously disadvantaged communities.

Section 27 of the Constitution states that:

1. Everyone has the right to have access to
   a. health care services, including reproductive health care;
   b. sufficient food and water; and
   c. social security, including, if they are unable to support themselves and their dependants, appropriate social assistance.
2. The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights.

Furthermore, cognisance should also be taken of chapters and sections in the Constitution Act (No 108 of 1996):

- Chapter 2 Bill of Rights;
- Section 25 Rights in property;

- Section 32 Administrative justice; and
- Section 33 Access to information.

1.2.2 National Environmental Management Act, No. 107 of 1998

NEMA, as amended, establishes the principles for decision-making on matters affecting the environment. Section 2 sets out the National Environmental Management Principles which apply to the actions of organs of state that may significantly affect the environment. Furthermore, Section 28(1) states that "every person who causes or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring". If such pollution cannot be prevented then appropriate measures must be taken to minimise or rectify such pollution.

Eskom has the responsibility to ensure that the proposed activity as well as the EIA process conforms to the principles of NEMA. In developing the EIA process, Aurecon has been cognisant of this need, and accordingly the EA process has been undertaken in terms of NEMA and the EIA Regulations promulgated on 4 December 2014, see Figure 1-3 below.

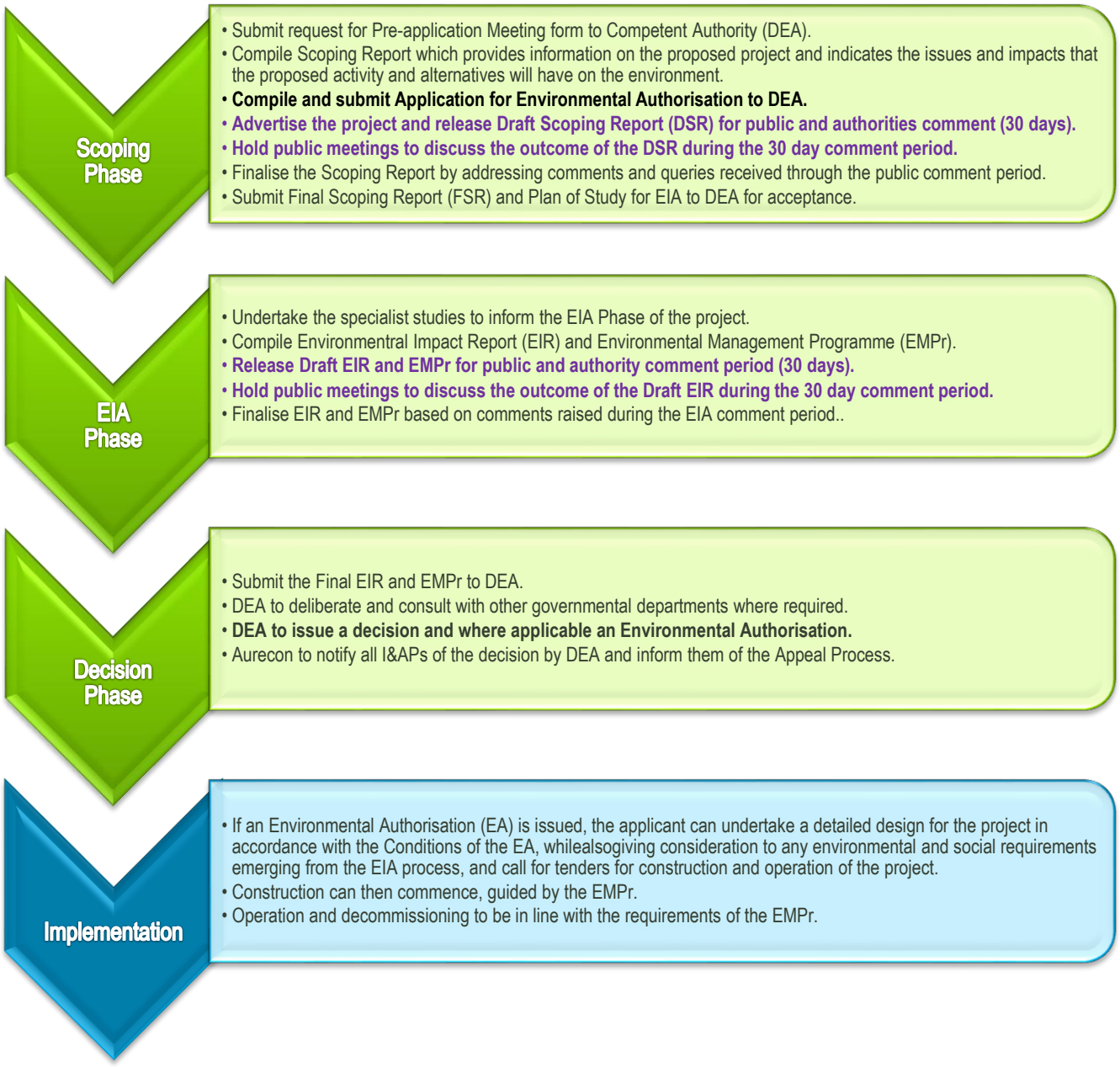


Figure 1-3 | EIA process to be followed for the proposed Kriel Ash Disposal Facility

In terms of the EIA regulations, certain activities are identified, which require authorisation from the competent environmental authority, in this case DEA, before commencing. Listed activities in Government Notice Regulation (GN R.) 984 require Scoping and EIA, whilst those in GN R. 983 and 985 require Basic Assessment (unless they are being assessed under an EIA process). The activities being applied for in this EIA process are listed in Table 1-1.

Table 1-1 | Listed activities in terms of NEMA GN R983, R984 and R985, December 2014, to be authorised for the proposed Ash Disposal Facility

Listed activity as described in GN R. 983, GN R. 984 and GN R.985	**Description of project activity that may trigger the listed activity**
GN R.983 Item 10 The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, **process water, waste water, return water, industrial discharge** or slimes (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of **120 litres per second** or more;	The proposed Kriel Ash Disposal Facility would make use of various pipelines to transport process water, waste water, return water and water which contains waste from, or which has been heated in, any industrial or power generation process to and from the ash facility. The transfer dam pump station and pipeline will pump 480m^3/hr (**133.3 litres per second**) process and storm water to the AWR dam through a 350mm diameter pipeline. **Slurry delivery system** • Two 400mm diameter pipes. **The decant system pipes consisting of:** • Permanent penstock steel outfall pipes, 10mm thick flanged on top of leachate collection layer of between **650mm-750mm diameter;** and • Temporary penstock **750mm diameter.** **Ash Deposition System** • Pipeline to ash dam up to **500 mm diameter**
GN R.983 Item 12 The development of - (i) canals exceeding 100 square metres in size; (ii) channels exceeding 100 square metres in size; (iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size; (xii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;	A silt trap and transfer dam is proposed to be constructed in a depression, which could be classified as a watercourse and would thus trigger the activity being infrastructure within a watercourse. There will also be clean and dirty water containment systems, which would constitute canals, channels and retention dams.
GN R.983 Item 19 The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from- (i) a watercourse	A silt trap and transfer dam would be located in a depression, which could be classified as a watercourse and would thus trigger the activity because more than 5m^3 of material would be infilled and removed within a watercourse.
GN R.983 Item 24 The development of- (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;	Internal roads of wider than 8m may be constructed to provide access to Ash Disposal Facility infrastructure.

Listed activity as described in GN R. 983, GN R. 984 and GN R.985	**Description of project activity that may trigger the listed activity**
GN R.983 Item 34 The expansion or changes to existing facilities for any process or activity where such expansion or changes will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions or pollution, excluding- (i) where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or (ii) the expansion of or changes to existing facilities for the treatment of effluent, wastewater or sewage where the capacity will be increased by less than 15 000 cubic metres per day.	The expansion of the Ash Disposal Facility will require the amendment of the Air Emissions Licence and Water Use Licence for the facility.
GN R.983 Item 45 The expansion and related operation of infrastructure for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes where the existing infrastructure- (i) has an internal diameter of 0,36 metres or more; or (ii) has a peak throughput of 120 litres per second or more; and (a) where the facility or infrastructure is expanded by more than 1000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more;	This activity adds on to the infrastructure listed under GN R.983 Item 10. Because the proposed activity relates to the construction and operation of a new ash dam, which would expand the footprint of the current ash dam complex, the activity triggers the development, operation and expansion of infrastructure in this case pipeline infrastructure.
GN R.983 Item 48 The expansion of- . (i) canals where the canal is expanded by 100 square metres or more in size; (ii) channels where the channel is expanded by 100 square metres or more in size; (iv) dams, where the dam, including infrastructure and water surface area, is expanded by 100 square metres or more in size; (vi) bulk storm water outlet structures where the bulk storm water outlet structure is expanded by 100 square metres or more in size; or where such expansion or expansion and related operation occurs- (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;	The silt trap no.2, transfer dam and permanent effluent trench (channel) is proposed to be constructed in a depression, which could be classified as a watercourse and would thus trigger the activity
GN R.983 Item 49 The expansion of - (v) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; where such expansion or expansion and related operation occurs- (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;	The expansion of infrastructure including silt trap no.2, transfer dam and permanent effluent trench (channel) is proposed to be constructed in a depression, which could be classified as a watercourse and would thus trigger the activity.
GN R.983 Item 56	Internal roads of wider than 8 meters might be lengthened by more than 1km.

Listed activity as described in GN R. 983, GN R. 984 and GN R.985	**Description of project activity that may trigger the listed activity**
The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre- (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres;	
GN R.984 Item 15 The clearance of an area of 20 hectares or more of indigenous vegetation.	The footprint of the proposed Ash Disposal Facility would be approximately 172ha. Of this are it's likely that more than 150 hectares of vegetation be cleared. Of this 150ha it's very likely that more than 20ha of vegetation could cumulatively constitute as natural and thus this activity is triggered. This vegetation mainly consists of natural grasses.
GN R.984 Item 16 The development of a dam where the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, is 5 metres or higher or where the high water mark of the dam covers an area of 10 hectares or more.	The new starter dam walls are proposed to have a height of 11m (AD4.1) and 11m (AD4.2) respectively. The AWR dam will have an outer wall height of 17.2m.
GN R.985 **None of the geographic areas trigger.** **The proposed site is mapped as heavily to moderately modified Mpumalanga Biodiversity Sector Plan (MBSP, 2014).** **Please refer to Figure 4 to 9 under additional information.**	

1.2.3 National Environmental Management: Waste Act, No. 59 of 2008

NEMWA seeks to reform the law on waste management by making provision for various measures for the prevention of pollution and ecological degradation, as well as ecologically sustainable development in order to protect communities and the environment through waste management. In this regard, NEMWA provides for national norms and standards for regulating waste management in all spheres of government and provides for the licensing and control of waste management activities, as well as the remediation of contaminated land.

The objectives of NEMWA include minimising the consumption of natural resources; avoiding and minimising the generation of waste; reducing, re-using, recycling and recovering waste; treating and safely disposing of waste as a last resort; promoting and ensuring the effective delivery of waste services; remediating land where contamination presents or may present a significant risk of harm to health or the environment; and achieving integrated waste management reporting and planning. Generally, the Act seeks to ensure that people are aware of the impact of waste on their health, well-being and the environment and to give effect to the constitutional right in order to secure an environment that is not harmful to one's health or well-being.

The proposed project triggers activities listed under NEMWA and therefore a waste management licence is required. The activities in terms of NEMWA, GN No. 921 of 29 November 2013, Category B, being applied for in this EIA process is listed in Table 1-2. These triggers depend on the classification of the ash in terms of NEMWA.

Table 1-2 | Listed activities in terms of NEMWA, List of waste management activities that have, or are likely to have, a detrimental effect on the environment

NO.	LISTED ACTIVITY	
Category A		
1	The storage of general waste in lagoons.	Storage of ash water in AWR dams. Depending on waste classification.
Category B		
1	Storage of hazardous waste (1) The storage of hazardous waste in lagoons excluding storage of effluent, wastewater or sewage.	Storage of ash return water in AWR dams. Depending on waste classification.
7	The disposal of any quantity of hazardous waste to land.	Disposal of ash in ash dams. Depending on waste classification.
8	The disposal of general waste to land covering an area in excess of 200m^2 and with a total capacity exceeding 25 000 tons.	Disposal of ash return water in AWR dams Disposal of ash to ash dams.
10	The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).	Activity 1 and 7.

1.2.4 National Heritage Resources Act, No. 25 of 1999

In terms of the National Heritage Resources Act (No. 25 of 1999) (NHRA), any person who intends to undertake "any development … which will change the character of a site exceeding 5 000 m^2 in extent", "the construction of a road…powerline, or pipeline…exceeding 300 m in length" must at the very earliest stages of initiating the development notify the responsible heritage resources authority, namely the South African Heritage Resources Agency (SAHRA) or the relevant provincial heritage agency. These agencies would in turn indicate whether or not a full Heritage Impact Assessment (HIA) would need to be undertaken.

Section 38(8) of the NHRA specifically excludes the need for a separate HIA where the evaluation of the impact of a development on heritage resources is required in terms of an EIA process. Accordingly, since the impact on heritage resources would be considered as part of the EIA process outlined here, no separate HIA would be required. SAHRA or the relevant provincial heritage agency (Mpumalanga Heritage Resources Authority) would review the EIA reports and provide comments to DEA, who would include these in their final environmental authorisation decision. However, should a permit be required for the damaging or removal of specific heritage resources, a separate application would have to be submitted to SAHRA or the relevant provincial heritage agency for the approval of such an activity, if Eskom obtains authorisation and makes the decision to pursue the proposed project further.

1.2.5 Other applicable legislation and policies

A. National Water Act, No. 36 of 1998

The National Water Act (No. 36 of 1998) (NWA) protects and conserves water resources (i.e. rivers, wetlands, estuaries and groundwater), provides absolute water rights for basic human needs and aims to secure ecological sustainable development and use of South Africa's water resources. In terms of Section 21 of the NWA, the taking of water from a water resource; storing of water; impounding or diverting the flow of water in a water course; altering the bed, bank, course or characteristics of a watercourses; disposing of waste in a manner which may impact on a water resource and the disposal of water which contains waste or which has been heated through a power generation process are all considered water uses, which in general must be licensed, unless permitted as a Schedule 1 activity, or permissible in

terms of a General Authorisation (GA) under Section 39 of the Act. Schedule 1 activities relate mostly to small scale domestic usage of water and would therefore not be applicable to the proposed project.

Eskom's Environmental Department: Water has applied for the requisite license, on behalf of the Kriel Power Station, as part of an Integrated Water Use License Application (IWULA) from the Department of Water and Sanitation (DWS). Information from the IWULA will be incorporated into the EIA and public participation process where relevant.

B. Conservation of Agricultural Resources Act, No. 43 of 1983

The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) makes provision for the conservation of the natural agricultural resources of South Africa through maintaining the production potential of land, combating and preventing erosion, preventing the weakening or destruction of the water sources, protecting vegetation and combating weeds and invader plants. In terms of Regulation 7 of CARA no land user may drain or cultivate a vlei, marsh or water sponge, except with written permission from the Department of Agriculture. However, this regulation is only relevant if the land is zoned for agriculture.

C. National Environmental Management: Air Quality Act, No. 39 of 2004

The National Environmental Management: Air Quality Act, No. 39 of 2004 (NEMAQA), National Dust Control Regulations, 2013 (Government Notice R827 of 1 November 2013) makes provision for dust fall standards, the control of dust and prevention of nuisance by dust in addition to measures for the control of dust. During the construction and operation of the Ash Disposal Facility, dust must be prevented by taking the requisite control measures. Furthermore, section 35 of NEMAQA relates to the control of offensive odours to ensure that offensive odours are limited by any of the activities of Eskom in constructing and operation of the Ash Disposal Facility.

An Atmospheric Emission License (AEL) (No. 17/4/AEL/MP312/11/09) was issued to Kriel Power Station by the Mpumalanga MEC on 6 June 2013, in terms of Section 47(1) of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEMAQA) in respect of Scheduled Process No. 29 (Power Generation) and Scheduled Process No. 59 (Bulk Storage and Handling of Ore or Coal). An amended AEL was issued on 10 September 2013. The AEL is valid until 20 May 2017 and replaces the APPA Registration Certificate. The AEL specifies permissible stack emission concentrations for Particulate Matter, Sulphur dioxide (SO_2) and oxides of Nitrogen (NO_x). It also specifies a number of compliance conditions as well as conditions for emission monitoring, management of abnormal releases and management of fugitive dust resulting from coal handling and storage.[4]

D. Occupational Health and Safety Act, No. 85 of 1993

In terms of Occupational Health and Safety Act, No. 85 of 1993 (OHSA) specifically GN R1179 (GG 16536 of 25 August 1995 – Hazardous Chemical Substances Regulations) the regulations contain provisions regarding the handling of hazardous substances primarily aimed at the occupational hygiene side thereof, including the assessment of potential exposure, medical surveillance, PPE, etc. Eskom use fuels, oils, solvents, etc. and these regulations need to be taken cognizance of in terms of the transport, storage, handling and disposal thereof.

E. National Environmental Management: Protected Areas Act, No 57 of 2003

The National Environmental Management: Protected Areas Act, No 57 of 2003 (NEM: PA) came into operation on 1 November 2004. The aim of the NEM: PA, as amended, is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes and seascapes. In 2004, the National Environmental Management: Protected Areas Amendment Act 31 of 2004 was promulgated to amend Act 57 of 2003 with regard to the application of that Act to national parks and marine protected areas. The proposed Kriel Ash Disposal Facility will not be situated in or near any protected areas. However, NEMPA was considered during initial site considerations for the expansion of the Ash Disposal Facility.

[4]Atmospheric Impact Report in support of Eskom's application for postponement of the minimum emission standards compliance timeframes for the Kriel Power Station. December 2013. UMoya-NILU Consulting (Pty) Ltd.

F. Hazardous Substances Act, No. 15 of 1973

In terms of the Hazardous Substances Act, No. 15 of 1973 Eskom must identify the various groups of hazardous substances which will be used in terms of the expansion of the ash disposal facilities. These substances should be classed in terms of SANS10228 to ensure that they are properly stored and that the Material Safety Data Sheets are in place in the event of a spill.

G. Explosives Act, No. 26 of 1956 and R1604 of September 1972

The Explosives Act, No. 26 of 1956 and R1604 of September 1972 will be applicable to the development in the event that blasting will take place during construction. The Act relates to the use, handling, transport, storage and disposal of explosives. It's not possible to conclude if blasting will take place at this stage because the EIA is done at feasibility level and therefore this act remains relevant until ascertained otherwise.

H. Spatial Planning and Land Use Management Act, No. 16 of 2013 (SPLUMA)

The land parcels on which the current and proposed expansion of the Ash Disposal Facility is planned are currently zoned as agricultural. Eskom Real Estate is currently in a process to get the station to be correctly rezoned to either industrial or commercial or public services infrastructure. The rezoning category will depend on the decision from the Emalahleni Local Municipality planning department. Construction of the facility cannot occur until a) a rezoning application for the change in zoning/land use of the land is submitted to and approved by the Emalahleni Local Municipality in terms of SPLUMA, or b) a Consent Use is granted by the Emalahleni Local Municipality in terms of the Emalahleni Town Planning Scheme.

I. National Road Traffic Act, No. 93 of 1996 (as amended) (NRTA)

Certain vehicles and loads cannot be moved on public roads without exceeding the limitations in terms of the dimensions and/or mass as prescribed in the Regulations of the NRTA. Although abnormal loads are not anticipated, Mpumalanga Department of Public Works, Roads & Transport will be provided with an opportunity to comment on the proposed project.

J. Guidelines

This EIA process is informed by the series of national Environmental Guidelines[5] where applicable and relevant:

- Integrated Environmental Information Management, Information Series 2: Scoping (Department of Environmental Affairs and Tourism. (DEAT), 2002).
- Integrated Environmental Information Management, Information Series 3: Stakeholder Engagement. (DEAT, 2002).
- Integrated Environmental Information Management, Information Series 4: Specialist Studies. (DEAT, 2002).
- Integrated Environmental Management, Information Series 11: Criteria for determining Alternatives in EIA. (DEAT, 2004).
- Integrated Environmental Information Management, Information Series 12: Environmental Management Plans (DEAT, 2004).
- Integrated Environmental Information Management, Information Series 3: General Guide to the EIA Regulations. (DEAT 2006).
- Integrated Environmental Information Management, Information Series 4: Public Participation in support of the EIA regulations (DEAT 2006).
- Integrated Environmental Information Management, Information Series 5: Assessment of Alternatives and Impacts (DEAT 2006).
- Integrated Environmental Management Guideline Series, Guideline 7: Detailed Guide to Implementation of the EIA Regulations. Unpublished (DEAT, 2007).
- Guideline on Need and Desirability, Integrated Environmental Management Guideline Series 9 (DEA, 2010).

[5] Note that these Guidelines have not yet been subjected to the requisite public consultation process as required by Section 74 of R385 of NEMA.

- Public Participation 2010, Integrated Environmental Management Guideline Series 7 (DEA, 2010).
- Guidelines to minimise the impact on birds of Solar Facilities and Associated Infrastructure in South Africa (Smit, 2012).
- Guideline on Need and Desirability, EIA Guideline and Information Document Series (Department of Environmental Affairs and Development Planning (DEA&DP), 2013).
- Guideline on Alternatives, EIA Guideline and Information Document Series (DEA&DP 2013).

In particular, in 1998, DWAF (now DWS) published a Waste Management Series consisting of Minimum Requirements (DWAF, 1998) that represent the lowest acceptable standards for:

- The handling, classification and disposal of hazardous waste; and
- The monitoring of water quality at waste management facilities.

However the DEA's Waste Classification and Management Regulations (August 2013) is currently the official waste classification system, thus previous ash samples classified in terms of the DWS Minimum Requirements as was the applicable system at the time of the initial Ash Classification study (2011) is no longer relevant. The ash will be reclassified as part of the EIA in terms of NEMWA.

K. Relevant Policies

The following policies, although not directly applicable to the proposed project, were also considered:

- Policies regarding greenhouse gas and carbon emissions;
- White Paper on the Energy Policy of the Republic of South Africa (1998);
- National Integrated Resource Plan (IRP) (2010) and Update Report (2013); and
- The National Development Plan 2030 (2012).

1.3 Terms of reference and Scope of the EIA

In November 2009, Eskom appointed Aurecon to undertake an EIA process for the proposed construction of an Ash Disposal at the Kriel Power Station in Mpumalanga (DEA EIA Ref. No: 12/12/20/1837 / DEA WML Ref No. 12/9/11/L514/6). In 2011 the EIA process was stopped after the Final Scoping phase to allow detailed geotechnical investigation to be undertaken at Site 10 to ensure that the proposed ash disposal infrastructure would be supported by the underlying backfilled excavations located at this site. In 2016 the geotechnical investigations undertaken by Jones & Wagener were concluded and Eskom could proceed with the EIA process. Due to the time lapsed and numerous legislative changes since 2011 the DEA requested that the EIA process be started from anew in terms of the 2014 EIA regulations. Although five years have lapsed since the process was stopped, much of the scoping undertaken in terms of the previous process is still relevant and therefore this scoping is fundamentally a refinement and update of the previous scoping exercise. An Integrated Environmental Authorisation and a Waste Management Licence are being sought for the proposed project in terms of NEMA and NEMWA. Eskom is in the process of applying for a Water Use Licence for the proposed project in terms of NWA.

1.4 Approach to the project

There are three distinct phases in the EIA process namely the Scoping, EIA and decision making phases. The EIA process is diagrammatically represented in Figure 1-3. This report covers the Scoping Phase of the EIA process. The Scoping Phase will be followed by the EIA Phase, which will culminate in a comprehensive document, the EIR.

1.4.1 The Scoping Phase

Scoping in the EIA process is the procedure used for determining the extent of, and approach to, the EIA Phase and involves the following key tasks:

- Further identification and involvement of relevant authorities and Interested and Affected Parties (I&APs) in order to elicit their interest in the project;
- Identification and selection of feasible alternatives to be taken through to the EIA phase;
- Identification of significant issues/ impacts associated with each alternative to be examined in the EIR, and mitigation measures that can be applied.
- Determination of specific Terms of Reference (ToR) for any additional specialist studies required in the EIR Phase (i.e. the Plan of Study for the EIR).

Various methods and sources were utilised to identify the potential social and environmental aspects associated with the proposed project and to develop the ToR for the specialist studies. The sources of information for the preparation of this report include, amongst others, the following:

- Collection of information regarding the project, as provided by Eskom:
  - Project description;
  - Methodology for construction of the various project components;
  - Methodology during operations;
  - Expected time table for project development;
  - Maps and figures, outlining the proposed facilities; and
  - Technical information relating to design.
- Other relevant EIRs;
- Environmental baseline surveys for this site and surrounding areas;
- Consultation with the project team; and
- Consultation with I&APs, including authorities.

The applicant has 44 days to submit Scoping Report (SR) after receipt of application. During the Scoping Phase, the SR must be subjected to at least a 30-day PPP. Therefore, the SR will be made available for public comment and review, from 26 October 2016 to 28 November 2016. On completion of the public comment period, the SR will be updated and finalised, taking cognisance of any comments received or issues raised by I&APs.

Once the SR has been completed it will be submitted to the DEA for review. The DEA must within 43 days of receipt of the SR, consider it, and in writing –

(a) Accept the report and advise the EAP to proceed with the tasks contemplated in the Plan of Study for EIA;

(b) Refuse Environmental Authorisation if

(i) The proposed activity is in conflict with a prohibition contained in legislation, or

(ii) If the Scoping Report does not substantially comply with the objectives and content requirements for scoping reports in terms of the 2014 EIA Regulations and the applicant cannot ensure compliance with these regulations within the prescribed timeframe.

1.4.2 The EIR Phase

The Scoping Phase will be followed by the EIR Phase, which will be informed by the specialist investigations. The applicant has 106 days to submit the (EIR) after acceptance of this SR. This phase will culminate in a comprehensive EIR that documents the outcome of the impact assessments.

1.4.3 The Public Participation Process (PPP)

The PPP will be undertaken to ensure participatory consultation with members of the public are undertaken in a manner that provides the public an opportunity to comment on the proposed project. Consultation with the public forms an integral component of this investigation and enables I&APs (e.g. directly affected landowners, authorities,

environmental groups, civic associations and communities), to identify their issues and concerns, relating to the proposed activities, which they feel should be addressed in the EIA process. Comments on the scoping report, EIR and decision by DEA will be solicited from the public. The objectives of public participation are to provide information to the public, identify key issues and concerns at an early stage, respond to the issues and concerns raised, provide a review opportunity, and to document the process properly.

1.5 Assumptions and limitations

1.5.1 Assumptions

In undertaking this investigation and compiling the Scoping Report, the following has been assumed:

- The strategic level investigations undertaken by Eskom prior to the commencement of the EIA process are technologically acceptable and robust.
- The information provided by the applicant and specialists is accurate and unbiased.
- The scope of this investigation is limited to assessing the environmental impacts associated with the proposed expansion of the Ash Disposal Facility, and associated infrastructure, at the Kriel Power Station.
  - The EIA does not assess any other waste streams (except that of the ash created by the burning of coal) or materials generated at the Kriel Power Station.
  - The EIA does not assess the merit of coal fired electricity or associated impacts.
- The IWULA is not part of this EIA process, as Eskom's Environmental Department: Water is currently applying for the license in a separate process.
- No ash dams will be constructed over backfilled areas, but associated infrastructure that does not pose potential subsidence risk may be constructed over these areas.

1.5.2 Gaps in knowledge

This Scoping Report has identified the potential environmental impacts associated with the proposed activities. However, the scope of impacts presented in this report could change, should new information become available during the EIA Phase. The purpose of this section is therefore to highlight gaps in knowledge when the Scoping phase of the project was undertaken.

The planning for the proposed Ash Disposal Facility and its associated infrastructure is at a feasibility level and therefore some of the specific details are not available at this stage of the EIA process. This EIA process forms a part of the suite of feasibility studies, and as these studies progress, more information will become available to inform the EIA process. This will require the various authorities, and especially DEA, to issue their comments and ultimately their environmental decision to allow for the type of refinements that typically occur during these feasibility studies and detailed design phase of projects. Undertaking the EIA process in parallel with the feasibility study does however have a number of benefits, such as integrating environmental aspects into the layout and design and therefore ultimately encouraging a more environmentally sensitive and sustainable project.

1.6 Independence

The requirement for independence of the environmental consultant is aimed at reducing the potential for bias in the environmental process. Neither Aurecon nor any of its sub-consultants are subsidiaries of Eskom. Furthermore, all these parties do not have any interests in secondary or downstream developments that may arise out of the authorisation of the proposed project.

Mr **Andries van der Merwe**, the Project Director, is appropriately qualified and registered with the relevant professional bodies. Mr van der Merwe is a professionally registered Environmental Engineer registered with the Engineering Council of South Africa (Pr. Eng.) and holds a B. Eng. (Civil) degree. Mr van der Merwe has over 14 years' experience in the field of impact assessment.

Miss **Franci Gresse**, the Project Leader, is a Senior Environmental Practitioner at Aurecon's Cape Town office with eight years' experience in the field. Miss Gresse has a Bachelor of Science (Honours) degree in Conservation Ecology and has been involved in a number of energy related projects in the Western and Northern Cape provinces.

Mr **Dirk Pretorius**, one of the project staff, is a Senior Environmental Practitioner at Aurecon's Cape Town office with six years' experience in the field. Mr Pretorius is register as a Professional Natural Scientist at the Natural Scientific Professions Act, 2003 (Act 27 of 2003) and has a Bachelor of Science (Honours) degree in Conservation Ecology. He has been involved in a number of energy related projects in the Western, Eastern and Northern Cape provinces of South Africa as well as East Africa.

2 SITE SELECTION PROCESS

The purpose of this chapter is to document and describe the process and rationale by which the proposed sites were identified and selected. It describes the regional boundaries within which the sites were identified and the criteria used to identify potential sites.

2.1 Background

As outlined in section 1.1 of Chapter 1, the need to develop additional disposal facilities for ash produced by Kriel Power Station, has resulted in Eskom initiating an EIA process in 2009 for the development of a new Ash Disposal Facility that would have sufficient capacity for the remaining operational life of the power station until 2039 plus a five year contingency. While the initial focus, from a logistical/ operational perspective, was on an area identified by Jones and Wagener Consulting Engineers J&W)[6] in 2006 to the immediate south of the Kriel Power Station and the existing ash dams, it was recognised that the EIA process requires the applicant to consider all reasonable and feasible alternatives thoroughly. As part of the EIA process, the Aurecon EIA team, assisted by Eskom and J&W, undertook the identification of potential sites within a 12 km radius (see Section 2.2 for more detail) of the Kriel Power Station in 2009 and 2010, in order to ensure that the EIA process could commence from a robust and defendable starting point.

The process of identifying potential sites within the 12 km radius included a site visit to the Kriel Power Station, various discussions with relevant Eskom personnel, as well as a number of internal project team meetings and workshops. The Department of Water Affairs' (now DWS) guideline on minimum requirements for waste disposal for landfill sites (2nd edition, 1998) was also taken into consideration during the screening process. The criteria discussed in the aforementioned document was used to identify potential environmental impacts and to inform specialist investigations. This criteria included: potential to pollute surface and ground water resources, stability issues, sensitive environmental features, landscape characteristics, surrounding land use, air quality, distance of site from waste source and visual aesthetics.

Based on the outcome of this site selection process, J&W was appointed to undertake an extensive geotechnical investigation during 2010/11 (report JW196/11/C779) for Site 10 (i.e. the area immediately south and adjacent to the existing ash dams).

Figure 2-1 below provides a visual illustration of the process that was followed since 2006 to identify a potential site(s). For more detail on the site selection process that was followed in 2009/2010, please refer to Annexure C. Note that the sections below will be focusing on the latest available information and how this affects the outcome of the original site selection process. Process.

[6] Kriel Power Station Ash Dam Feasibility Investigation, September 2006. Report No: JW127/06/A407

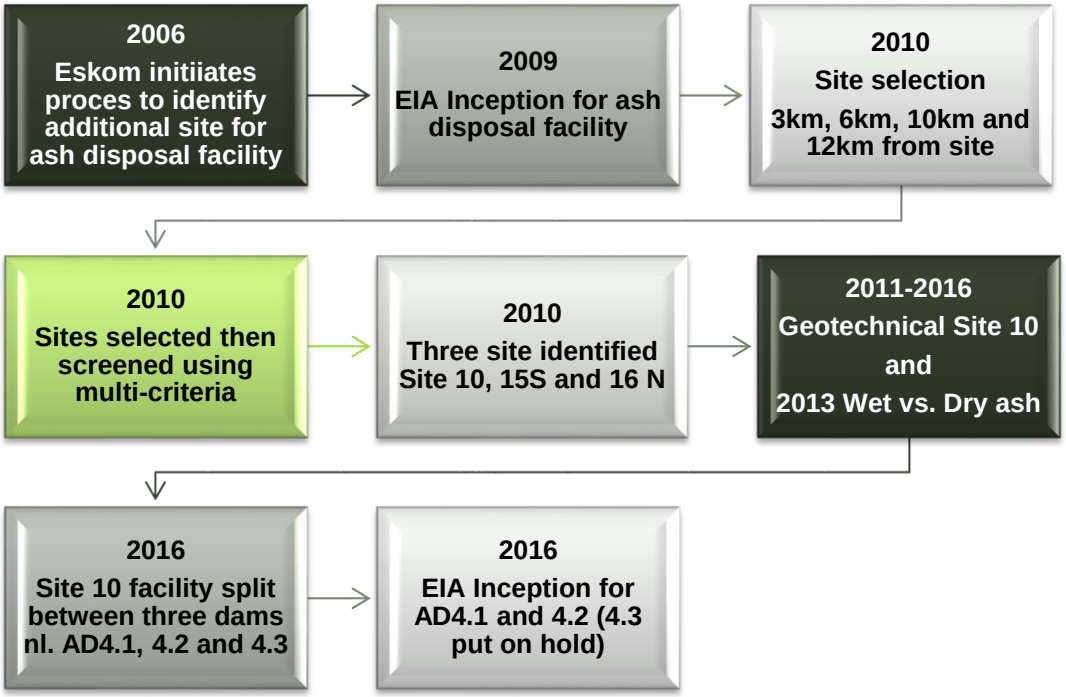


Figure 2-1 | Summary of site selection process followed from 2006 to 2016

2.2 2016 Site selection process and way forward

As mentioned above, J&W was appointed to undertake an extensive geotechnical investigation during 2010/11 (report JW196/11/C779). The report focused on establishing the founding conditions of Site 10 (i.e. the preferred site based on distance from the plant) and evaluating the depth of the backfilled pit. The report furthermore recommended a large scale Monitoring Trial Embankment (MTE) be constructed to calibrate the geotechnical design parameters derived from the investigation. The purpose of the MTE would be to verify, by direct measurement, whether the new ash dam can be successfully constructed with the incorporation of a liner, as required by the authorities, over the backfilled pit. It was concluded that the trial embankment to investigate pit backfill settlement will only be needed for Ash dam 4.3 (AD4.3) of the new proposed ash dam[7].

Further to the geotechnical investigation during 2010/2011other investigations done for Kriel Power Station relating to the feasibility of Site 10 (i.e. these reports all informed the 2016 Kriel Power Station Ash Dam 4 – Site 10 Concept Design Update Report No.: JW044/16/E821) includes:

- 2006: Initial Concept Study – J&W Report no. JW127/06/A407;
- 2010: Site Selection Inputs – J&W Report no. JW71/10/A407;
- 2011: Geotechnical Site Investigation – J&W Report no. JW196/11/C779;
- 2013: Concept Study (Wet vs. Dry) – J&W Report no. JW164/13/D379;
- 2014: Step-In and Go Higher Geotechnical Investigation and Stability Assessment – Preliminary Report – J&W Report no. JW129/15/F015.

After taking the above listed information into account together with recent changes to the landscape and biodiversity, it was determined that the following three criteria needs to be reconsidered as discussed in the sections below:

- Locality of coal resources and undermined areas;
- Geotechnical considerations; and
- Sensitive biodiversity features.

[7] The MTE and AD4.3 does not form part of this EIA and will be investigated at a later stage if deemed necessary.

2.2.1 Locality of coal resources and undermined areas

In addition to the locality of coal resources and undermined areas identified in the 2010 site selection process the Kriel Lifex projects (see Figure 2-2) were also investigated for future mining. The Lifex projects included Block F (underground) and Pits 11 and 13 (opencast) and associated mini-pits which have been investigated and authorised for future mining (SRK, 2014) (DEA reference number: 14/12/16/3/3/1/987). These mining properties include:

- Vlaklaagte 83 IS;
- Bakenlaagte 84 IS;
- Driefontein 69 IS;
- Driefontein 69 IS; and
- Kriel Power Station 65 IS.

The latest update on the Lifex projects is that they have been placed on hold indefinitely. This however does not affect the preferred Site 10 alternative which is a depleted open cast mine or Site 16, which is proposed to be located just north east of the proposed Pit 11.

Although it was concluded by Eskom that the relocation of primary infrastructure was not a fatal flaw to locating an Ash Disposal Facility (unlike the sterilisation of coal reserves), Site 10 provided an opportunity to both avoid relocation of primary infrastructure as well as sterilisation of coal reserves. Furthermore, at Site 10 the possibility of retaining the existing delivery and return infrastructure system with expansions as required would result in significant cost savings.

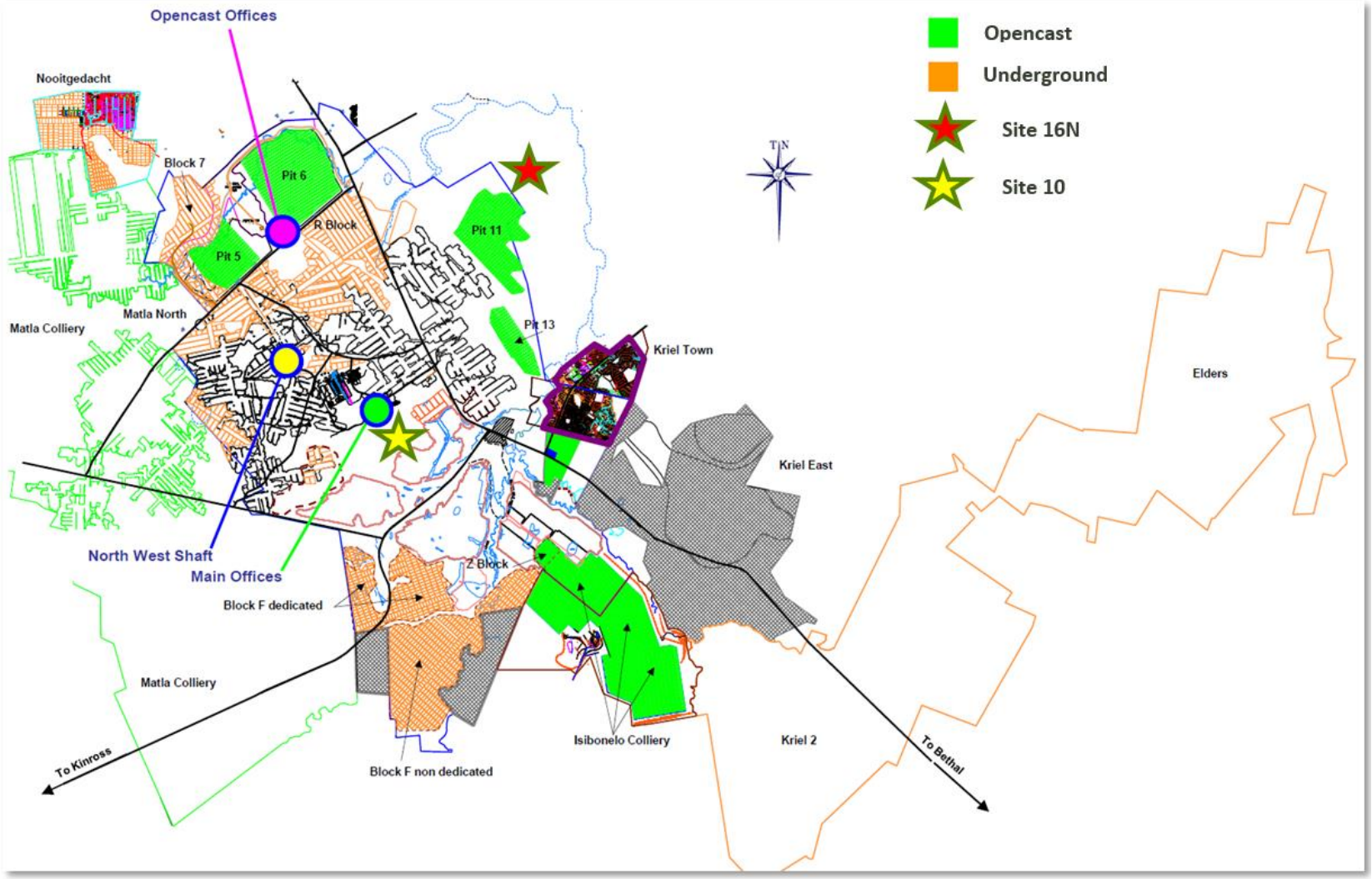


Figure 2-2 | Map indicating the mining activities around Kriel[8]

[8] Source: www.sacollierymanagers.org.za/docs/MAP%20to%20Kriel%20operations.pdf

2.2.2 Geotechnical considerations

An extensive geotechnical investigation was undertaken by J&W during 2010/11, resulting in report (No.: JW196/11/C779), issued in May 2012. The Site 10 area that was subject to the geotechnical investigations consists of the No. 4 Seam, mined in Pit 1 and Kriel Pit 1 (Block 4). The general methods of working, opencast mining operations tend to leave areas where there may be relatively loose fill materials of considerable thickness, which can undergo significant settlement. This is exacerbated by the fact that the backfill is normally of a heterogeneous nature, composed of a wide range of materials including silty sandy & clayey soils, fragments of sandstone, siltstone, mudstone, shale and coal debris. To complicate the situation further, there is considerable variation in the dimensions of the contained fragments, from clay-sized up to several meters across. Replacement of these spoils in the excavation, even with controlled compaction, produces the potential for large differential settlement. A benefit of dragline operations is the well-mixed nature of the cast spoils. End-tipping operations typically result in segregation as the larger particles roll to the toe of the heap. As a result of the nature of the methods of operation and because of the double handling and weathering effects between initial excavation and final rehabilitation, the siltstone/mudstone/shale components in the spoils backfill can break down and behave as a cohesive material. The harder sandstone components are more durable and remain as cohesion less gravel and boulder inclusions. Therefore the 2016 Kriel Power Station Ash Dam 4 Report (No.: JW044/16/E821) indicated that based on geotechnical stability the Site 10, Dams 4.1 and 4.2 would meet geotechnical requirements. Only dam 4.3 would need the MTE construction to indicate the technical viability of this option (see Figure 3-5).

2.2.3 Sensitive biodiversity features

The MBCP (Ferrar& Lötter, 2007) has been updated with the 2014 Mpumalanga Biodiversity Sector Plan (Lötter, Cadman, & Lechmere-Oertel, 2014). The change in planning for the area does however not change the land use viability for Site 10 or 16N (see Figure 2-3 and Figure 2-4). It was however determined that the vegetation types[9] identified for both sites are no longer considered to be Endangered and have been rated as Vulnerable in terms of Government Notice 1002 of 9 December 2012 of the National Environmental Management Biodiversity Act (Act 10 of 2004). For more information on the potential impact on the biophysical environment due to this development, please refer to Chapter 6.

[9] Eastern Highveld Grassland (Gm 12) and Soweto Highveld Grassland (Gm8)

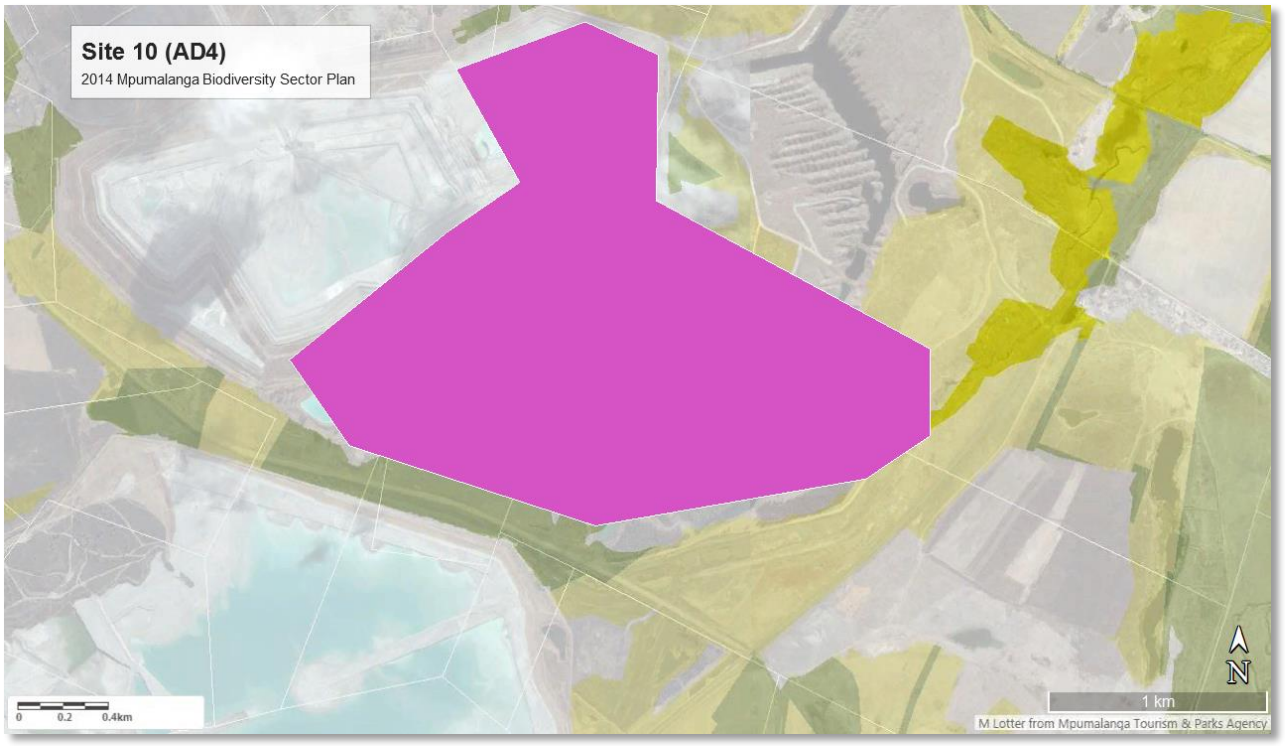


Figure 2-3 | Sensitive land units identified by the 2014 Mpumalanga Biodiversity Sector Planat the Site 10

Figure 2-4 | Sensitive land units identified by the 2014 Mpumalanga Biodiversity Sector Planat site 16N

2.2.4 Ranking of potential sites identified

Taking into account the new information that has become available since 2010, it is necessary to re-evaluate the rankings of the three sites that were initially identified in 2010 as depicted in Table 2-1 and Table 2-2 below.

Table 2-1 | Weightingsof 2016 site alternatives

Site	Design/ operating requirements	Cost[10]	Geotechnical stability	Groundwater pollution	Other sensitive environmental features (e.g. Critical Areas, arable land)
10	2	3	2	2	3
15S	2	3	1	1	2
16N	1	1	3	3	1

The results of the 2016 site ranking process for the three identified sites are presented in Table 2-2.

Table 2-2 | Site ranking matrix

Site	Design/ operating requirements	Cost	Geotechnical stability	Groundwater pollution	Other sensitive environmental features (e.g. Critical Areas, arable land)	Total
Weighting	20	15	25	25	15	100
10	13.3	15	16.7	16.7	15	76.7
15S	13.3	15	8.3	8.3	10	54.9
16N	6.7	5	25	25	5	66.7

Based on the above it is apparent that Site 15S is least favoured with regards to groundwater and geotechnical characteristics. In addition, Site 15S has been indicated as the least favourable option mainly due to the fact that the site has been rehabilitated and includes a wetland area. Furthermore, both Site 15S and 16N are located further away from the Power Station than Site 10 and would thus have a higher visual impact on the surrounding landscape.

With regards to Site 16N, it was considered to be “more favourable” than Site 10 during the 2010 site screening exercise in terms of geotechnical stability and groundwater pollution risks, yet as explained in the above section this is no longer the case. It is also considered to be “least favourable” in terms of design / operating requirements (reasons described in Section Annexure C), cost and sensitive environmental features as it would extend the environmental disturbance footprint of the power station and its associated infrastructure into Greenfields.

The additional geotechnical studies undertaken for Site 10, did however show that a fourth ash dam next to the existing Ash Disposal Facility is a feasible option despite the initial concerns in 2010 regarding potential subsidence. This site would limit the impact of the proposed expansion on the environment and would also be more cost effective compared to Sites 15S and 16N.

2.3 Conclusion

To conclude this Chapter it was initially proposed in 2010 to take Sites 10 and 16N forward into the EIA Report stage for detailed assessment. However, since further geotechnical studies have been undertaken by J&W (2016) it has become apparent that Site 10 (AD 4.1 and AD4.2) is technically feasible for the proposed development and therefore only Site 10 will be taken forward for detailed assessment in the EIA phase.

[10]Excludes rehabilitation (including water treatment facility), mitigation and maintenance costs. These would be required for the approved site.

3 THE PROPOSED DEVELOPMENT

This chapter considers the need for the proposed project, briefly outlines the nature of the proposed activities and then considers and screens the various project alternatives in order to focus the EIA Phase on the most feasible alternatives.

3.1 The need for the proposed activity

Kriel Power Station ash dam complex consists of three ash dams of different sizes (Table 3-1). All three ash dams are located adjacent to each other with Ash Dam 1 on the western border, Ash Dam 2 in the middle and Ash Dam 3 located at the eastern end of the ash dam complex (Figure 1-2).

Table 3-1 | Capacity details of the three ash dams

Dam	Footprint (ha)	Upper Surface Area (ha)	Maximum Height (m) (J&W, 2016)	Maximum Elevation (above MAMSL) (J&W, 2016)
1	44.4	16.38	90	1675
2	129.77	70.73	90	1675
3	73.7	50.78	72	1651

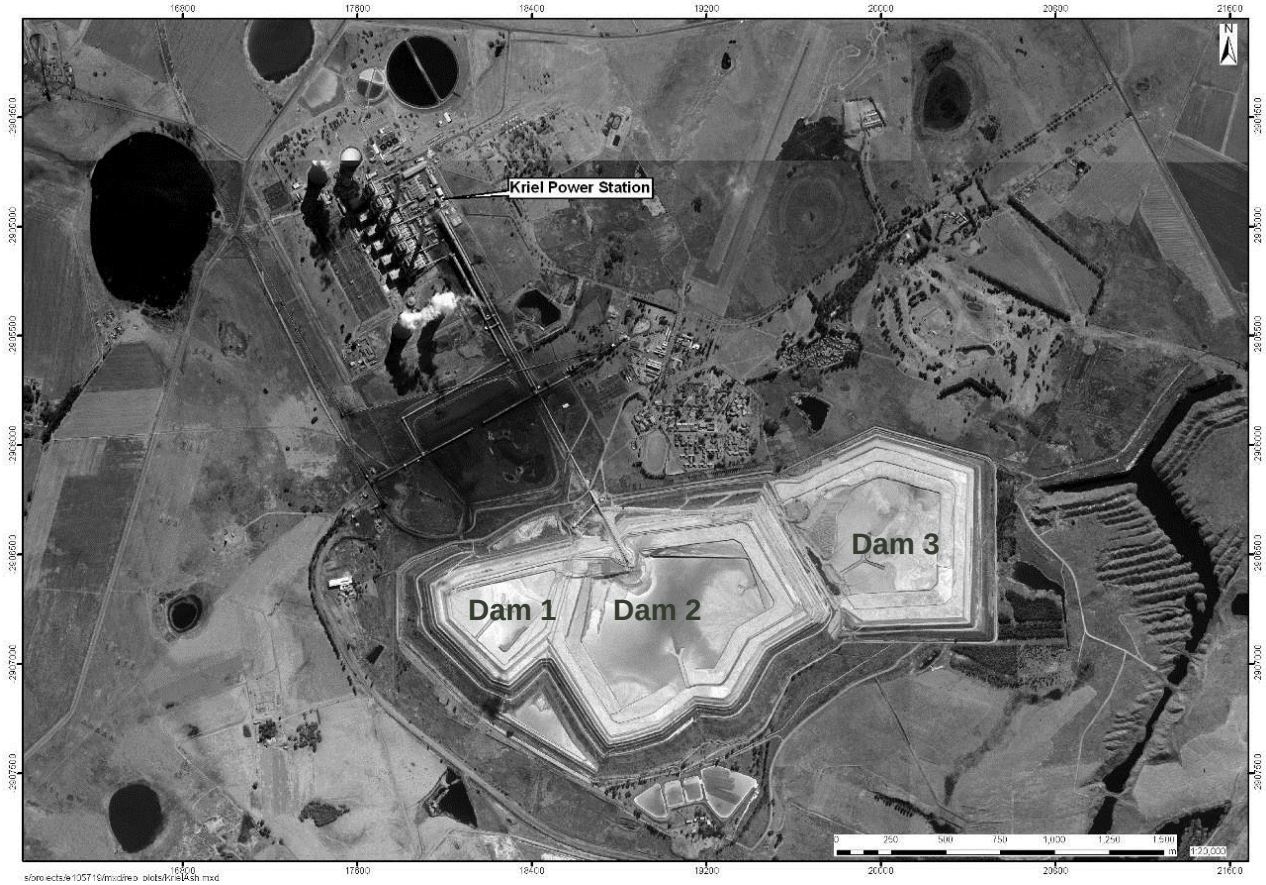


Figure 3-1 | Location of the Kriel Power Station and current ash dam complex

The ash dams are constructed through the "day wall" method. This method makes use of fly ash to construct a wall during the day that is used to impound coarse ash and a mixture of coarse ash and fly ash during the night. Each dam is equipped with gravity penstocks to remove supernatant[11] water. Decant and drain water is diverted to three return water dams from where it is pumped to the power station for re-use. Seepage and surface water runoff is also collected *via* stormwater canals at the perimeter of the ash dams which feeds into the return water dams. This water is then re-used by the power station to transport ash to the ash dams, thereby limiting their need for "raw" water uptake.

Based on the design ash load the existing Ash Disposal Facility will reach its capacity around 2025 (maximum height), but this could be extended to 2045 if ash loads are lowered and new a new Ash Disposal Facility is built. Eskom thus proposes to construct an additional Ash Disposal Facility that would fulfil ash disposal requirements for the remainder of the power station's operational life, i.e. until 2039 plus a five year contingency. During this period approximately 71.5Mtonsof ash will be produced (see Table 3-2).

Table 3-2 | New Kriel Ash Disposal Facility Design Ash Production

Description	Amount	Unit
Maximum Power Station Ash Production	3 700 000	tonnes/year
No. of Units	6	Unit
Maximum Unit Ash Production	616 667	tonnes/year/unit
Fly Ash (80%)	2 960 000	tonnes/year
BBA (20%)	740 000	tonnes/year
Fly Ash Sold	329 000	tonnes/year
BBA Sold (uncertain)	0	tonnes/year

3.1.1 Need and desirability

The consideration of "need and desirability" in EIA decision-making requires the consideration of the strategic context of the development proposal along with the broader societal needs and the public interest. The government decision-makers, together with the environmental assessment practitioners and planners, are therefore accountable to the public and must serve their social, economic and ecological needs equitably. This requires a long-term approach to decision-making in order to ensure that limits are not exceeded and that the proposed actions of individuals are measured against the long-term public interest. Sustainable development therefore calls for the simultaneous achievement of the triple bottom-line.

While the concept of need and desirability relates to the type of development being proposed, essentially, the concept of need and desirability can be explained in terms of the general meaning of its two components in which need refers to time and desirability to place – i.e. is this the right time and is it the right place for locating the type of land-use/activity being proposed? Need and desirability can be equated to wise use of land – i.e. the question of what is the most sustainable use of land.

Specific need and desirability questions raised by the need and desirability guideline are addressed Table 3-3 and Table 3-4 below.

[11] Definition: Clear water that lies above a sediment or precipitate.

Table 3-3 | Summary of needs

NEED (TIMING) Question	Response
1. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority i.e. is the proposed development in line with the projects and programmes identified as priorities within the Integrated Development Plan (IDP)?	The area proposed for the Ash Disposal Facility (Site 10) is currently zoned for agriculture, with underground and opencast coalmines surrounding the proposed site. The proposed development is an expansion of existing infrastructure to an area which is essentially limited to the type of use because of the adjacent infrastructure to the north, backfilled mine cuts to the east and south and access road to the facility on the west (the adjacent Matla Ash Disposal Facility is also situated immediately adjacent the access road to the west). The Emalahleni Spatial Development Framework (SDF) of 2015 recognises that the southern parts of the Emalahleni Municipality form part of the region referred to as the Energy Mecca of South Africa, due to its rich deposits of coal reserves and power stations. It furthermore identifies the rich coal deposits, coal mines and power stations throughout the southern extents of the municipal area as the most dominant structuring elements having a major influence on settlement development and expansion trends. It's important to note the strategic level importance of the Ash Disposal Facility at Kriel Power Station as it forms a pivotal part of the facilities functioning. No Ash Disposal Facility means no coal fired power station, which means no efficient energy supply and no employment for the current staff at Kriel. Leading on to this the Emalahleni SDF (2015) recognises that one of its strengths is the rich coal reserves, creating major economic development opportunities in the mining and electricity sectors. Strategic Objective 4 of the Emalahleni SDF (2015) is to build a diverse, efficient and resilient local economy and to optimise the spatial distribution of conflicting economic sectors, specifically highlighting the conflicting demand between mining, energy and agriculture industries. This demand will be further assessed in the EIR. One of the strategic objectives highlighted by the Emalahleni Draft Integrated Development Plan (2015/16) (IDP) is to ensure efficient infrastructure and energy supply that will contribute to the improvement of quality of life for all citizens within Emalahleni. More specifically the Emalahleni IDP (2015) indicates the history of the Kriel, which was established by Eskom in 1973 as a residential area for the workers at the Kriel Power Station, which was constructed in 1975 to 1979. The town experienced rapid growth during 1982 to 1989 and was declared as a municipality in 1990. Accordingly most of the residents in Kriel and Thubelihle are employed at the power stations and the mines in the area underpinning the importance to sustain economic viability of these towns.
2. Should development, or if applicable, expansion of the town/ area concerned in terms of this land use (associated with the activity being applied for) occur at this point in time?	Yes, If the Ash Disposal Facility is not constructed the nock-on on effect will be significant, the activity is in line with the Emalahleni Municipality Vision and Mission statement, which is focussed on efficient service delivery, participative planning, and creating a climate conducive to social development and economic growth. It also recognises the need for an economy that will create more jobs. The expansion of the Ash Disposal Facility will ensure that economic growth is continuous, as electricity is the main driver of economic growth (this development will not necessary create direct jobs but will ensure that jobs created will be maintained until closure of the facility or end of life for the facility). No Ash Disposal Facility means no coal fired power station which means significant job losses. According to J&W studies construction of the first phase of the new Ash Disposal Facilities need to be complete by 2021 to ensure sufficient ash disposal capacity. As pointed out in the answer to question one above, the proposed development is an expansion of existing infrastructure to an area which is essentially limited to the type of use because of the adjacent infrastructure and therefore best practical use of the area.

NEED (TIMING) **Question**	**Response**
3. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? This refers to the strategic as well as local level (e.g. development is a National priority, but within a specific local context it could be inappropriate).	Yes. The Emalahleni (which means the "place of coal") Municipality has a total population of about 495 000 of which a large percentage is either directly or indirectly dependent on the electricity generation industry. Kriel was established by Eskom in 1973 as a residential area for the workers at the Kriel Power Station, which was constructed in 1975 to 1979. Still today most of the working residents in Kriel and Thubelihle (7.2% of the municipality's population) are employed at the power stations and the mines in the area. The local community thus is in direct need of the activity. The Ash Disposal Facility as key infrastructure for the Kriel Power Station is of National priority as it form part of the Department of Energy's Strategic Plan 2015-2020 in that it makes up part of electricity derived from coal. The proposed Ash Disposal Facility is thus important to society from the most localised level i.e. the staff at Kriel Power Station and their dependents to the most extensive level of community in South Africa as electricity generated at Kriel Power Station feeds in to the national grid. It should be noted that the merits of coal fired power as energy source is not considered here as the application is for an Ash Disposal Facility. Furthermore, it's noted that it is a societal priority that cleaner technologies that will reduce the adverse environmental impact associated with greenhouse gas (GHG) emissions be adopted. According to the Emalahleni IDP (2015) the Green energy can be considered a priority to reduce the environmental impact of coal generated energy in and around Emalahleni.
4. Are the necessary services with appropriate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?	No additional capacity from the municipality will be required.
5. Is this development provided for in the infrastructure planning of the municipality, and if not, what will the implication be on the infrastructure planning of the municipality (priority and placements of services)?	The proposed Ash Disposal Facility is not specifically provide for in the infrastructure planning of the municipality. The expansion of the Ash Disposal Facility will have little bearing on the infrastructure planning of the municipality and will be situated on land owned by Eskom.
6. Is this project part of a national programme to address an issue of national concern or importance?	Yes. The establishment of the proposed Ash Disposal Facility would maintain Eskom's mandate to ensure efficient supply of electricity to service the South African economy and society. In 2015 South Africa again (after the power crisis of early 2008) experienced serious energy constraints which are a barrier to economic growth and is a major inconvenience to everyone in the country. According to South Africa's Integrated Resource Plan for Electricity (IRP) 2010-2030 (Update Report 2013) there are several options to potentially extend the economic life of the existing Eskom coal fleet which includes upgrading and expanding of infrastructure.
7. How will this development and its separate elements/aspects) impact on the ecological integrity of the area?	The proposed Ash Disposal Facility is located on land zoned as agricultural and of which a large portion was previously used for mining activities. The land is currently used for agriculture with un arable areas separating the cultivated lands and other features on the proposed development property i.e. the current Ash Disposal Facility and backfilled pits of the Kriel Colliery. Because it's a brownfield site and due to the disturbed nature of the areas investigated, the likelihood of impact on the ecological integrity of the area very low. The Ash Disposal Facility also utilises special liners to ensure that fluids from the facility do not permeate into the groundwater systems which might impact the ecological integrity of the greater area. This aspect of ecological integrity will be further explored during the EIA phase.

NEED (TIMING) **Question**	**Response**
8. How were the following integrity considerations taken into account? 8.1 Threatened ecosystems 8.2 Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) 8.3 Environmental Management Framework 8.4 Spatial Development Framework (SDF).	According to the Emalahleni SDF of (2015) generally, Emalahleni has a few threatened fauna and flora species, with only five Red Data species having been recorded in the municipal area. The only conservation area in the Emalahleni Municipality is the Witbank Nature Reserve, which was originally established as a recreation resort around the Witbank Dam. The proposed Ash Disposal Facility is located on land zoned as agricultural the area was also used previously for mining activities and is currently partly under cultivation. The majority of the area surrounding the power station (including the proposed development Site 10) does not fall within a CBA or ESA (MBSP 2014). The Environmental Management Framework for the Olifants and Letaba Rivers Catchment Area (EMF) highlights policies and aligns different governmental mandates in a way that will streamline decision-making to improve cooperative governance and guide future developments in an environmentally responsible manner. The specific objectives of the EMF include encouraging sustainable development. The existing environmental management priorities will not be compromised, an EIA process will be undertaken for the construction of the proposed Ash Disposal Facility. The environmental impacts and their proposed mitigation measures will be provided in the Environmental Management Plan (EMP) at the end of the EIA phase. The Emalahleni SDF of 2015 indicates that the area is used for agriculture and does not specifically earmark the proposed development Site 10 for any specific future use.
9. How will this development pollute/ degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The alternatives to waste management and incorporation of the waste hierarchy i.e. measures to avoid (prevention) waste and where impacts could not be avoided what measures to minimise (reduce) is discussed in section 3.1.2. The most feasible alternatives came down to reuse of water and recycling ash through selling it to available markets.
10. Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)	The proposed development of the Ash Disposal Facility will ensure that electricity supply is maintained, this will also impact on the economic growth, as electricity is the main driver of economic growth. The proposed development will increase the dependency on natural resources because it makes use of a non-renewable resource. This is an existing Ash Disposal Facility thus the need to build new facilities is abated by prolonging the life of this one. As discussed in section 3.1.2 Eskom is making efforts to reduce the amount of ash that goes to the facility by selling of ash, but due to the large quantities of ash produced and limited active markets the most feasible solution to dispose of the ash to land.
11. Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	The proposed development of the Ash Disposal Facility will ensure that current employment is kept which translates in to stable household incomes within the local area. It's vital to look at the proposed expansion from the perspective of what will happened if it is not constructed in which case we will see significant socio-economic impacts of not only the local area in terms of job losses and issue sprouting from reduced employment, but also at national level where it would mean reduced electricity production proliferation Eskom and South Africa's electricity delivery woes.
12. Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	Considering that the Kriel Power Station is responsible for a large percentage of the local employment it suffices to say that it is the largest socio-economic driver in the immediate area, including the town of Kriel and Thubelihle. The Emalahleni LED (2011-2016) strategy aims to create an industrial hub of the Mpumalanga Province by 2016 through sustainable, efficient and effective economic growth, development and empowerment of the community forms part of. The Emalahleni LED strategy also aims to grow the economy of Emalahleni by 4% per annum through targeted sectors and ensure sustainable growth and development within the 2011-2016 period by creating employment opportunities in line with new growth path targets; and halve poverty in line with Millennium Development Goals. Furthermore, it aims to address all economic infrastructure and basic service delivery backlogs and new requirements within five years, for quality living standards for all. The proposed development of the Ash Disposal Facility will sustain job opportunities and contribute to economic growth which is aligned to the LED strategy.
13. What measures were taken to ensure the participation of all interested and affected parties (I&APs)?	The Public Participation Process (PPP) will be undertaken in terms of NEMA and is described in full in chapter 4.

Table 3-4 | Summary of desirability

DESIRABILITY (PLACING) Question	Response
1. Is the development the best practicable environmental option (BPEO) for this land/ site?	Yes. The property on which the development is proposed is situated is currently used for the activity applied for i.e. the existing Ash Disposal Facility is situated directly adjacent to where the expansion of the facility is prosed. The section of the property proposed for the development is currently being used for agriculture. The proposed development is located relatively close to the Kriel Power Station and therefore requires lower capital costs than an alternative further away. Furthermore, it is a brownfields site with limited future land use (due to the nature of the adjacent activities) and located on Eskom owned land.
2. Would the approval of this application compromise the integrity of the existing approved Municipal IDP and SDF as agreed to by the relevant authorities?	No. The activity is not explicitly planned for in the Emalahleni Municipality SDF or IDP, but it also does not compromise any of the plans described in these strategic documents.
3. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in Environmental Management Framework (EMF)), and if so, can it be justified in terms of sustainability considerations?	No. The proposed development site falls in the area covered by the 2010 Environmental Management Framework for the Olifants and Letaba Rivers Catchment Area. The existing environmental management priorities will not be compromised since the construction at the proposed site will be the best practicable environmental option. This is supported by the fact that the proposed Site 10 is not located on a CBA, ESA, NPEAS or any other priority environmental area.
4. Do location factors favour this land use (associated with the activity applied for) at this place?	Yes. As discussed above (answer to question 1) the land use will be an expansion of an activity that currently takes place on the proposed development property.
5. How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/ natural environment)?	The MBSP (2014) mapped the area surrounding the proposed development site as heavily modified, moderately modified (old lands) and other natural areas. The proposed development site and surrounding area has been disturbed through agriculture, the power industry and mining operations. The proposed activities is typical of the area and people in the area will be accustom to seeing similar activities, especially because the proposed expansion is adjacent the existing Ash Disposal Facility. Site 10 is adjacent to the existing Kriel Ash Disposal Facility and as such could limit the visual footprint of the proposed ash facility at this site. Since potential heritage material is buried, it is often only found during the construction phase of a project, due to the historical disturbances at the sites (construction of the power station, rehabilitated opencast mine, ash dam and agricultural practices) it is unlikely that archaeological or cultural material of value would be found on site an thus reducing alterations to the sense of being of the area.
6. How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)?	The area surrounding the Kriel Power Station is located at some 1,600 m above mean sea level and is gently undulating as such, the power station is visible for many kilometres in the surrounding area, the proposed development of the Ash Disposal Facility will alter the visual characteristics of the area but likely not the sense of place seeing that the proposed development is an expansion of an existing activity. The area surrounding the power station includes the Kriel Colliery and Matla Power Station and associated infrastructure including its vast ash dams. The communities in the surrounding area will be familiar with these land uses but may be impacted by the noise generated on the site.
7. Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	No. The proposed facility is an expansion of an existing Ash Disposal Facility therefore it is not anticipated that it will have an unacceptable opportunity cost. It is foreseen that the impacts on agriculture which is the current land use will not be unacceptable.
8. Will the proposed land use result in unacceptable cumulative impacts?	Due to the many other Ash Disposal Facilities in the region the cumulative impacts of these facilities might have a significant bearing at a regional scale. The cumulative impacts will be assessed in the EIA phase.
9. In terms of location, describe how the placement of the proposed development will: 9.1 Result in the creation of residential and employment opportunities in close proximity to or integrated with each other. 9.2 Be in line with the planning for the area 9.3 Encourage environmentally sustainable land development practices and processes.	It is unlikely that any new job opportunities would be created during the operational phase, as employees working currently at the existing Ash Disposal Facility would only move to the new expanded facility. The area proposed is currently zoned for agriculture, but does not oppose any planning in the Emalahleni SDF and IDP. Due to the proposed site being situated adjacent the existing Ash Disposal Facility and the transformed nature of the area (specifically the proposed site) it means that the alternatives that could have a greater negative effect on the environment and land development practices and processes do not have to be developed.

DESIRABILITY (PLACING) Question	**Response**
10. What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	The proposed development makes use of old technology and known energy source which has been used since 1979. The strategic level investigations undertaken by Eskom prior to the commencement of the EIA process are accepted to be technologically acceptable and robust.
11. What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	The potential health and safety impacts have been identified. The proposed Ash Disposal Facility will be managed according to the existing health and safety requirements of the Kriel Power Station. The contract for the construction and operation of the facility will go out on tender following receipt of the requisite regulatory approvals and the selected operator will be required to operate the facility in terms of the Operational plan as well as various conditions of approval. The potential health and safety mitigation measures will be included in the construction and operational EMP, which would be guided by the findings and recommendations of the EIA specialists.
12. How will this development use and/or impact on non-renewable natural resources?	The proposed development of the Ash Disposal Facility will deplete the coal resource for the duration of the development lifecycle until 2045. Once the resource has been depleted the facility will be decommissioned and rehabilitated.
13. How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	Electricity is a basic human need. The proposed development of the Ash Disposal Facility will ensure that electricity supply is maintained, this meets the developmental interests of the relevant communities. The social needs of the relevant communities will be met by provision of jobs and income.
14. What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	Given the need to develop additional disposal facilities for ash produced by the coal-fired Kriel Power Station, Eskom initiated an EIA process for the development of a new Ash Disposal Facility that would have sufficient capacity for the remaining operational life of the power station. For the propose development of the Ash Disposal Facility potential candidate areas within the study area were identified by considering a range of technical, financial and environmental criteria. These included inter alia locality of coal resources and undermined areas, existing infrastructure, groundwater/ hydrological features, geotechnical considerations and sensitive biodiversity features.
15. How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage?	Heritage resources are expected to occur within the vicinity of the potential sites and would need to be assessed *via* a HIA, which aims to locate, identify, evaluate and document sites, objects and structures of cultural significance found within the area of the proposed development and to assess the significance thereof and to consider alternatives and plans for the mitigation of any adverse impacts. The impacts and their proposed mitigation will be provided in the Environmental Management Plan (EMP) at the end of the EIA phase. It should be noted that due to the historical disturbances at the sites (construction of the power station, rehabilitated opencast mine, ash dam and agricultural practices) it is unlikely that archaeological or cultural material of value would be found on site
16. Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	Ecosystem services will be investigated throughout this EIA. The transformed nature of the site and restricted access means that valuable ecosystem services is most likely not of high significance for the site in terms of a local context.
17. Describe how the development will impact on job creation in terms of, amongst other aspects:	The decommissioning of the Kriel Power Station due to insufficient ash disposal capacity would result in the loss of jobs. It is unlikely that any new job opportunities would be created during the operational phase, as employees working currently at the existing Ash Disposal Facility would move to the new facility.
20. Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	The EMP will describe all reasonable and feasible mitigation measures and address long-term environmental management. The decommissioning of the facility will have to be dealt with once the Kriel Power Station has come to its end of life.
21. Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives / targets / considerations of the area?	The facility will function as an end point of the coal life cycle where ash is disposed of in a manner that is prescribed by legislation, directed by findings of this EIA and managed though an EMP specifically for the proposed new Ash Disposal Facility .

3.1.2 Ash Disposal Facility waste management alternatives

When considering viable options for waste management it's pertinent that the waste management hierarchy be implemented in a way that prevents waste disposal as far as possible by reducing, reusing and recycling the potential waste product, see Figure 3-2. The waste hierarchy is a globally accepted guide used to prioritise waste management alternatives and aims to optimise environmental outcomes. The proposed Ash Disposal Facility as the names states comes in at the very bottom of the waste hierarchy i.e. disposal. Below we briefly explore the proposed viability options in terms of the waste hierarchy in context[12] of the proposed facility.

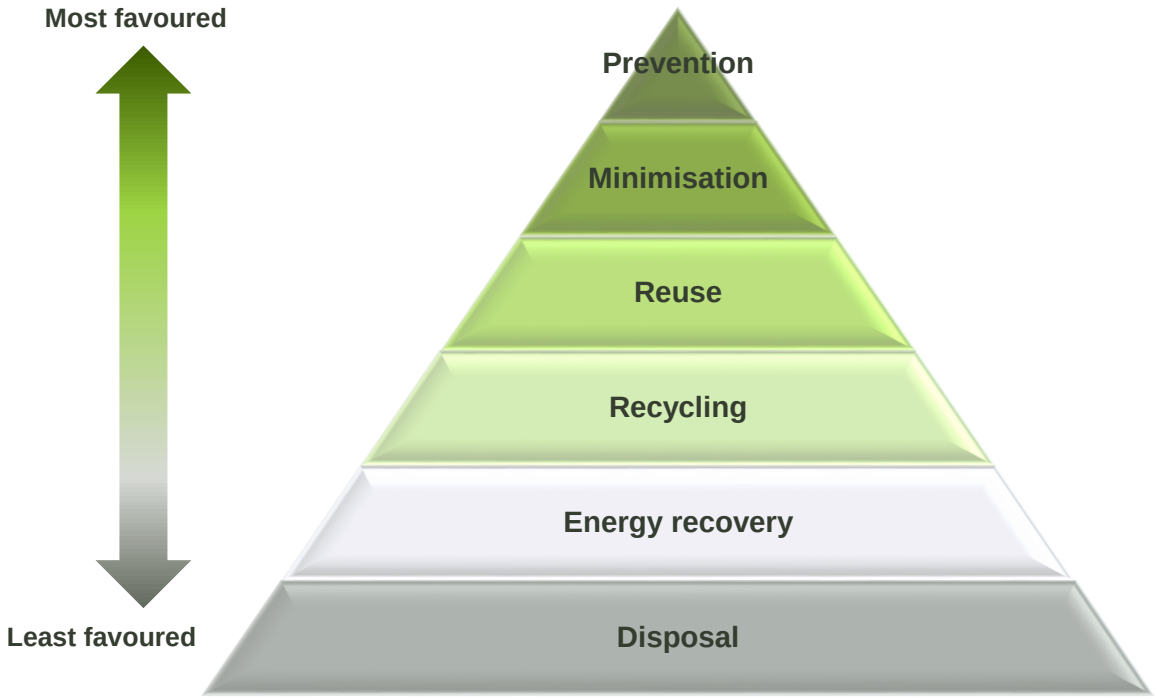


Figure 3-2 | Waste hierarchy

A. Prevention

The most favoured measures in terms of the waste hierarchy relates to **prevention**. Prevention in the context of electricity generation would mean that another technology i.e. renewable energy is used which does not create waste. Consequently prevention is not a viable alternative for the Kriel Power Station seeing that ash is an inherent residual of the coal burning process and therefore this option will not be further explored.

B. Minimisation

The next level of the waste hierarchy refers to **minimisation**. In order to consider the minimisation of ash one has to consider the technology used to burn the ash producing coal and the quality of the coal. Since the technology at Kriel Power Station is dictated by the existing infrastructure this option does not provide room for alterations. When it comes to quality, most of the South African coal has been found to be of low quality with a low heat value and containing a significant amount of inorganic (incombustible) contaminants (see Table 3-5 for mineral contents of Kriel pulverised coal-fired boiler ash), i.e. producing high ash content as a result of coal burning process (Zitholele Consulting, 2016). Most of the inorganic material is not removed prior to burning from the coal and is thus part of

[12] Energy recovery is not discussed because the process of burning coal inherently involves extracting energy which means an effective process would see the optimised extraction of energy leaving no viable energy to be recovered.

the fuel fed to the boiler during the power generation process. The incombustible materials result in the ash volume for disposal. Since the coal quality will not increase and removing the incombustible materials is not a viable option, minimising the ash produced is not currently a viable option. The only scenario where less ash will be produced is if the facility lowers the Generating Load Factor (GLF). The GLF essentially translates to the amount of ash produced as a function of the amount of coal that is burnt, i.e. less coal burnt, the lower the GLF percentage. This will consequently translate to lower amounts of energy generated and is not an option for consideration in this EIA.

Table 3-5| Mineral Contents of Kriel Pulverised Coal-fired boiler ash (Zitholele Consulting, 2016)

Constituents	SiO2	AL2O3	FE2O3	TiO2	P2O5	CaO	MgO	Na2O	K2O	SO3	MnO
Percentage	48.84	26.60	3.23	1.55	0.98	10.54	2.20	0.15	0.72	4.04	0.06

Kriel Power Station and the associated Ash Disposal Facility minimises their use of water through an integrated recycling system. Kriel Power Station uses wet cooling systems which generates a lot of waste water. This waste water is recycled and used for ash slurrying. Once the slurry is deposited in the ash dams the residual water is once again recycled through the return water system (consisting of the AWR and transfer dams) and fed back to the Power Station for use thereby minimising the use of raw water from other sources. The same reuse system is proposed to be used at the expanded Ash Disposal Facility and will be further assessed during the EIR.

C. Reuse and recycling

Coal-fired power stations provide a challenge to the waste hierarchy because of the constituency of the ash created during the burning of coal. Since August 2013 ash had to be classified or re-classified in terms of the NEMWA Waste Classification and Management Regulations (GN R. 634 of 2013) and transitional arrangements were set in place for a period of three years from the date of commencement of these regulations i.e. August 2013.

In April 2016 Eskom lodged a motivation for the application for exemption of waste management activity licences for specific uses of pulverised coal fired boiler ash in terms of GN R. 634 with DEA[13]. This report presented information required in Section 9 of GN R. 634 of 23 August 2013 to acquire exemption from the requirement of waste management licences as it relates to activities for the downstream use of pulverised coal fired boiler ash in brick making, soil amelioration, road construction and mine backfilling.

It's important to consider the recycling of ash at the appropriate geographical scale, which is underpinned by the cumulative contribution of other facilities (coal fired power stations) that also produce ash. Eskom currently operates 14 coal-fired power stations within the Mpumalanga, Free State and Limpopo Provinces, all yielding high ash content as a result of coal burning processes. In the 2015 financial year 34.4 million tons of ash was generated in South Africa of which only about 2.41 million (7%) was sold (Zitholele Consulting, 2016). This is a very low percentage considering international benchmarks such as China utilises more than 65% of their ash (Zitholele Consulting, 2016).

Considering the cumulative volumes of ash produced in South Africa and the legislative framework pertaining to the use of ash it is evident that the recycling of the ash is an issue that must be resolved at a strategic level. Therefore Eskom has started a process to increase the beneficial utilisation of ash produced through the electricity generation process at its coal fired power stations, including Kriel. At this stage Eskom is in the process to motivate to the Minister of Environmental Affairs to exempt specific waste management activities from the requirements of a waste management licence in terms of section 19 of the NEMWA as well as the associated regulations in order to realise beneficial uses such as brick and block making, road construction, mine backfilling, and use in soil amelioration. Nevertheless, a significant portion, about 329 000 tonnes (Jones and Wagner, 2016) of fly ash, is being sold per year by Eskom. Ulula Ash (Pty) Ltd is currently contracted at Kriel Power Station to facilitate the selling of class[14] N and S

[13] Zitholele Consulting (Pty) Ltd, April 2016 Report No : 16005-41-Rep-001-Eskom Ash GN R 634 Application-Rev2
[14] SANS 50450---1:2011 Fly Ash for Concrete (Siliceous Fly Ash)

ash which is used for concrete. This ash is however removed at the plant itself and does not form part of this EIA. This option will not be further assessed as part of the EIA process.

D. Disposal

The Kriel Ash Disposal Facility forms an integral part of the handling, re-use and disposal of water and waste at the Kriel Power Station operations. In case of the ash that is not sold (as discussed in the section above), disposal is currently the most feasible alternative for the Kriel Power Station and thus forms the basis for this EIA application process.

3.2 Description of the proposed project

The Kriel Power Station proposes to expand the existing Ash Disposal Facility to include a fourth Ash Disposal Facility. The Ash Disposal Facility is a final disposal mechanism at the end of the energy generation process as illustrated in Figure 3-3. The project requires the following components:

- An Ash Disposal Facility that would have sufficient capacity for the remaining operational life of the power station until 2039 plus a five year contingency to 2045;
- An AWR dam from where decant and drained water would be pumped back to the power station for re-use;
- An AWR transfer dam;
- Delivery and return infrastructure, including pipelines, transfer houses, pump stations;
- Powerlines;
- Access roads; and
- Clean and dirty water collection channels/trenches.

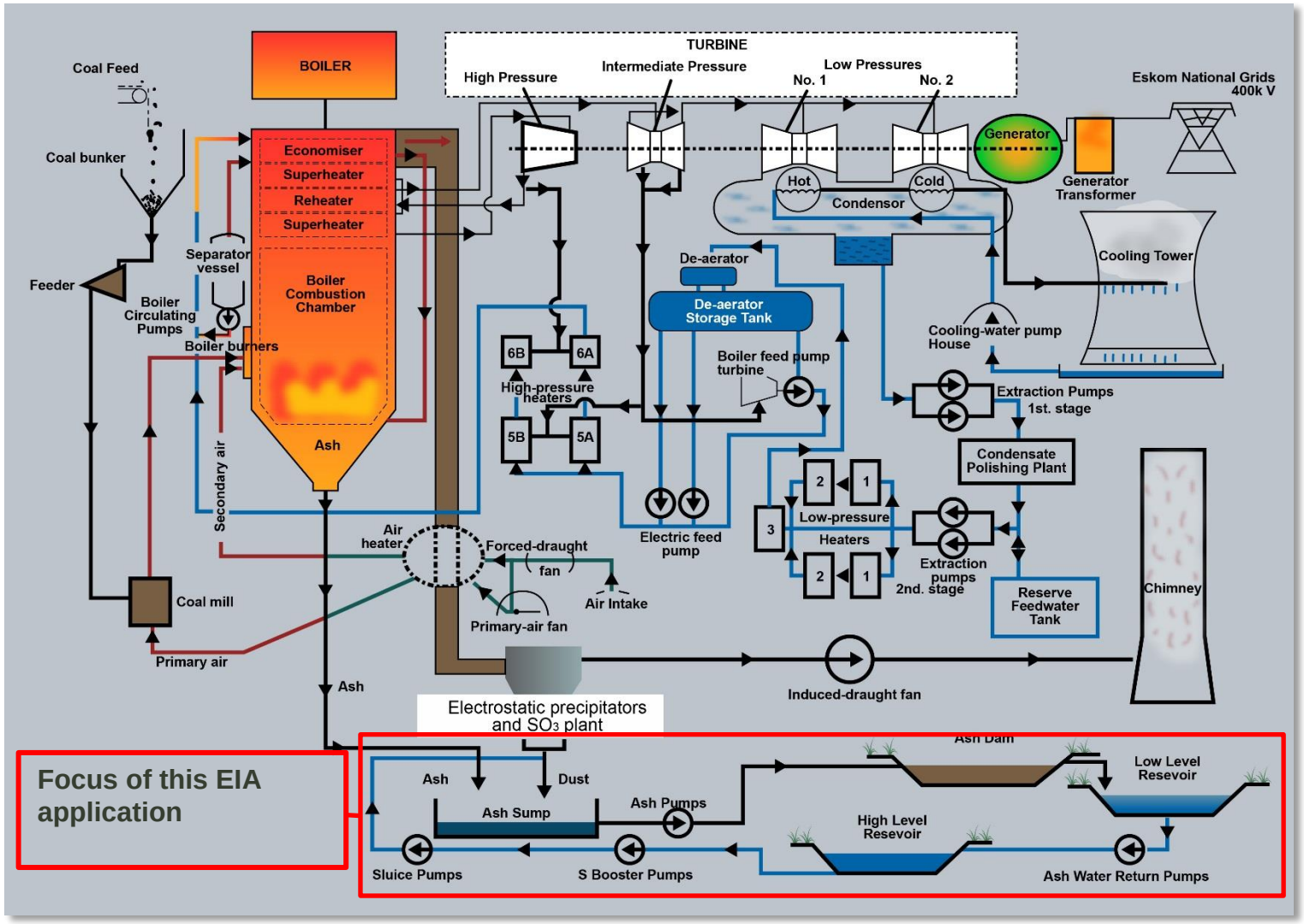


Figure 3-3 | Flow chart of the operation showing inputs and outputs of the process at Kriel Power Station (including the Ash Disposal Facility in red)

3.3 Consideration of alternatives

3.3.1 Introduction

NEMA requires that feasible alternatives are considered during the EIA process. An important function of the Scoping Phase is to screen potential alternatives to derive a list of feasible alternatives that need to be assessed in further detail in the EIA Phase. An alternative is defined as a possible course of action, in place of another, that would meet the same purpose and need (DEAT, 2004). Alternatives could include, amongst others, the following:

- **Location alternatives** - alternative locations for the entire project proposal or for components of the project proposal.
- **Site layout alternatives** - site layout alternatives permit consideration of different spatial configurations of an activity on a particular site.
- **Activity alternatives** - also referred to as project alternatives. Requires a change in the nature of the proposed activity. This category of alternatives is most appropriate at a strategic decision-making level.

The above categories of alternatives are the ones most pertinent to this EIA process, and their relevance is explored in detail below. The purpose of this section of the report is to identify (scope) and describe all potential alternatives and determine which alternatives should be carried through to the EIA Phase of the project for further assessment.

3.3.2 Site location alternatives

Once the need for the proposed Ash Disposal Facility was established, an extensive site screening process was undertaken to identify potential sites within a 12 km radius of the Kriel Power Station (**see Chapter 2 of this document**). Based on this exercise Site 10 (i.e. AD 4.1 and 4.2) was identified as being the most suitable for the proposed Ash Disposal Facility for the following reasons:

- located relatively close to the Kriel Power Station and therefore requires less capital costs;
- located on a brown field site within the disturbance footprint of the existing Ash Disposal Facility ;
- limited visual footprint due to its proximity to the existing Ash Disposal Facility ; and
- Predominantly located on Eskom owned land.

Recommended option:
Based on the above, it is recommended that only Site 10 be assessed in the EIA phase.

3.3.3 Site layout alternatives

Site layout alternatives permit consideration of different spatial configurations of an activity on a particular site. Since Site 10 was proven to be technically feasible, Eskom in conjunction with J&W have been working on concept designs for the proposed new ash dams and other infrastructure. In 2014 the first concept design for Site 10 was undertaken by Jones & Wagener. The boundaries of the Site 10 is defined by the existing Ash Disposal Facility to the north, the Cut 2 void to the south, the property boundary to the east and access road to the west. The Cut 2 void is seen as a boundary, because the cut is deep and the earthworks and liner in this area will be excessively costly. Figure 3-4 illustrates the 2014 concept design which consists of two compartments. What should be noted is that a large portion of compartment (ash dam) one and a small portion of compartment two would overlay the backfilled Pit 1 of Kriel Colliery. The proposal to build over the backfilled area raised concern due to the impact that differential settlement could have on the different design aspects of the proposed ash dams.

In order to address design issues (particularly differential settlement) identified in J&W 2014, the concept design was amended in 2016 to include three ash dams namely, AD4.1, AD4.2 and AD4.3 as shown in Figure 3-5. Importantly it should be noted that AD 4.1 and AD4.2 was designed to avoid the backfilled Pit 1 of Kriel Colliery. Only AD4.3 was proposed to overlay the backfilled area.

Based on extensive geotechnical investigation undertaken by J&W during 2010/11, which focused on establishing the founding conditions of Site 10 it was recommended that a large scale Monitoring Trial Embankment (MTE) be constructed to calibrate the geotechnical design parameters derived from previous investigation. The purpose of the MTE would be to verify, by direct measurement, whether AD4.3 can be successfully constructed with the incorporation of a liner, as required by GN.R.636, over the backfilled pit. Construction of the embankment has however not yet started and therefore information with regard to the expected settlement is not available to be used for the feasibility design (liner requirements and best suited deposition method) of AD4.3. Subsequently the proposed establishment of AD4.3 has been put on hold until it has been technically proven. As a result AD4.3 has been scoped out of this EIA process and only AD4.1 and 4.2 and ancillary infrastructure is applied for as illustrated in Figure 3-4.

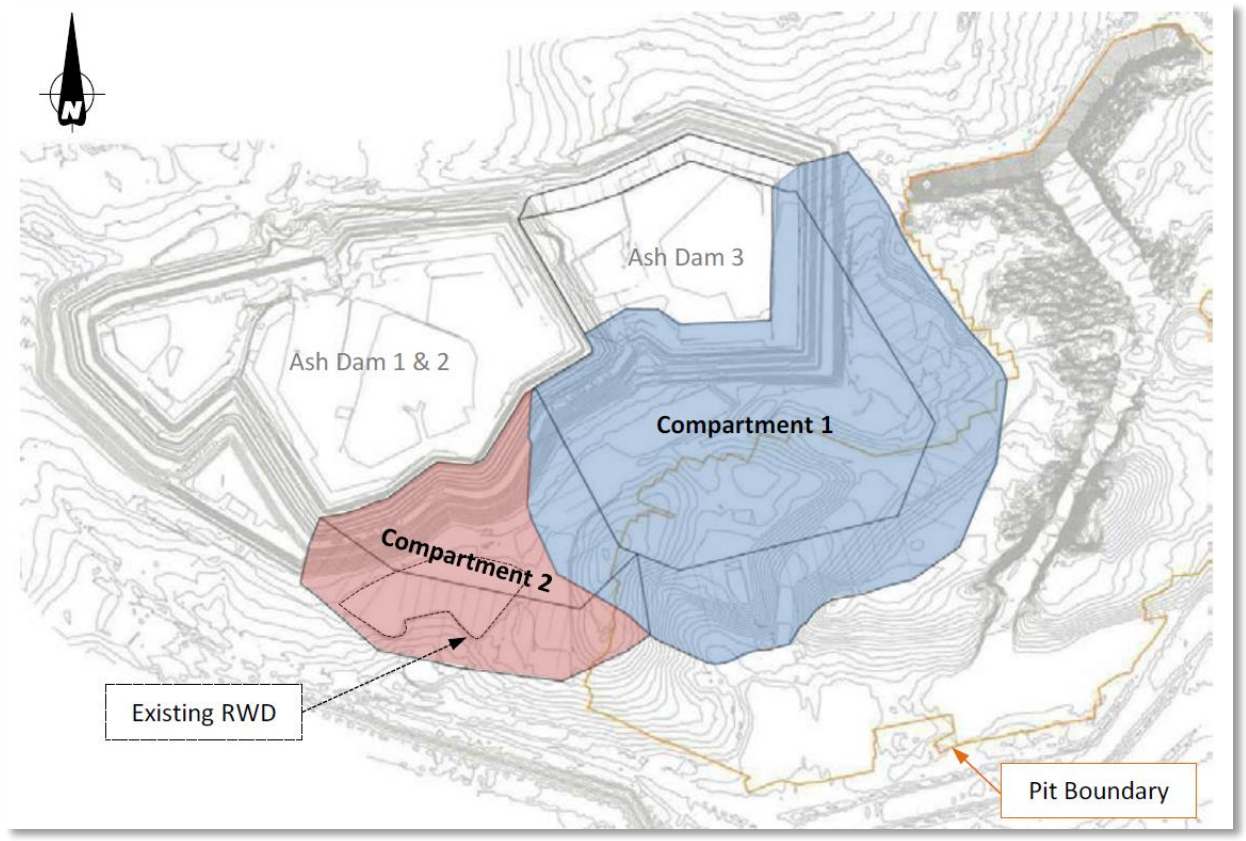


Figure 3-4 | Ash Dam 4 Concept 2014 (Jones & Wagener, 2014)

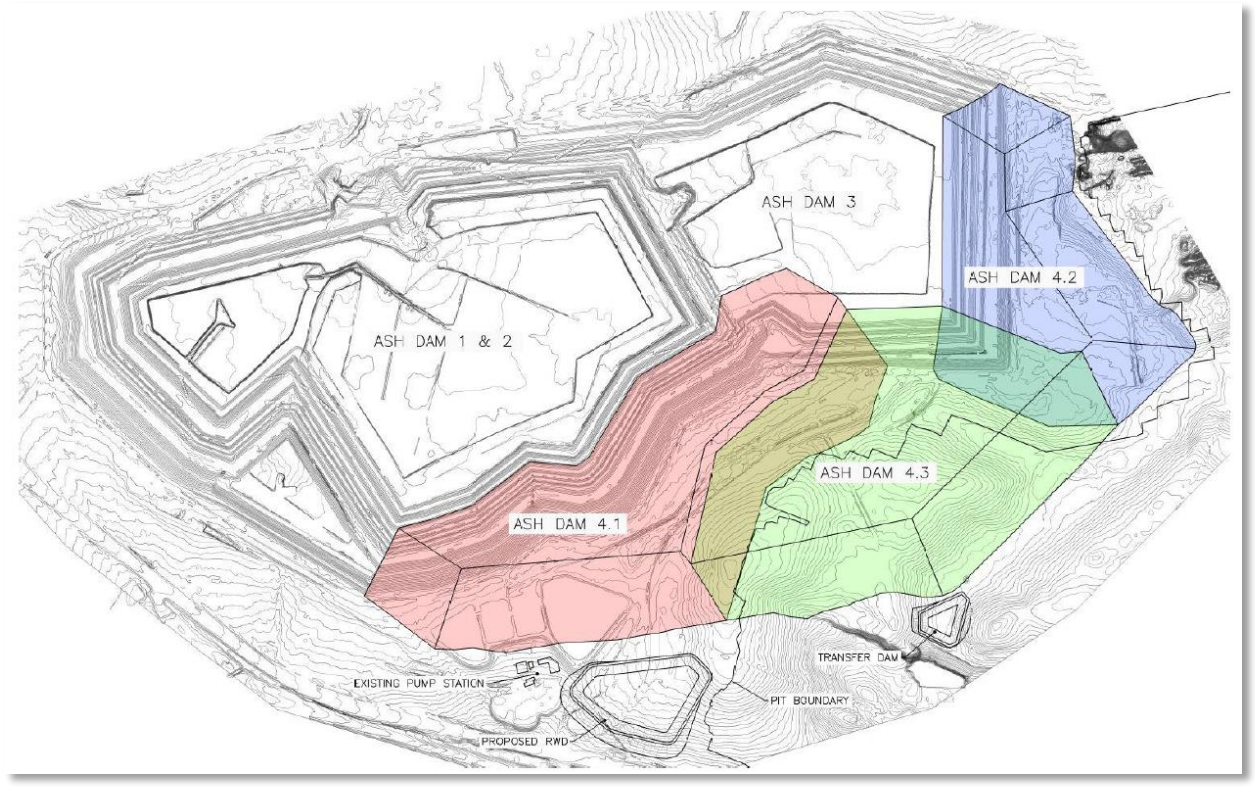


Figure 3-5 | Ash Dam 4 Concept 2016, consisting of three ash dams (Jones & Wagener, 2016)

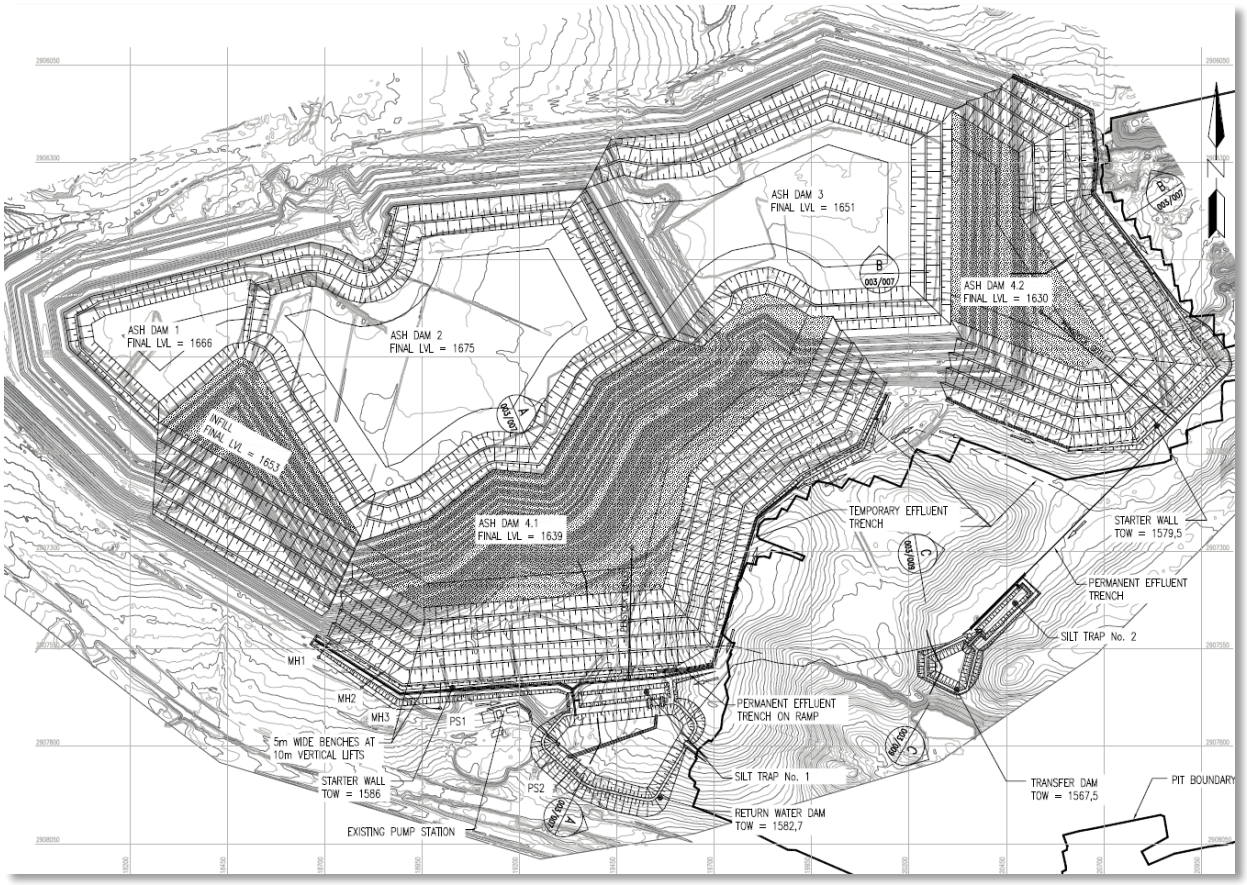


Figure 3-6 | Ash Dam 4 Concept 2016 preferred alternative, consisting of only AD 4.1 and 4.2 (Jones & Wagener, 2016)

The site layout presented in Figure 3-6 will be further developed and assessed during the EIA Phase for the recommended site based on *inter alia* the following criteria:

- Technical constraints
  - Topographical constraints;
  - Spatial orientation requirements of the Ash Disposal Facility and associated infrastructure; and
  - Layout relative to other existing infrastructure, such as power lines and roads.
- Environmental constraints
  - Surface and groundwater pollution;
  - Aquatic and terrestrial constraints (presence of wetlands, rivers, protected plant communities);
  - Dust pollution;
  - Aesthetics; and
  - Community safety and social elements.

The draft layout is presented in Figure 3-6 is attached at a larger scale in Annexure D. It should be noted that because the EIA is only at scoping phase the layout may still change significantly in response to the results from the specialist assessments.

3.3.4 Activity alternatives

Fundamentally different alternatives for achieving the project's objective[15] are normally assessed at a strategic level. In this regard, two options were investigated regarding the method of disposal of ash: 1) wet ashing and 2) dry ash stacking as described below. These ashing technologies each have their own associated transportation infrastructure alternatives and have been comparatively assessed by Jones & Wagener for specifically the Site 10 in 2014 (Report No.: JW164/13/D379 – Rev 0, August 2014). The information given below is a summary from this report.

Option 1 – Wet Ashing (current ashing option, preferred)

Option 1 proposes the continued use of wet ashing at the power station.

The majority of wet ash dams in South Africa are constructed by means of development in an upstream direction as shown in Figure 3-7 below of which the most common method is the daywall system.

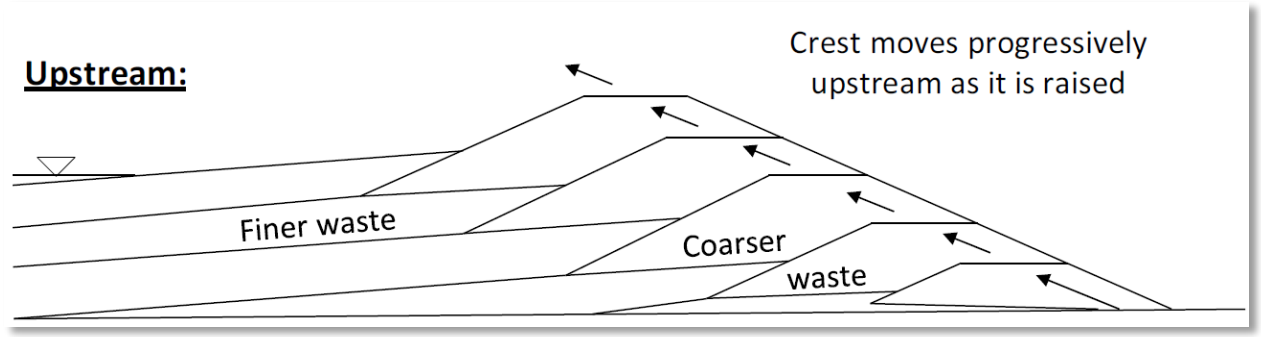


Figure 3-7 | Upstream development of ash dam (Chamber of mines, 1996)

Prior to deposition of ash a starter wall is built. The toe of the dam is defined by using starter walls, which contain the initial deposition. Thereafter construction of the ash dam in an upstream direction starts through the daywall system which separates the ash dam into two areas. The one area is dedicated to day deposition of ash along the perimeter of the dam to form a wall, hence the name daywall. The other areas is dedicated to night deposition into the basin of the dam. The daywall method allows for construction of paddocks to contain the ash and build freeboard[16] thereby impounding the ash deposited during the night.

At present the Pulverised Fuel Ash (PFA) is deposited at a single point (*via* conveyor) where it is slurried[17] and allowed to gravitate along the daywall, whereas the coarse ash is pumped and deposited by open-ended deliveries at a few selected positions around the dam. Option 1 will be a continuation of the ring main delivery system that was installed in 2014. This system consists of a large ring main delivery line with multiple deposition points around the dam.

As the dam fills with ash deposition the walls are raised to contain the incoming ash slurry. This deposition continues until the dam reaches its maximum height. Water is drained from the surface of the dam and piped to the return water dams. Water that seeps through the dam is collected by a leachate system and piped to the return water

[15] Alternative liner systems where not assessed because the obligatory liner system is prescribed by GN. R. 636 of 2013 based on the Waste Classification. The proposed Site 10 ash dams will make use of a Class C liner as described in GN. R. 636 of 2013.

[16] Freeboard is defined as the vertical distance measured from the non-overspill crest (NOC) down to the pool level. The purpose of having freeboard is to ensure a margin of safety if the water levels were to rise and/or wave run-up occurred that the NOC is not overtopped.

[17] A slurry or slurried material is a thin sloppy fluid mixture of a pulverized (reduce to fine particles) solid with a liquid in this case water, used as a convenient way of handling solids in bulk.

dam. This water is then pumped to the power station and re-used by mixing it with the ash for transportation to the ash dams, as slurry.

Option 2 – Dry Ash Stacking

Option 2 considers the use of dry stacking ash at the power station. The method of dry stacking utilises conveyors and stackers to transport and deposit the coarse and fine ash in a conditioned state. The method adopted for this concept is radial stacking (opposed to parallel stacking[18]) whereby the conveyors rotate about one central point as the advancing face progresses from the start to finish points of the facility (see Figure 3-8).

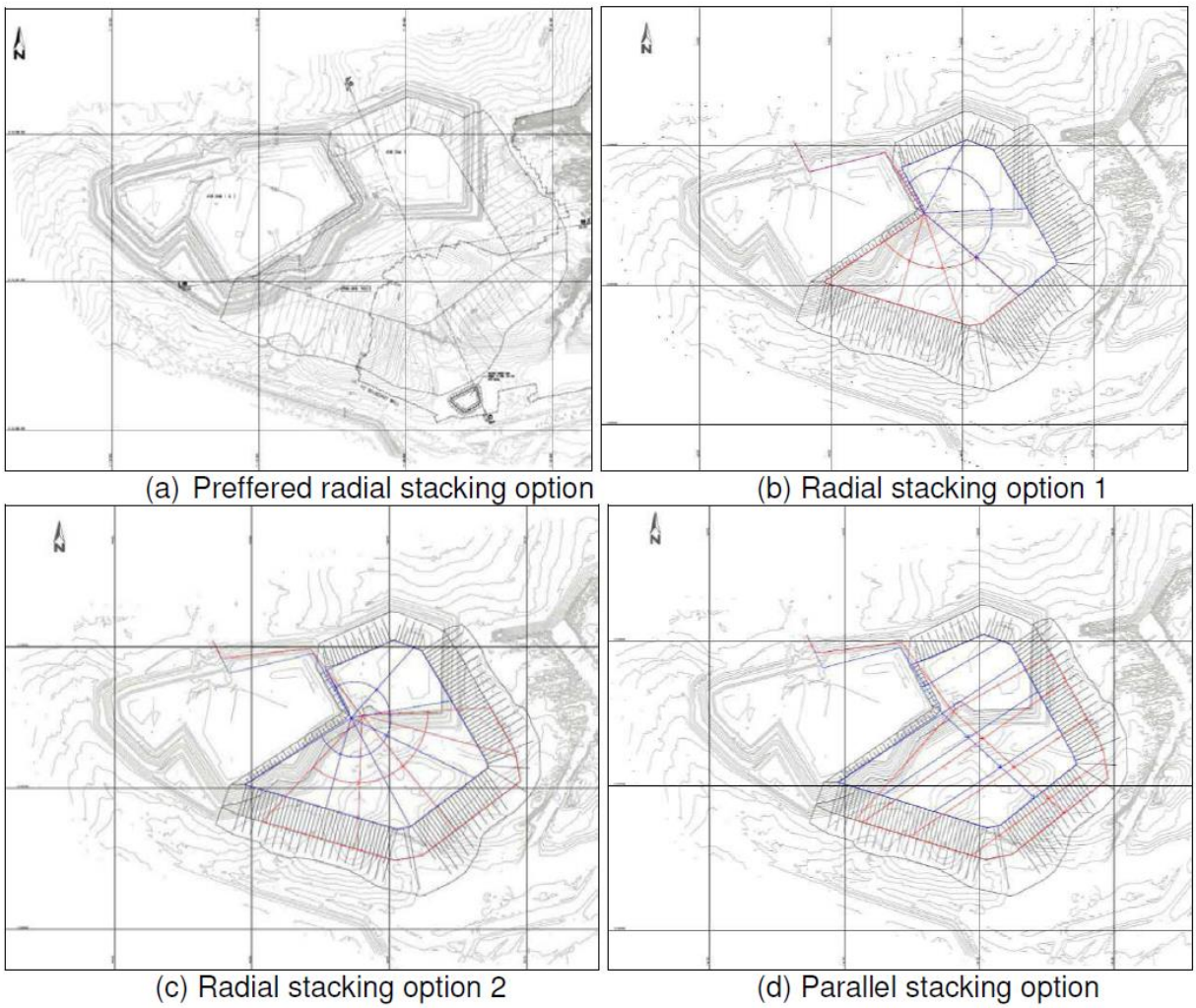


Figure 3-8 | Possible dry stacking configurations considered

Contaminated run-off and supernatant water from the disposal areas would be detained in a return water dam. The dry stacking method contains only a small amount of process water to condition thrash (i.e. 10-20% by weight of the ash) that needs to be accounted for along with the storm water in a return water dam. Dry ash stacking requires less water than the wet ashing option and would improve the water balance significantly. However, Kriel has wet cooling so it generates a lot of wastewater which is used for ash slurrying. Dry ashing would require this water to be treated, which would require different infrastructure requirements.

[18]Parallel stacking was eliminated as the final shiftable conveyors become too short and the time to complete shifts or the time between shifting operations would be as little as 2 months (Jones and Wagener, 2014).

The wet ashing option places some fly ash on Dams 1-3. If no more ash is placed on Dams 1-3 then a larger dry ash dump (and lining) would be required for the ash. However, the geometry of the site with dams 4.1 & 4.2 being built before 4.3 also does not lend itself to building with dry ashing practically.

The method of dry stacking is already in use at the newer Eskom power stations and was thus considered as a worthy option to consider at Kriel Power Station. However, this option would require a change in the station's design, and would entail considerable costs to change the existing wet ashing infrastructure and systems at Kriel Power Station.

Option 3– "No-go" alternative

In terms of the EIA Regulations GN. No. R982 of 4 December 2014, the option of not proceeding with a proposed activity must be considered as an alternative. As such the "no-go" alternative comprises of Option 3. The "no-go" alternative will be assessed against the preferred alternative in EIR as per 2014 EIA regulations.

Conclusion of site alternatives

Recommended option:

The need to investigate alternative ash disposal systems has been acknowledged, to confirm which technology is the most-efficient for future use**.**

The Dry Ash Stacking is scoped out on basis of the following:

- It would require substantial modification in plant.
- It is substantially more expensive (nearly three times the cost) than that of the wet ashing option according to the net present value calculated in 2014.
- The Dry Ash Stacking option would require further investigation into a number of other concerns raised by the 2014 investigation, including:
  - Stability of the advancing face on the liner system. Due to the steep declines in natural ground, the angle of the repose slope that the stacker forms would be unstable and needs to be buttressed by placing a layer of ash that is trucked and placed into position.
  - Differential settlement of the advancing face as the liner is loaded and the front stack develops over the soft pit backfill spoils.
  - Complex arrangement of the mechanical stacking equipment due to the irregular shape of the site.
  - Little flexibility exists to extend ash deposition beyond the current life of the power plant. This is due to the fact that the in-situ density of the dry ash is approximately 20% less than the wet ash.

Given that a wet ashing facility is in line with the station's design and current operations and the significant cost implications of changing to Dry Ash Stacking (at three times the cost of wet ashing technology), it is recommended that wet ashing be the only activity alternative assessed further during the EIA phase.

3.3.5 Summary of recommended alternatives

To summarise, the feasible alternatives which are recommended to be assessed in the EIAR include the following:

- Location alternatives
  - Site 10 for the proposed Ash Disposal Facility and associated conveyor system alignments.
- Site layout alternatives:
  - Ash Dam 4.1 and 4.2. One layout for Site 10 ashing facility and associated infrastructure.
- Activity alternatives:
  - Wet ashing.
- No-go alternative (NEMA requirement against which all alternatives must be measured)

Please refer to Chapters 2 and 5 of this report for more information on the advantages and risks associated with the site, as well as the impacts that require detailed assessment during the EIA phase.

4 THE PUBLIC PARTICIPATION PROCESS

The purpose of this Chapter is to provide an outline of the Public Participation Process, a summary of the process undertaken to date, and the way forward with respect to public participation throughout the EIA process for this project. This Chapter also provides a summary of the key issues that have been raised to date.

4.1 Introduction

In terms of Section 41 of the EIA Regulations (2014) a call for open consultation with all I&APs at defined stages of the EIA process are required. This entails participatory consultation with members of the public and authorities (including DEA and the Department of Economic Development, Environment and Tourism) by providing an opportunity to comment on the proposed project. Consultation with the public forms an integral component of this investigation and enables I&APs (e.g. directly affected landowners, national-, provincial- and local authorities, environmental groups, civic associations, and communities), to identify their issues and concerns, relating to the proposed activities, which they feel should be addressed in the EIA process. The PPP as laid out in Table 4-1 has thus been structured to provide I&APs with an opportunity to gain more knowledge about the proposed project, to provide input through the review of documents/reports, and to voice any issues of concern at various stages throughout the EIA process.

The EIA for the proposed development which was initiated in 2009 and stopped in 2011 undertook a rigorous public participation process and therefore many of the potential issues have been identified and subsequently addressed where still applicable[19]. However, due to the time elapsed since the initial PPP was undertaken between 2009 and 2011, and the fact that there have been important changes in the legislative process, a new PPP will be undertaken.

The objectives of public participation are to:

- Provide project information to the public;
- identify key issues and concerns at an early stage, and continuously;
- respond to the issues and concerns raised;
- to document the EIA process properly; and
- provide a review opportunity for the process and EIA documentation developed

The PPP will be managed to meet these objectives throughout the EIA process. The initial advertising campaign will be broad, thorough and invite members of the public to register as I&APs. Thereafter, the remainder of the communications will be focused on registered I&APs. The PPP to be undertaken for the EIA is summarised in Table 4-1.

[19] Note that many of the previous issues such as building ash dams over backfilled areas and consequent issues are not applicable anymore because of design changes.

Table 4-1 | Summary of the proposed EIA PPP [20]

Task	Details	Date
I&AP notification (relevant authorities and I&APs)		
I&AP identification	An I&AP database was initially developed during 2009-2011 with consideration of the contemporary EIA regulations (NEMA, 2010). During the inception of the EIA process in 2016 the previous I&AP database was updated for the project by establishing the jurisdiction of organisations, individuals and businesses in proximity to the project site or within an interest of the proposed development. The database of I&APs includes the landowner, the adjacent landowners, relevant district and local municipal officials, relevant national and provincial government officials, and organisations. This database will be augmented *via* chain referral during the EIA process and continually updated as new I&APs are identified throughout the EIA process. The current list of potential I&APs is attached in Annexure E.	2009 to 2011 and August 2016
Site notices	Site notices with a size of 600 mm x 420 mm will be placed to inform the general public of the proposed projects and the public participation process.Site notices will be erected at the access roads to Kriel Power Station and Kriel town (i.e. the R545 to Bethal), as well as the: • Canteen, reception, workshop and employee entrance at Kriel Power Station; • Reception and employee entrance at Matla Power Station; • Local municipal offices; • Mica (local hardware store); and • Kriel Colliery and the Exxaro offices at Matla.	26 October 2016
Notification of and comment on Scoping Report		
Notify I&APs and authorities of availability of Scoping Report	All potential I&APs will be informed of the availability of the SR by means of post and/or email. Relevant government departments as listed in Annexure E will be notified of the report and requested to submit comments. I&APs will have 30 days within which to submit comments or raise any issues or concerns they may have with regard to the proposed project or EIA process. The public commenting period will be from 13 October to 14 November 2016. Copies of the SR will be made available for review at the following locations: • Kriel Public Library • Kriel Power Station Furthermore, a digital version of the SR will be uploaded onto the Aurecon and Eskom websites for perusal and download: • Aurecon: http://www.aurecongroup.com/en/public-participation.aspx • Eskom: http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/Pages/Environment_Impact_Assessments.aspx	26 October to 28 November

[20] Proof of public participation is saved as attached as Annexure E

<table>
<tr><th>Task</th><th>Details</th><th>Date</th></tr>
<tr><td>Addressing comments received</td><td>All comments received on the SR will be collated into the Comments and Responses (CRR). The responses to these comments from the applicant and the EAP will be provided in the CRR and will be included as Annexure to the Scoping Report that goes to DEA. The Scoping Report will be updated to respond to submissions in the CRR, as may be necessary.</td><td>29 November 2016</td></tr>
<tr><td>Advertisements</td><td>An advertisement will be placed in the Die Beeld (Regional) and The Ridge Times and The Echo (Local) during the comment period to notify I&APs of the availability of the SR, as well as scheduled public meetings.</td><td></td></tr>
<tr><td>Public Meeting</td><td>All registered I&APs will be invited to attend the scheduled public open house meetings at the following venues:
<table>
<tr><th>Venue</th><th>Date</th><th>Time</th><th>Address</th></tr>
<tr><td>Methodist Church Hall, Kriel</td><td>9 November 2016</td><td>18:00 – 20:00</td><td>Springbok Crescent, Kriel, 2271
Methodist Church Hall, Kriel</td></tr>
<tr><td>Thubelihle Hall</td><td>9 November 2016</td><td>14:00 – 17:00</td><td>Thubelihle Hall</td></tr>
</table></td><td>9 November 2016</td></tr>
<tr><td colspan="3">Notification of and comment on EIA Report</td></tr>
<tr><td>Notify I&APs and authorities of availability of EIR</td><td>All I&APs will be informed of the availability of the EIR by means of post and/or email. Relevant government departments as listed in Annexure E will be notified of the report and requested to submit comments. I&APs will be 30 days within which to submit comments or raise any issues or concerns they may have had with regard to the proposed project or EIA process. The public commenting period will be from 20 January to 22 February 2017.
Copies of the EIR will be made available for review at the following locations:
• Kriel Public Library
• Kriel Power Station
Furthermore, a digital version of the EIR will be uploaded onto the Aurecon and Eskom websites for perusal and download at the following location:
• Aurecon: http://www.aurecongroup.com/en/public-participation.aspx
• Eskom: http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/Pages/Environment_Impact_Assessments.aspx</td><td>January to February 2017</td></tr>
<tr><td>Addressing comments received</td><td>All comments received on the EIR will be collated into the CRR. The responses to these comments from the applicant and the EAP will be provided in the CRR and will be included as an Annexure to the EIR Report. The Environmental Impact Report will be updated to respond to submissions in the CRR, as may be necessary.</td><td>March2017</td></tr>
<tr><td colspan="3">Notification of and opportunity to appeal decision on EIA by DEA</td></tr>
<tr><td>Notify I&APs and authorities of outcome of the EIA</td><td>All I&APs will be informed of the outcome of the EIA process and their right to appeal the outcome or aspects of the outcome by means of post and/or email. Furthermore, a digital version of the decision will be uploaded onto the Aurecon and Eskom websites at the following location:
• Aurecon:http://www.aurecongroup.com/en/public-participation.aspx</td><td>July 2017</td></tr>
</table>

Task	Details	Date
	• Eskom: http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/Pages/Environment_Impact_Assessments.aspx	

4.2 Comments received to date

Public participation has not commenced and therefore no comments have been received to date in terms of the new 2016 EIA process.

4.3 Ensuing review and decision period

I&APs will be afforded a 30-day public comment period on the SR from 20 October to 22 November 2016. I&APs will be notified of the availability of the report and the SR will be lodged at the Kriel Public Library, Kriel Power Station and on the:

- Aurecon website:
  http://www.aurecongroup.com/en/public-participation.aspx; and
- Eskom website:
  http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/Pages/Environment_Impact_Assessments.aspx) and potential.

Cognisance will be taken of all comments in compiling the final report, and the comments, together with the EAP and Applicant's responses thereto, will be included in the final report. Where appropriate, the report will be updated accordingly.

The SR, including the CRR, will be completed and submitted to the DEA for review. The DEA must, within 43 days of receipt of the FSR, consider it, and in writing –

(a) Accept the report and advise the EAP to proceed with the tasks contemplated in the Plan of Study for EIA; and

(b) Refuse Environmental Authorisation

  (i) If the proposed activity is in conflict with a prohibition contained in legislation; or

  (ii) If the Scoping Report does not substantially comply with the objectives and content requirements for scoping reports in terms of the 2014 EIA Regulations and the applicant cannot ensure compliance with these regulations within the prescribed timeframe.

5 DESCRIPTION OF AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

The purpose of this Chapter is to provide a description of the affected environment and the potential impacts that could result from the proposed project. Where additional information is required for detailed assessment in the EIR, the ToR for specialist studies are provided.

5.1 Introduction

The description of the affected environment provided below draws on existing knowledge from published data, previous studies, site visits to the area and discussions with various role-players. The identification of potential impacts which may occur as a result of the proposed activities described in Chapter 3 of this report is broad, to cover the operational phase as well as the construction phase of the project. Impacts of lesser importance are also screened out in this Chapter, with reasons provided, to ensure that the EIR is focused on the potentially significant impacts. These impacts and their proposed mitigation will be provided in the Environmental Management Plan (EMP) at the end of the EIA phase.

5.2 Description of the affected Biophysical and Socio-economic environment

5.2.1 Description of the site

Site 10 is located south to southwest directly adjacent to the existing Ash Disposal Facility at the Kriel Power Station and approximately 5 km to the east of the town of Kriel. The site is approximately 359 ha in extent of which about 172 ha will be affected by the proposed expansion of the Ash Disposal Facility and is zoned agricultural. The proposed Site 10 is located on properties as indicated in Table 5-1. These are the properties will be directly impacted by the project footprint. The properties indicated in Table 5-2 are directly adjacent those affected by the proposed Site 10 development. Table 5-3 provides the general location information for the proposed development site.

Table 5-1 | Properties on which infrastructure for Site 10 is proposed to be constructed

ID	Major region	Parcel No.	Portion	Parent farm name
T0IS000000000 065 00000	IS	65	0	Kriel Power Station
T0IS00000000006900015	IS	69	15	Driefontein
T0IS00000000006900030	IS	69	30	Driefontein
T0IS00000000006900003	IS	69	03	Driefontein
T0IS00000000006900019	IS	69	19	Driefontein
T0IS000000000070 00009	IS	70	9	Onverwacht
T0IS000000000070 00011	IS	70	11/RE	Onverwacht
T0IS000000000070 00023	IS	70	23	Onverwacht

Table 5-2 | Properties directly adjacent to properties on which Site 10 is proposed to be constructed

ID	Major region	Parcel No.	Portion	Parent farm name
T0IS000000000 059 00008	IS	59	8	Nooitgedacht
T0IS000000000 068 00003	IS	68	3	Vaalpan
T0IS000000000 068 00009	IS	68	9	Vaalpan
T0IS000000000 069 00000	IS	68	0	Driefontein
T0IS000000000 069 00001	IS	69	1	Driefontein
T0IS000000000 069 00008	IS	69	8	Driefontein
T0IS000000000 069 00013	IS	69	13	Driefontein
T0IS000000000 069 00017	IS	69	17	Driefontein
T0IS000000000 069 00020	IS	69	20	Driefontein
T0IS000000000 069 00021	IS	69	21	Driefontein
T0IS000000000 069 00022	IS	69	22	Driefontein
T0IS000000000 069 00025	IS	69	25	Driefontein
T0IS000000000 069 00026	IS	69	26	Driefontein
T0IS000000000 069 00031	IS	69	31	Driefontein
T0IS000000000 069 00032	IS	69	32	Driefontein
T0IS000000000 070 00005	IS	70	05	Onverwacht
T0IS000000000 070 00007	IS	70	7	Onverwacht
T0IS000000000 070 00012	IS	70	12	Onverwacht
T0IS000000000 070 00015	IS	70	15	Onverwacht
T0IS000000000 070 00016	IS	70	16	Onverwacht
T0IS000000000 070 00019	IS	70	19	Onverwacht
T0IS000000000 070 00020	IS	70	20	Onverwacht
T0IS000000000 070 00021	IS	70	21	Onverwacht
T0IS000000000 070 00026	IS	70	26	Onverwacht
T0IS000000000 083 00002	IS	83	2	Vlaklaagte
T0IS000000000 141 00000	IS	141	0	Matla Power Station

Table 5-3 | Location information for development

Physical Address where the development will take place	Kriel Power Station, between the towns of Kriel and Ogies in Mpumalanga Postal code 2271
Site centre point	26°16'31.86"S 29°12'1.88"E
Local Municipality	Emalahleni Local Municipality
District Municipality	Nkangala District Municipality

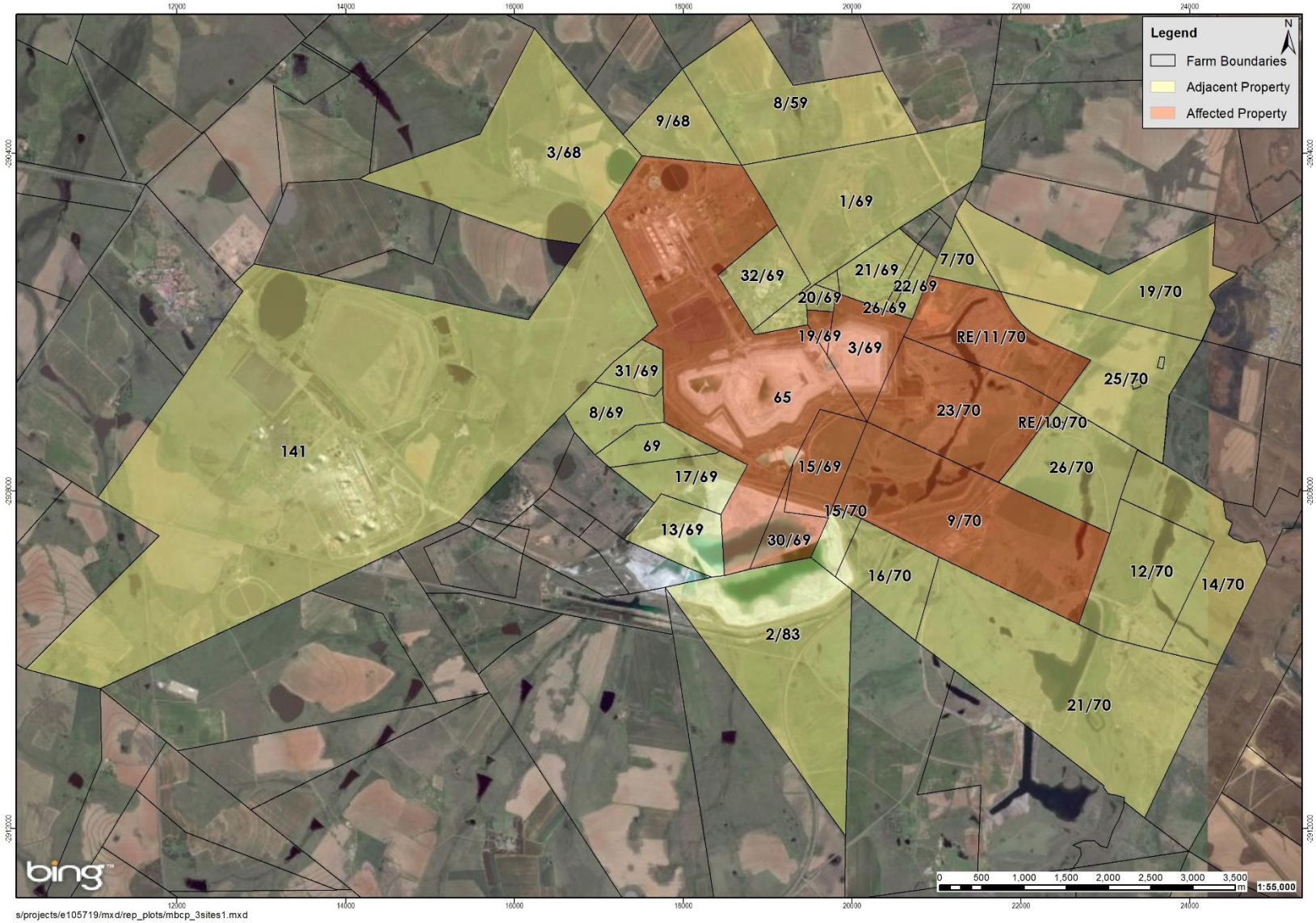


Table 5-4 | The cadastral units around Kriel site

5.2.2 Climate

The broad municipal area is situated in a Highveld climate zone and receives rain during summer months from October to March, mainly through thunderstorms. Throughout the region, 65% of the rainfall occurs during the summer months (December to February) and on average ranges between 601 - 700 mm per annum. The average temperature for the broad municipal area is moderate (average 24.5°C) with frost occurring on average 30 days per annum. Northerly and easterly winds are dominant during the summer months, while easterly winds occur mostly in the autumn months and westerly winds in the winter months (Emalahleni LM, 2009; Airshed, 2010).

5.2.3 Topography and geology

The municipal area is approximately 1 600 m above sea level on the Highveld plateau and is characterised by an undulating landscape with slopes less than 1:30 (Emalahleni LM, 2009). The general surface area surrounding the Kriel Power Station is characterised by mine dumps and open cast mines.

The Kriel Power Station is located within the Great Karoo Basin that contains sediments that were deposited in fluvial floodplains and shallow shelves 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 from Gondwanaland (see Figure 5-1). Dolerites, a prominent feature of the Karoo Basin, intruded after sedimentation in the basin had nearly ceased due to the intrusion of Drakensberg basalt. These dolerite dykes and sills intruded the Karoo sediments along planes of weakness in the older sedimentary. In the vicinity of Kriel, few dolerite intrusions occur apart from a few narrow sub-vertical dykes (J&W, 2010).

The Karoo basin has been subjected to several cycles of erosion, which resulted in weathering at great depths. Rocky outcrops are rare in the Kriel area and are often covered by transported soils. Weathering in the area is largely dependent on climatic conditions with disintegration occurring in the dryer regions and decomposition in the wetter regions. The Kriel area is located within a wetter region and as a result experience decomposition of clay minerals where water is available. Furthermore, Kriel is underlain by the Vryheid Formation (Ecca Group) that contains sediments consisting of sandstones and sub-ordinate gravels and mudrocks with exploitable coal seams. These sedimentary rocks are predominantly horizontally bedded or have very gentle dips. The Karoo sediments are dominated by sandstones and are most often closely intercalated with siltstones and shales/mudrocks (J&W, 2010).

With regards to coal resources, the power station is located on the Kriel Coalfield, which forms part of the Highveld Coalfield and covers an area of more than 25 000 ha. This coalfield is underlain by Dwyka and Middle Ecca strata that are located on an undulating floor containing felsites, granites and diabase that is generally associated with the Bushveld Complex. Coal occurring in fault-margins is often burned and is therefore not mined (Buchan, et al., 1980).

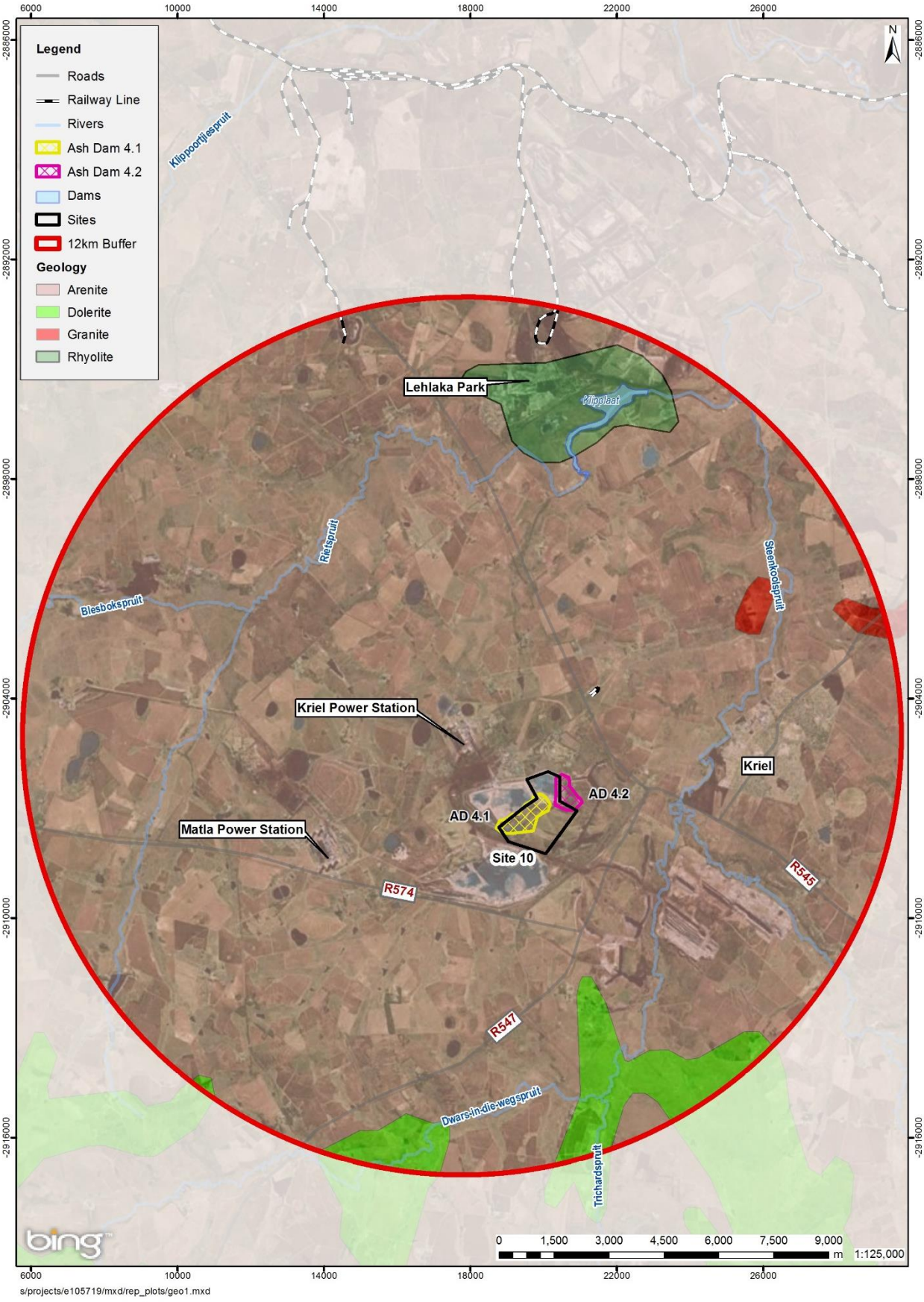


Figure 5-1 | Geology of the sites and surrounding areas

5.2.4 Fauna and flora

The Kriel Power Station is located within the Mesic Highveld Grassland Bioregion as defined by Mucina and Rutherford (2006). The dominant vegetation type found in the vicinity of the power station and surrounding areas is Eastern Highveld Grassland. This vegetation type occurs on plains at a general altitude of 1 520 – 1 780 m, but also as low as 1,300 m, within the Mpumalanga and Gauteng Provinces. The landscape is characterized by slightly to moderately undulating plains as well as low hills with intermittent pan depressions which supports short, dense grassland dominated by general Highveld grass species such as *Aristida, Digitaria, Eragrostis, Themeda* and *Tristachya*. These pan depressions are considered to be important as they provide critical important foraging habitat to two "Near-threatened" Flamingo species (Scherman Colloty & Associates, 2010). Small scattered rocky outcrops that are characterized by wiry, sour grasses and some woody species also occur within this area. Eastern Highveld Grassland is a vulnerable vegetation type with only a handful of patches conserved (SANBI, 2013). The conservation target is 24% (Mucina, 2006). The majority of the vegetation has been transformed due to cultivation, plantations, mining, urbanization and dams (Scherman Colloty & Associates, 2010).

The majority of the area surrounding the power station was considered to be areas of 'No Natural Habitat Remaining' in terms of the MBCP(2007) (see Figure 5-2) this mapping was refined in the MBSP(2014)(see Figure 5-2 and Figure 5-3), which mapped the surrounding area as heavily modified, moderately modified (old lands) and other natural areas. A few areas are marked as 'Important and Necessary' and 'Least Concern'. The MBCP is intended to guide conservation and land-use decisions in support of sustainable development in Mpumalanga. The MBCP areas indicated as 'Irreplaceable', 'Highly Significant' and 'Important and Necessary' should remain unaltered and should be managed for biodiversity by various means.

Wetland areas that are considered to be "Important and Necessary" in terms of the spatial planning frameworks occur within the area of investigation. These wetlands provide important dispersal and ephemeral foraging habitats to faunal species. Furthermore, an important endorheic pan is also located to the northeast of the power station which provides foraging and roosting habitat for "Near-threatened" taxa such as Servals (*Leptailurus serval*) and Flamingos (*Phoenicopterus spp*). Amphibians that are of conservation concern are not expected to occur, however 14 Red listed avifauna species are likely to utilize the area. An estimate of at least 14 reptile taxa (9 snakes and 5 lizard species) are expected to occur within the area, however the species richness is most likely underestimated due to a lack of distributional data. Of these, at least three species are considered to be rare. With regards to invertebrates, the moist grasslands and wetland features could potentially provide suitable habitat for the Marsh Sylph butterfly (Meti*sella meninx*) which is considered to be "Vulnerable" (Scherman Colloty & Associates, 2010).

Figure 5-2 | Sensitivity of Site 10 in terms of the MBCP (2007) on left and MBSP (2014) on the right

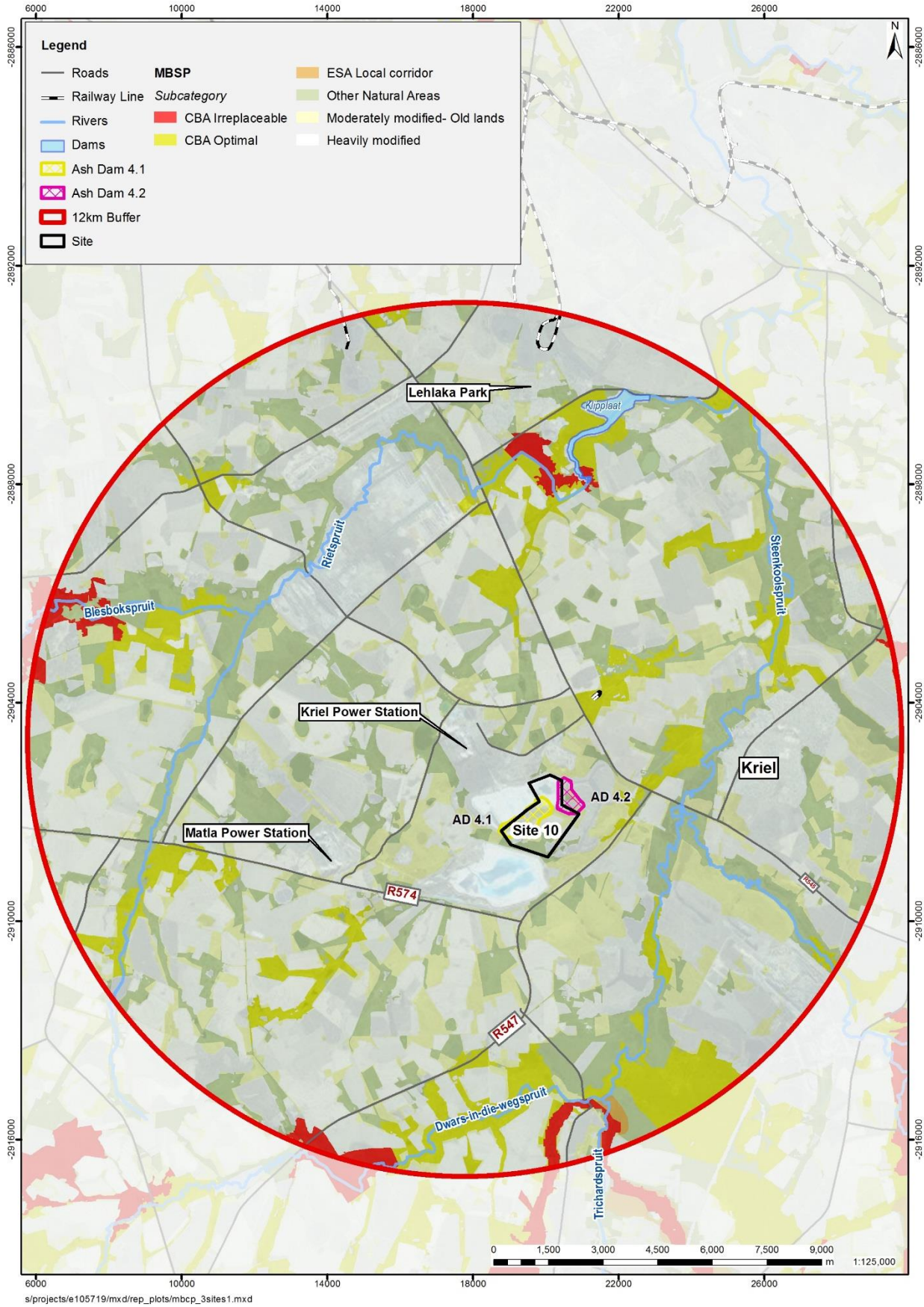


Figure 5-3 | Sensitivity of Site 10 MBSP (2014)

5.2.5 Surface and groundwater

The Emalahleni Local Municipality falls within the Olifants River primary catchment with the Klein-Olifants, Olifants, Wilge, Rietspruit, Steenkoolspruit and Brugspruit being the main rivers in the municipal area. Major dams include the Rietspruit, Doringpoort and Emalahleni Dams (Emalahleni LM, 2009).

The Rietspruit flows to the north of the Kriel Power Station into the Rietspruit Dam from where water enters the Steenkoolspruit, which is located to the southeast of the power station. Both rivers are perennial and fall within the B11E and B11D quaternary catchments, respectively (Figure 5-5). The Rietspruit and Steenkoolspruit both have a Present Ecological Status (PES) of Class C: Moderately Modified and are considered to be Critically Endangered (Aurecon, 2010).

The Kriel area is underlain by sediments of the Vryheid formation. These sediments were deposited in a fluvio-deltaic environment where swamps and marshes existed and peat accumulated. Interlayered shales, mudstones, siltstones and sandstones constitute the bulk of the formation. Furthermore, coal seems are interrupted by numerous minor faults of which many are water bearing. Small fracture zones which are generally associated with the upper and lower contacts of sills (usually water bearing) also occur throughout the power station area[21] (Aurecon, 2010).

Previous investigations in the area suggest that multiple aquifer types are represented at Kriel. These include:

- Unconfined aquifers within soil horizons that developed within colluvial and alluvial environments and the weathered upper levels of Ecca Formation sediments (generally perched on less permeable underlying in situ sediments);
- Unconfined aquifers along dolerite dykes which may also act as recharge points for confined aquifers within the Ecca Formation; and
- Semi-confined aquifers within the Ecca Formation which could be recharging seasonally.

Furthermore, groundwater monitoring data from Site 10 indicated that the site aquifer has been contaminated with elevated SO_4 concentrations and has a high pH that range from 7.17 to 10.2[22], making the water unfit for human consumption (Aurecon, 2010).

5.2.6 Population demographics

The Kriel Power Station is located within the Nkangala District Municipality and Emalahleni Local Municipality. Emalahleni Local Municipality has a total population of 495 000, the Emalahleni LM accounts for the majority of the population within the Nkangala District municipality which stands at 35.4% (Nkangala District Municipality IDP, 2011). Of the 495 000 total population 8.3 % is located in rural areas and 91.7% are urban. The total population comprises 81.3% Black, 15.7% White, 1.7% coloured and 0.9% Indian and Asian people (Emalahleni SDF, 2015).

Employment status is a good indication of the economic environment of a Municipality. The labour force consists of 72.7% of the population which is employed and economically active and 27.3% is unemployed. Emalahleni has a relatively high unemployment rate (27.3%) which surpasses the national unemployment rate of 25.2% (as recorded for the fourth quarter of 2014). Emalahleni LM is characterised by a strong economically active population segment, representing more than half (52.2%) of the total population. large proportion of individuals within the local municipality (51.2%) have at least a secondary (Grade 8-12) level of education, the total number of individuals with a higher education stands at 11.0%, 21.0% have primary education levels (grade 1- 7) while the number of people with no schooling stands at 4.8% (Emalahleni SDF, 2015).

According to the Emalahleni LM SDF (2015), the economy is dominated by four sectors in terms of employment, namely mining (35%), followed by Electricity (14.4%) and finance (14.4%) and then community, social and personal services (10.4).

The occupation structure of the employed people shows that the majority of employed people are concentrated in trade (representing 21.1% of job opportunities), followed by mining (20.6%) and then manufacturing (14.2%).

[21]Prior investigations have identified a near surface, slightly weathered to fresh dolerite sill of which the extent is unknown.

[22]This information was obtained from three monitoring boreholes of which two are located within Site 10 and one directly adjacent to this site. The highest pH value was obtained from a borehole located within Site 10.

5.2.7 Land uses in the surrounding area

The surrounding land use is mainly agricultural, including maize and cattle farming and mining (see Figure 5-4). The power station is located adjacent to the Kriel Colliery, which is dedicated to the Kriel power station and the Matla power station, approximately 5 km to the southeast. The town of Kriel is approximately 7 km to the east of the power station, as well as a small informal settlement approximately 5 km to the southeast. The Thubelihle Township is approximately 11 km to the northeast. The power station also has a small housing development for employees approximately 1 km to the southeast. The Matla Power Station (also coal fired) is situated 4.5 km to the south west of the Kriel Power Station, with the prior's ash dams expanding towards the south. The Exxaro Matla mines (three underground mines) are situated to the east of Kriel with the main facilities about 5.7 km to the east of the Kriel Power Station. A small airfield is located approximately 1 km to the east of the power station and the Kriel Golf Club is approximately 2 km to the southeast. The residential developments Rietstroom Park and Lehlaka Park are approximately 9 km to the north.

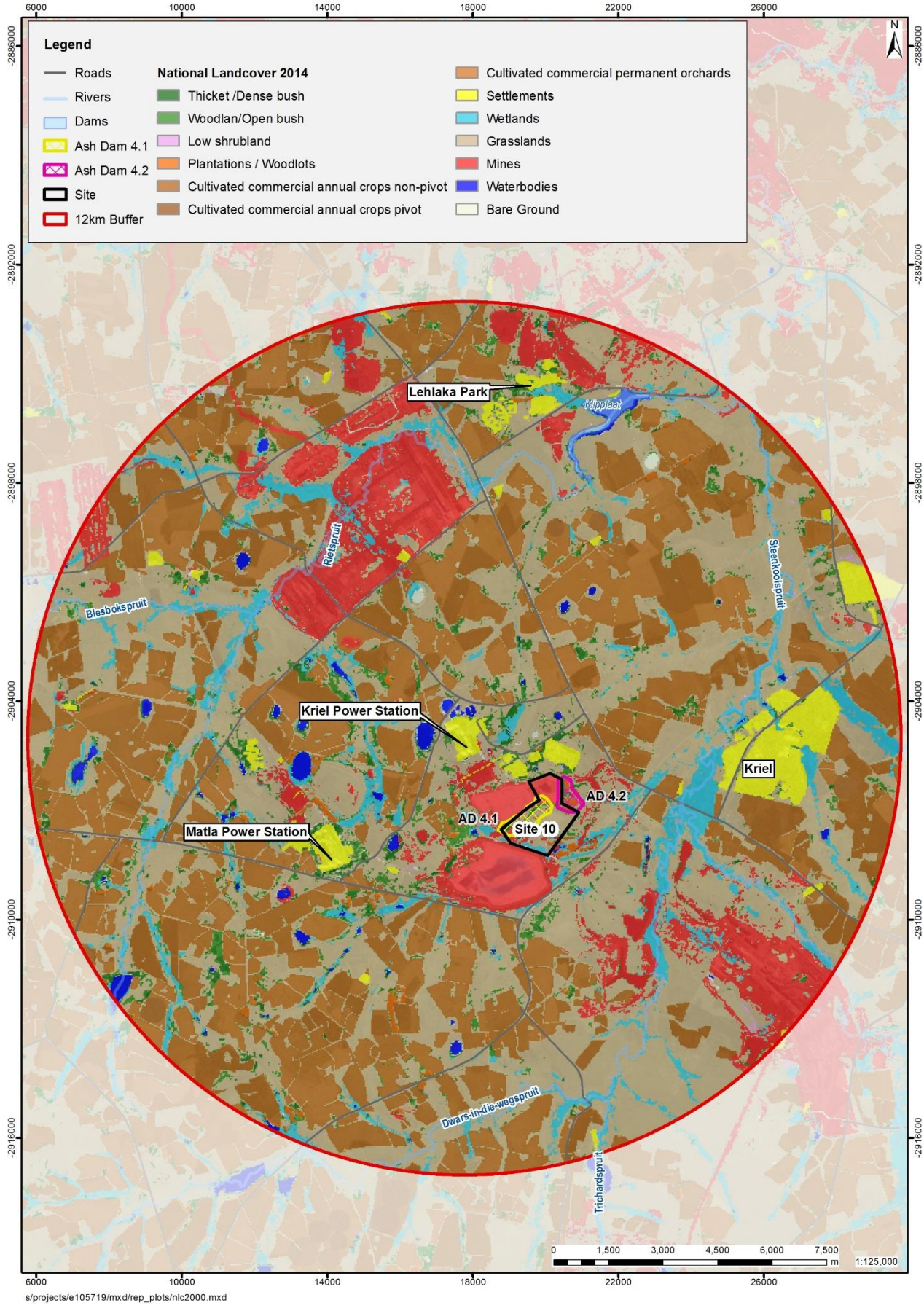


Figure 5-4 | Land uses within the 12 km radius area from the Kriel power station

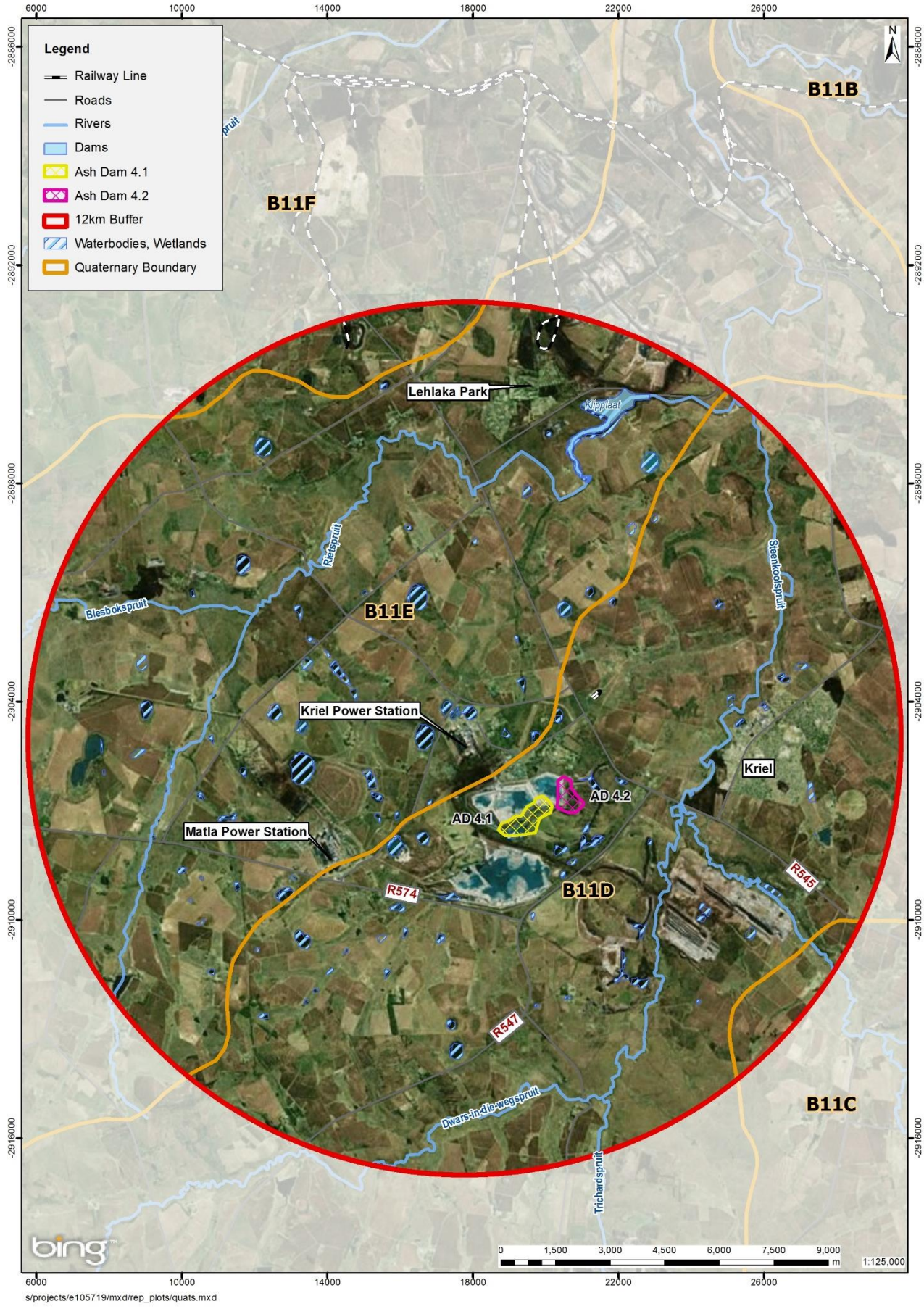


Figure 5-5 | Wetlands and rivers located on the site and surrounding areas as well as quarternary catchments

5.3 Construction phase impacts on biophysical and social environments

The construction phase is likely to result in a number of potential negative impacts on the biophysical and the social environment. These could potentially include:

- Disturbance of flora and fauna;
- Sedimentation and erosion of watercourses;
- Increase in traffic volumes;
- Disposal of hazardous[23] substances on site;
- Increased risk of fire;
- Noise pollution; and
- Dust pollution.

The significance of construction phase impacts is likely to be limited by their relatively short duration. Many of the construction phase impacts could be mitigated through the implementation of an appropriate EMP. During the EIA Phase, the construction phase impacts on the biophysical and socio-economic environment will be assessed, in terms of the methodology outlined in the Plan of Study for EIA (see Section 6). Furthermore, an EMP will be compiled as part of the EIA process, and submitted as part of the EIR, to provide mitigation and ascribe responsibilities for many of the construction phase impacts.

5.3.1 Disturbance of flora and fauna

This impact considers impacts beyond the permanent footprint impacts of the proposed ash facility. Alien plant seeds could be introduced with construction material such as sand or other materials, with any disturbed areas being particularly vulnerable.

Any affected fauna would generally be largely mobile and would relocate during the construction phase and are likely to recolonise the area, once the construction phase has been completed and the disturbed areas rehabilitated.

5.3.2 Sedimentation and erosion

The sediment loads of any drainage depressions and wetlands may increase due to the excavations on the site, the laying of linear infrastructure across drainage lines and other construction related activities. This would be exacerbated during the wet season and during intense rainfall events if not properly managed.

5.3.3 Increase in traffic volumes

Construction vehicles are likely to make use of the existing roads, including the R545, to transport equipment and material to the construction site. Construction related traffic could impact negatively on the traffic flow in the vicinity and on the integrity of the affected roads. This may exacerbate the risk of vehicular accidents.

5.3.4 Storage of hazardous substances on site

As at any construction site, various hazardous substances are likely to be used and stored on site. These substances include amongst other; diesel, curing compounds, shutter oil and cement. Utilisation of such substances in close proximity to the aquatic environment such as wetlands and rivers is of greater concern than when used in a terrestrial environment.

Use of hazardous substances at a construction site is controlled by various pieces of legislation. The management and protection of the environment would however be achieved through the implementation of an EMP, which would *inter alia* specify the storage details of hazardous compounds and the emergency procedures to follow in the event of a spillage.

[23]Note that an ash classification process is underway and will be reported on in the EIA Phase.

5.3.5 Increased risk of fire

Temperatures in the Highveld can rise to 40°C in summer. Furthermore, the grassland vegetation is prone to fires started by lightning strikes in summer. Construction activities onsite may increase the risk of fire in the area in both the wet summer months and the dry winter months. The outbreak of fire at the construction site could have serious safety, economic and ecological implications. The risk of fire would be managed through the EMP, which would include mitigation measures for dealing with emergency situations such as fires.

5.3.6 Noise pollution

An increase in noise pollution would be expected from the operation of heavy machinery during the construction period, as well as due to the increased traffic. The severity of this impact is likely to be reduced due to the low number of people in close proximity to the site, and the existing background noise of the power station. This impact will be assessed as part of the noise impact investigation.

5.3.7 Dust impacts

Construction vehicles are likely to make use of the existing roads, including the R545 and roads to the ash facility, to transport equipment and material to the construction site. Earthworks would also be undertaken. These activities would worsen dust especially in the dry winter months. The dust impact would be managed through the EMP, which would include mitigation measures for dealing with dust pollution events including watering of roads, etc.

5.4 Operational phase impacts on the biophysical environment

This section of the report describes the biophysical environment and considers the long-term or operational phase impacts on the biophysical environment that may be associated with the proposed activities, including the following:

- Impact on the terrestrial fauna and flora;
- Impact on aquatic flora and fauna;
- Impact on groundwater resources; and
- Impact on air quality.

Operational impacts on the socio-economic environment are described in **Section** 5.5, while the construction phase impacts are outlined in **Section** 5.3.

5.4.1 Impact on terrestrial fauna and flora

The vegetation type found in the vicinity of the Kriel Power Station, Eastern Highveld Grassland, is considered to be vulnerable (SANBI, 2013). Areas within the vicinity of the prosed Site 10 are marked as 'Important and Necessary', 'Least Concern' and "No Natural Habitat Remaining' in terms of the MBCP (2007) / MBSP (2014).While the majority of the site is used for agricultural purposes, grasslands do occur within the area between the power station and the proposed sites. The potential occurrence of Red Data listed mammal, avifauna, reptile and invertebrate taxa to occur on Site 10 is low.

Given that the proposed project could disturb vulnerable Eastern Highveld grassland, and/or patches of 'Important and Necessary' areas of land in terms of the MBCP (2007) / MBSP (2014), it is recommended that a specialist terrestrial ecology assessment be undertaken, which focuses on the potentially suitability of the site.

5.4.2 Impact on aquatic flora and fauna

As noted in Section 0 and indicated in Figure 5-5 the Steenkoolspruit and Rietspruit are located within the area surrounding the Kriel Power Station. Furthermore, a number of wetlands and pans are shown to be located in the surrounding areas of the sites.

South Africa recognises the importance of its wetlands as sensitive ecosystems that require conservation, and accordingly has become a signatory to the international Convention on Wetlands of International Importance (also known as the Ramsar Convention). While there are no Ramsar listed wetlands in the vicinity of the sites, the importance of wetland conservation is noted.

Concerns have been raised by the groundwater and ecological specialists that seepage from an ash facility without a liner system could pollute groundwater resources. This would have a negative impact on biodiversity within the Steenkoolspruit and Rietspruit as well as potentially impact on wetlands and pans.

Given the importance of the conservation of water resources in South Africa, specifically wetlands, it is recommended that an aquatic ecology assessment be undertaken.

5.4.3 Impact on groundwater resources

Confined and semi-confined aquifers are present in the area and there is a possibility that seepage from the proposed ash facility at Sites 10 may pollute groundwater resources. Ash from power stations is usually composed of alumina, silica, lime and iron oxides and seepage often contains high concentrations of dissolved salts and potentially elevated concentrations of certain trace elements such as arsenic, boron, manganese, nickel, lead, selenium, molybdenum and fluoride and could contaminate soils and groundwater. In addition, the high pH of ash water (pH12.6) could result in the solution and mobilisation of complex trace metal compounds. However, exposure to the atmosphere, anaerobic microbial action or the mixing of ash water with acidic groundwater would generally lower the pH. Under neutral and acidic conditions the soluble metal complexes and carbonates would precipitate and increase the potential for pollution (J&W, 2006). Groundwater pollution would not only have a negative impact on the water resources, fauna and flora, but could

also potentially impact on agricultural productivity and income. Therefore, a groundwater impact assessment is necessary to determine, *inter alia*, the potential and impact of groundwater pollution on a local and district level.

5.4.4 Impact on air quality

While the industrial sector, including power generation, is very important to the Mpumalanga Highveld region it has been identified as one of the main emission sources that are contributing to the poor ambient air quality. Other important contributors include vehicle tailpipe emissions, household fuel combustion and biomass burning. Industrial sources include stack, vent and fugitive emissions which release criteria pollutants such as SO_2, NO_x, CO and particulates, volatile organic compounds, semi-volatile organic compounds, greenhouse gases and various heavy metals (Airshed, 2010).

A number of coal fired power stations are located close to the Kriel Power Station. These include the Matla Power Station (± 2-4.5 km to the west), Kendal Power Station (± 29 km to the northwest), Duvha Power Station (± 36 km to the northeast) and Hendrina Power Station (± 46 km to the northeast). These power stations emit emissions at an elevated height which have the potential to impact on the air quality of the immediate surroundings. The proposed ash facility has the potential to create airborne particulates (PM10) through wind erosion from the ash facilities and fugitive emissions from operational activities. Furthermore, the impact on air quality from the proposed ash facilities would be additional to the existing poor ambient air quality of the region, as well as sensitive receptors such as the town of Kriel and surrounding settlements. A specialist study is therefore recommended to assess the impact of the proposed ash facilities on the ambient air quality and surrounding environment (Airshed, 2010).

5.5 Operational phase impacts on the social environment

This section of the report describes the socio-economic environment and considers the long-term or operational phase impacts on the social environment that may be associated with the proposed ash facilities, including the following:

- Visual impacts;
- Impact on heritage resources;
- Noise impacts;
- Impact on the local economy;
- Impact on agriculture and other land uses in the study area;
- Impact on traffic;
- Impact on existing infrastructure and services; and
- Impact on health and safety of workers and others in the area.

5.5.1 Visual impacts

The area surrounding the Kriel Power Station is located at some 1 600 m above mean sea level and is gently undulating.

The landscape is covered in grassland with a few sparse trees. As such, the power station is visible for many kilometres in the surrounding area. Site 10 is adjacent to the existing Kriel Ash Disposal Facility and, as such, could limit the visual footprint of the proposed ash facility at this site. It is therefore recommended that a visual impact assessment is undertaken for all three sites.

5.5.2 Impact on heritage resources

Heritage resources include archaeological material (e.g. rock paintings, stone tools), palaeontological material (e.g. fossilised materials) and cultural heritage material (e.g. old graveyards, fences or ruins of buildings).Since some potential heritage material is buried, it is often only found during the construction phase of a project.

Due to the historical disturbances at the sites (construction of the power station, rehabilitated opencast mine, ash dam and agricultural practices) it is unlikely that archaeological or cultural material of value would be found on site. However, the potential remains that the ash facilities, and associated pipelines, could impact on heritage resources. Furthermore,

as noted in **Section** 1.2.4, the construction of a pipeline of over 300 m in length or any development which exceeds 5000 m^2 in extent and will be changing the landscape character, must be subjected to heritage study in terms of NHRA, and be approved prior to the commencement of the construction process.

5.5.3 Noise impacts

The area surrounding the power station consists predominantly of undulating grazing lands. However it also includes the Kriel Colliery and Matla Power Station located to the west of Kriel Power Station. The colliery and power stations are the largest sources of noise pollution in the area, together with the ash conveyance systems and other activities on site. The potential exists for noise from the operations of the proposed ash facility to have a negative effect on surrounding communities.

5.5.4 Impact on local economy

In Emalahleni LM 190 662 people are economically active (employed or unemployed but looking for work), and of these 27.3% are unemployed. Of the 101 062 economically active youth (15 to 34 years) in the area, 36.0% are unemployed.[24]

The decommissioning of the Kriel Power Station due to insufficient ash disposal capacity would result in the loss of jobs. It is unlikely that any new job opportunities would be created during the operational phase, as employees working currently at the existing Ash Disposal Facility would only move to the new facility.

5.5.5 Impact on agriculture and other land uses in the study area

The proposed ash facility is likely to impact on the following surrounding land uses: agriculture, power generation and coal mining. With regards to power generation and coal mining, the ash facility is unlikely to have a significant negative impact (but arguably is important in the continuation of these activities in the area).However, the impact of having an ash facility on productive agricultural land is likely to impact on the livelihood security of affected farmers and farm workers. It is therefore recommended that an agricultural potential assessment be undertaken to determine the agricultural potential of the candidate sites, and the potential impact on agricultural activities due to the subsequent loss of land, should it be necessary.

5.5.6 Impact on traffic

The proposed project is likely to result in a limited increase in traffic volumes during the construction and operational phase of the project. However, the proposed conveyor system route would need to cross road(s) in some places and could potentially be routed beneath the road, thus allowing the continued use of the existing roads.

5.5.7 Impact on existing infrastructure and services

Existing infrastructure and services in the surrounding area of the Kriel Power Station includes numerous tarred and dirt roads, for example the R545 to the south of the power station, the R547 to the southwest, the R580 to the northwest Figure 5-6. Other infrastructure in the area includes pipelines, power lines, canals, mineshafts, rivers and the Komati Water Scheme Pipeline. It is not expected that the proposed ash facility would impact on any of these infrastructure or services.

However, the possibility of collapse settlements in the foundations at Sites 10 potentially poses significant risks in terms of environmental (groundwater in particular) pollution and operation of the ashing facility and surrounding mines, which includes health and safety concerns. These opencast mines were backfilled with a mixture of transported and residual soils and excavated rock overburden with a particle size that ranges from 2 µm to large rock bounders in excess of 2 m in length. Settlement of backfilled areas under the weight of an ash facility can be significant and is of concern for the following reasons:

[24] http://www.statssa.gov.za/?page_id=993&id=emalahleni-municipality-2, accessed 2016-09-14

- Reduced efficiency of surface draining on the surface and embankments of the facility over the long term;
- Reduction in the freeboard should significant differential settlement occur;
- Development of a sinkhole in the facility should saturation cause localised collapsing of the foundation; and
- Formation of large cracks in the embankment wall which in turn increases the risk of failure and seepage contamination.

Importantly, whilst the infrastructure currently proposed falls within the area of the originally assessed Site 10, the ash dam footprints will not be over the backfilled areas and therefore the above issues is not foreseen by the technical (J&W, 2016) teams designing the facility.

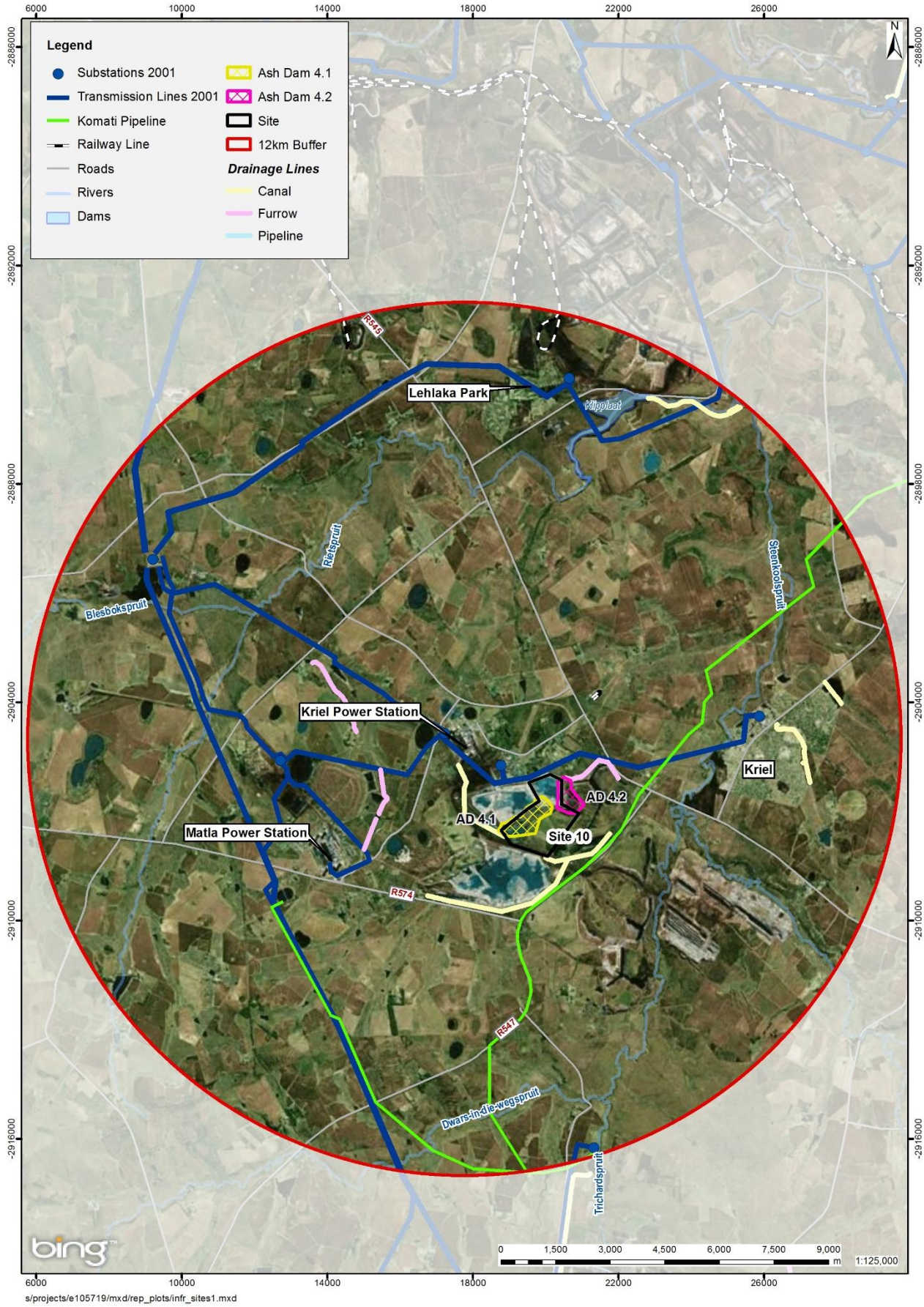


Figure 5-6 | Infrastrucure around the Kriel Power Station

5.5.8 Impact on health and safety of workers and others in the area

The proposed Ash Disposal Facility will be constructed in terms of the final detailed design[25], which would be informed by various technical, financial and environmental criteria, including the recommendations made by the EIA specialists. In particular, the geotechnical specialist needs to determine the stability of the site (AD4.3) and suggest appropriate design measures that guarantee the operational safety of the future ash facility as discussed in **Section** 5.5.8.

Furthermore, the proposed ash facility will be managed according to the existing health and safety requirements of the Power Station. The contract for the construction and operation of the facility[26]will go out on tender following receipt of the requisite regulatory approvals and the selected operator will be required to operate the facility in terms of the Operational plan as well as various conditions of approval. This would include implementation of the specifications included in the Operational EMP, which would be guided by the findings and recommendations of the EIA specialists.

[25]The conceptual design is currently (2016-09-14) being revised by Jones and Wagener.
[26]The Kriel ash disposal facility is currently being operated by Roshcon.

6 PLAN OF STUDY FOR EIA

The purpose of this Chapter is to detail the Plan of Study for the EIA Phase to ensure that this EIA process satisfies the requirements of NEMA.

6.1 Purpose of the Plan of Study for EIA

The Scoping process has been documented in this report, which has identified various potential environmental impacts and project alternatives that require further detailed assessment in the EIA phase. This Plan of Study for EIA is the culmination of the Scoping Phase and its purpose is to ensure that the EIA Phase satisfies the requirements of NEMA and NEMWA. Accordingly, this Plan of Study for EIA outlines the anticipated process and products for the EIA Phase.

This Plan of Study for EIA has been compiled in terms of NEMA GN R. 982 of 4 December 2014 and NEMWA, GN R. 921 of 29 November 2013 and will be submitted to DEA for their consideration.

6.2 Description of the activity

The nature of the activity is described in detail in **Chapter 3.** The developmental infrastructure would be constructed includes the following:

- An Ash Disposal Facility that would have sufficient capacity for the remaining operational life of the power station until 2039 plus a five year contingency to 2045;
- An AWR dam from where decant and drained water would be pumped back to the power station for re-use;
- An AWR transfer dam;
- Delivery and return infrastructure, including pipelines, transfer houses, pump stations;
- Powerlines;
- Access roads; and
- Clean and dirty water collection channels/trenches Ash Disposal Facility.

6.3 Feasible project alternatives recommended from the scoping processes

Chapter 3 reviewed a range of project alternatives associated with the proposed activities. Pursuant to this Scoping exercise, which was based on input from various specialists, a shortlist of feasible project alternatives has been identified for further, more detailed investigation during the EIA Phase, namely:

- Location alternatives
  - Site 10 for the proposed Ash Disposal Facility and associated conveyor system alignments.
- Site layout alternatives:
  - Ash Dam 4.1 and 4.2. One layout for Site 10 ashing facility and associated infrastructure.
- Activity alternatives:
  - Wet ashing.
- No-go alternative (NEMA requirement against which all alternative should be measured)

6.4 Description of tasks to be performed

6.4.1 Potential environmental impacts identified during Scoping

Chapter 5 has reviewed the range of potential environmental impacts associated with the proposed Ash Disposal Facility for the Kriel Power Station in Mpumalanga. Pursuant to this Scoping exercise, which was based on available literature, a

detailed screening exercise, I&APs and various specialists, a shortlist of potentially significant environmental impacts was identified for further, more detailed assessment during the EIA Phase. Specifically the following potential environmental impacts have been identified:

- Construction phase impacts on the biophysical and social environments:
  - Disturbance of flora and fauna;
  - Sedimentation and erosion of water ways;
  - Increase in traffic volumes;
  - Disposal of hazardous[27] substances on site;
  - Increased risk of fire;
  - Pollution (noise, air and water); and
  - Dust impacts.
- Operational phase impacts on the biophysical environment:
  - Impacts on the terrestrial fauna and flora;
  - Impacts on aquatic flora and fauna;
  - Impacts on groundwater resources; and
  - Impact on air quality.
- Operational phase impacts on the social environment:
  - Visual impacts;
  - Impact on heritage resources;
  - Noise impacts;
  - Impacts on the local economy;
  - Impacts on agriculture and other land uses in the study area;
  - Impacts on traffic;
  - Impacts on existing infrastructure and services; and
  - Impacts on health and safety of workers and others in the area.

6.4.2 Method of assessing the significance of potential environmental impacts

This section outlines the proposed method for assessing the significance of the potential environmental impacts outlined above. As indicated, these include both operational and construction phase impacts.

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

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

[27]Note that an ash classification process is underway and will be reported on in the EIA phase.

Table 6-1 | Assessment criteria for the evaluation of impacts

Criteria	Category	Description
Spatial influence of impact	**Regional**	Beyond a 10 km radius of the candidate site.
	Local	Between 100m and10 km radius of the candidate site.
	Site specific	On site or within 100 m of the candidate site.
Magnitude of impact (at the indicated spatial scale)	**High**	Natural and/ or social functions and/ or processes are *severely* altered
	Medium	Natural and/ or social functions and/ or processes are *notably* altered
	Low	Natural and/ or social functions and/ or processes are *slightly* altered
	Very Low	Natural and/ or social functions and/ or processes are *negligibly* altered
	Zero	Natural and/ or social functions and/ or processes remain *unaltered*
Duration of impact (temporal)	**Construction period**	From commencement up to 2 years of construction
	Short Term	Between 2and 5 years after construction
	Medium Term	Between 5 and15 years after construction
	Long Term	More than 15 years after construction

The **SIGNIFICANCE** of an impact is derived by taking into account the temporal and spatial scales and magnitude. The means of arriving at the different significance ratings is explained in Table 6-2.

Table 6-2 | Definition of significance ratings

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

Once the significance of an impact has been determined, the **PROBABILITY** of this impact occurring as well as the **CONFIDENCE** in the assessment of the impact, would be determined using the rating systems outlined in Table 6-3 and

Table 6-4, respectively. It is important to note that the significance of an impact should always be considered in concert with the probability of that impact occurring. Lastly, the **REVERSIBILITY** of the impact is estimated using the rating system outlined in Table 6-5.

Table 6-3 | Definition of probability ratings

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

Table 6-4 | Definition of confidence ratings

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

Table 6-5 | Definition of reversibility ratings

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

6.4.3 Stages at which the competent authority will be consulted

The competent authority was consulted during the pre-application meeting (21 September 2016, in Pretoria at DEAs Arcadia offices). Furthermore, the DEA as competent authority will be consulted during the 30day scoping phase public participation period and the 30 day EIA phase public participation period. The DEA will also be consulted if *ad hoc* scenarios arise which require their input. The NEMA 2014 EIA diagram, Figure 6-1 below indicates the stages at which the DEA will be consulted or provided opportunity to comment on the EIA.

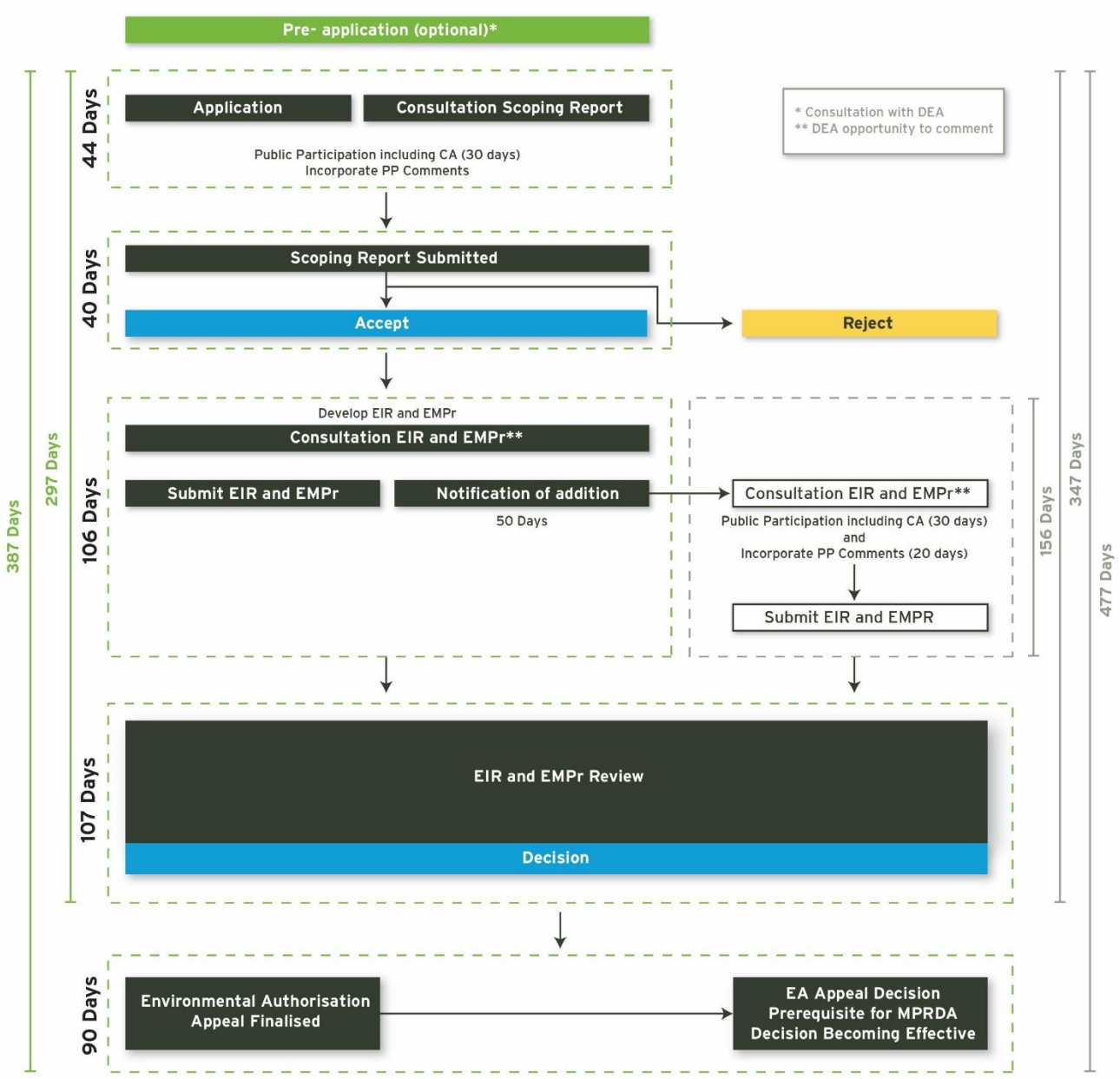


Figure 6-1 | The EIA process in terms of the NEMA 2014 EIA Regulations

6.5 Need for detailed investigations: Specialist studies

In reviewing the potential environmental impacts, all impacts initially identified during the Scoping Phase have been identified as being of concern and requiring further investigation. Accordingly, the following specialist studies will be undertaken to address a suite of potential environmental impacts:

Study	Consultant and Organisation
Terrestrial ecology impact assessment	Dr Brian Colloty, Scherman Colloty and Associates
Aquatic ecology impact assessment	Dr Brian Colloty & Dr Patsy Sherman, Scherman Colloty and Associates
Groundwater assessment	Mr Louis Stroebel, Aurecon
Air quality impact assessment	Ms Renee von Gruenewaldt, Airshed Planning Professionals
Visual impact assessment	Mr Johan Goosen, Aurecon
Heritage impact assessment	Mr Polke Birkholtz, Professional Grave Solutions: Heritage Unit
Noise impact assessment	Mr Derek Cosijn, Jongens Keet Associates
Agricultural / land capability and economic impact assessment	Mr Paul Vermaak, Sole Proprietor & Mr F Botha, Eco-Soils

Study	Consultant and Organisation
Traffic impact assessment	Mr Werner Heyns, Aurecon

The ToR for these investigations as well as a short summary of the various specialist consultants is given below. CVs are available upon request.

6.5.1 Terrestrial ecology impact assessment

Scherman Colloty & Associates, represented by ***Dr Brian Colloty***, was appointed to undertake the terrestrial and aquatic assessments in 2009 and was reappointed to undertake both the terrestrial and aquatic studies, inclusive of summertime monitoring. Dr Colloty is an ecologist with a BSc (Hons) degree in Zoology and a doctorate in botany and has extensive knowledge of the region and experience in undertaking assessments and has been involved in various terrestrial and wetland assessment of the Steenkoolspruit / upper Olifants River systems in the past five years. Dr Colloty has also presented at various wildlife conferences and/or for societies.

The proposed ToR for terrestrial fauna and flora impact assessment is as follows:

- Conduct an ecological and floristic assessment to determine the present state of the environment on the sites and to identify potential impacts that could be caused by the proposed activity. The report must address the following:
  - Flora
    - Description of general floristic species diversity and community composition;
    - Identification of rare and endangered species (Red data species);
    - Physiognomic units based on floristic relevès; and
    - Ecological condition (successional stage) of predetermined physiognomic units.
  - Terrestrial fauna
    - Detailed faunal assessment, including a small mammal trapping session and nocturnal surveys;
    - Avifaunal assessment; and
    - Evaluation of the occurrence of the Marsh Sylph butterfly (*Metiselle mininx*) due to its conservation status.
  - Rank sites according to the significance of the site's impact on terrestrial fauna and flora;
  - Identify and describe ecosystem services;
  - Recommendation of mitigation measures to reduce or eliminate potential impacts on the terrestrial ecological environment.

6.5.2 Aquatic ecology impact assessment

Dr Patsy Sherman of Scherman Colloty and Associates is an ecologist with extensive experience in wetland and river ecology. Dr Sherman has previously undertaken assessments on the Olifants River catchment in terms of water quality impacts and is currently reviewing the water quality aspects of a number of IWULA s submitted by various collieries in the Witbank / Middleburg region.

The proposed ToR for this aquatic ecology impact assessment is as follows:

- Undertake a wetland and river assessment, which entails the following tasks:
  - Delineation and classification of the wetlands within the proposed sites;
  - Identification and mapping of suitable buffer zones;
  - Identify and describe ecosystem services;
  - Assessment of the status of observed faunal and floral populations;
  - Assessment of potential impacts on the drainage area's water quality and quantity;
  - Rank sites according to the significance of the site's impact on aquatic fauna and flora; and
  - Identification of possible recommendations for mitigation.

6.5.3 Groundwater assessment

Mr Louis Stroebel is a qualified geohydrologist with more than 15 years' experience in several geohydrological investigations. His extensive field experience combined with report writing, project management, etc. associated with

rural water supply activities and Environmental Management Reports have led to the development of a good understanding of the fundamentals of geohydrology. Mr Stroebel also gained international experience in the clean-up of land and marine based organic contaminants during an 8 month secondment in Europe. He obtained his accreditation with the South African Council for Natural Scientific Professions in 2002, when he was registered as a Professional Environmental Scientist (No. 400027/02).

The ToR for the groundwater assessment is as follows:

- Undertake a hydrocensus and geophysical survey of the sites to better understand the characteristics of the aquifer and groundwater flow patterns;
- Undertake aquifer testing to obtain a reliable estimate of hydraulic conductivity of the aquifers receiving groundwater from the ash facility;
- Develop a numerical flow and transport model to identify and quantify impacts that the ash facility could have on the groundwater environment;
- Rank sites according to the significance of the site's impact on groundwater resources;
- Provide recommendations for mitigating the impacts; and
- Compile technical documents for Eskom's water use license application which will include results from the hydrocensus, interpretation of the geophysical survey, drilling and borehole results, aquifer classification, a hydro geochemical description, the outcome of the numerical flow and transport model and a prediction of the impact of the proposed ash facility on the geohydrological environment as a function of time, as the facility grows in height.

6.5.4 Air quality impact assessment

Ms Renee von Gruenewaldt has more than 10 years' experience in the field of air pollution impact assessment and air quality management. Ms von Gruenewaldt has undertaken numerous air pollution impact studies and has provided extensive guidance to both industry and government on air quality management practices.

The ToR for the air quality impact assessment is as follows:

- Identification and quantification of all sources of atmospheric emissions associated with the ash facilities expansion;
- Simulation of ground level PM10 concentrations and dust fallout through a dispersion model to determine and predict zones of maximum incremental ground level impacts from all sources;
- Evaluation of potential impact on human health and the environment; and
- Development of a Dust Management Plan.

6.5.5 Visual impact assessment

Mr Johan Goosen is employed as an environmental planner and landscape architect and at Aurecon. He has more than 15 years' experience in landscape architecture and environmental planning in a wide variety of sectors. His expertise includes urban open space planning and regional environmental planning frameworks, end land use planning for mining and waste facilities and brownfields site re-development. He has further been involved in numerous projects requiring environmental screening, impact assessment/permitting, construction monitoring and visual impact assessment (VIA) for linear infrastructure such as roads, rail, bulk water, urban and rural property developments and the mining and metals sector. Johan holds a Bachelor in Landscape Architecture, which he obtained from the University of Pretoria (UP) in 1998, and completed a Graduate Diploma in Environmental Engineering from the Witwatersrand University (WITS) in 2014. He is a member of both the International Association of Impact Assessment (IAIA) and the Institute for Landscape Architecture in South Africa (ILASA). He is also a Registered Professional Landscape Architect with the South African Council for Landscape Architectural Professionals (SACLAP).

The ToR for the visual impact assessment is as follows:

- Undertake a review of baseline information, describe the receiving environment; and establish a view of the catchment area, view corridors, viewpoints, receptors and identification of potential lighting impacts at night;

- Undertake an assessment of the visual impacts at the candidate sites, in terms of the scale of impact (local, regional, national), magnitude of impact (low, medium or high) and the duration of the impact (construction, up to 10 years after construction and more than 10 years after construction);
- Rank sites according to the significance of the sites' visual impact; and
- Identify mitigation measures to reduce or eliminate the potential visual impacts identified.

6.5.6 Heritage impact assessment

Mr Polke Birkholtz from Professional Grave Solutions (Pty) Ltd (PGS Heritage Unit) was appointed to undertake the requisite Heritage Impact Assessment in 2009 and has been appointed to update this study. Mr Birkholtz has been involved in heritage related studies and grave relocations since 1997. Mr Birkholtz has acted as project manager on numerous heritage impact assessments throughout South Africa, as well as Phase 2 Mitigation in Mpumalanga, Limpopo, the North West Province and Gauteng. He has also been involved in projects in Swaziland and Botswana. Mr Birkholtz is a member of the Association of Southern African Professional Archaeologists.

The ToR for the heritage impact assessment is as follows:

- Undertake field work to verify results of desktop investigation;
- Document (GPS coordinates and map) all heritage sites, objects and structures identified on the site;
- Compile a report which would contain the following:
  - Identification and mapping of heritage resources in the area of investigation;
  - Assessment of significance of these resources in terms of the heritage assessment criteria;
  - Assess impact of the proposed ash facilities on these heritage resources;
  - Consider alternatives;
  - Rank sites according to the significance of the site's impact on heritage resources; and
  - Identify mitigation measures for construction and operational impacts.

6.5.7 Noise impact assessment

Mr Cosijn is a partner with Jongens Keet Associates and Calyx Environmental cc. He is a professional engineer registered with the Engineering Council of South Africa (ECSA), a Fellow of SAICE, a Member of the Southern African Acoustics Institute (SAAI) and is also certified as an Environmental Assessment Practitioner of South Africa. His area of special expertise is environmental noise (acoustical engineering) and has 45 years of professional experience over a wide range of civil engineering, transportation planning, environmental and acoustic engineering projects.

The ToR for the noise impact assessment is as follows:

- Establish the existing noise climate of the site;
- Undertake a detailed quantitative and qualitative assessment on the impact of the proposed ash facilities on the area of influence in terms of the nature, magnitude, extent and implications thereof;
- Assess potential impacts in terms of construction and operational phases, as well as cumulative impacts;
- Rank sites according to the significance of the site's noise impact; and
- Identify appropriate noise mitigation measures.

6.5.8 Agricultural / land capability and economic impact assessment

Mr Paul Vermaak was appointed to undertake an assessment of the land uses in the surrounding landscape, as well as the land capability rating of the properties investigated in 2009. He has been reappointed to update the Agricultural Impact Assessment. Mr Vermaak is a Geologist and Pedologist with over 13 years of experience in the Earth and Natural Sciences sectors and had been involved in providing solutions to EPCM turn-key projects in the mining and minerals industry. He has also gained work experience through projects in and throughout Southern Africa (Swaziland, Mozambique, Malawi, Zimbabwe, Botswana and the Democratic Republic of the Congo) and has developed a broad and diverse experience base. **Mr F Botha** of Eco-Soils was commissioned to provide information in terms of the chemical and

physical nature of the soils (which would not have changed significantly in the last 5 years) and to provide an economic analysis of the agricultural potential of the properties. Mr Botha has been involved in numerous soil classification and land capability studies, as well as economic and agronomic feasibility studies. The economic analysis of the agricultural potential will be recalculated and assessed during this EIA process.

The ToR for the agricultural impact assessment is as follows:

- Undertake a literature review and collection of baseline data, to establish the status quo of agricultural practices and resources within the study areas and on a national level (detailed grids will not be undertaken);
- Undertake fieldwork to gather additional data and to determine soil potential and describe soil characteristics, both physical and chemical;
- Interpret soil chemical analysis for soil fertility purposes;
- Interpret soil physical features such as texture, structure, drainage, etc.;
- Determine the land capability and land use of the sites (crop and grazing potential), including economic analysis;
- Provide a clearly mapped distinction of the agricultural potential of the land;
- Undertake an assessment to predict the potential impacts on agricultural potential;
- Rank sites according to the significance of the impact on land use / agricultural potential; and
- Identify mitigation measures that could reduce or eliminate the identified impacts.

6.5.9 Traffic impact assessment

Dr Werner Heyns of Aurecon has been appointed to undertake the traffic impact assessment. Werner is a technical director specialising in transport planning and traffic engineering working in the Tshwane office. He has more than 17 years' collective experience in transport/development planning and highway maintenance and design. He has worked on projects promoting sustainable development requiring technical input through the delivery of transport impact assessments, feasibility studies, master planning, policy formation studies, green travel plans and parking and traffic studies. In the past Werner provided input into SEA's and EIA's, cost benefit analysis for roads and transport user benefit assessments of selected projects, strategic modelling, public transport infrastructure and service audits. Werner has sound transport planning and traffic engineering skills, knowledge and capabilities, enabling clients to realise their land and transport planning aspirations. Werner is a professional planner registered with SACPLAN, a member of the Institute of Highways and Transportation and a Chartered Member of the Institute of Logistics and Transport. He holds a PhD in Transport Planning from the North-West University in South Africa.

The ToR for the traffic impact assessment is as follows:

- Assess the current traffic situation with regards to intersections capacity, road network capacity, public transport and other traffic engineering related aspects relevant to the area;
- Assess the impact of the proposed ash facility on the current traffic situation;
- Provide preference on sites in this regard; and
- Identify appropriate mitigation measures where relevant.

6.6 Ash Disposal Facility Environmental Impact Assessment Report (EIR)

Should the DEA approve this Plan of Study and the project proceeds to the EIA Phase, an EIR will be produced. The purpose of the EIR would be to present a comparative assessment of the relative significance of the potential environmental impacts for the proposed ash facility, location and layout alternatives. The EIR would thus include the following:

- A description of potential environmental impacts and reasonable alternatives identified during the scoping investigation.
- Key findings of the various specialist studies as they pertain to the affected environment.
- An overview of the public participation process conducted during the compilation of the EIR.

- A detailed assessment of the significance of the potential environmental impacts for the various project alternatives. This assessment, which would use the methodology outlined in **Section** 6.4.2, would be informed by the findings of the specialist studies, and professional judgement.
- The full range of mitigation measures including an indication of how these would influence the significance of any potential environmental impacts, together with a Construction and Operational EMPr. The mitigation measures would be informed by the specialist studies, professional experience and comment received from I&APs.

6.7 Public participation process

The purpose of the public participation process is to provide I&APs with adequate opportunity to have input into the EIA process. The public participation process during the EIA Phase would include the following:

6.7.1 Public comment on the EIR

Following the completion of the EIR (refer to **Section 4**above), it will be lodged at the Kriel Public Library and the security centre at Kriel Power Station, as well as on the Eskom and Aurecon websites:

- **Eskom:**http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/Pages/Environment_Impact_Assessments.aspx
- **Aurecon:** http://www.aurecongroup.com/en/public-participation.aspx

Registered I&APs will be notified of the lodging by means of letters (mailed and/or emailed), and given 30 days in which to comment on the report. During the comment period a public meeting would be held in Kriel and Thubelihle during which the EIA team would present the findings of the draft EIR and provide I&APs with the opportunity to provide feedback on the draft report. Registered I&APs will be notified of the meeting by way of the letters used to inform the I&APs of the lodging of the EIR. Any necessary Focus Group discussions will also be arranged.

All written correspondence would be in English. The public meeting would be presented in English, but translations to Afrikaans and/or any other dominant local language will be available on request.

The public comments would be consolidated into an annexure of the EIR. This will take the form of a CRR, which would summarise the issues and concerns raised and provide the Project Team's responses thereto. The report will also be revised in light of feedback from the public, where necessary. The document will be submitted to DEA for their decision making process.

6.7.2 Opportunity for appeal

All registered I&APs would be notified in writing of the receipt of the authorities' decision and will be provided with an opportunity to submit an appeal, if allowed for in the decision. They would be reminded of their right to appeal against DEA's decision in terms of NEMA and NEMWA.

6.8 Proposed programme

A summary of the proposed programme is given in the table below.

Table 6-6 | Proposed EIA programme

Activity	Proposed date	Deliverable
1st round of public engagement:		
• Letter to I&APs & adverts	26/10/2016	Informed I&APs
• Lodge draft SR in public venues and with Authorities	26/10/2016	SR in libraries, websites etc.
• Open day & public meeting	09/11/2016	Public engagement
• Public comment period ends	28/11/2016	Updated CRR
Submit final SR (incl. Plan of Study for EIA) to environmental authority	29/11/2016	Approved SR & Plan of Study EIA

Activity	Proposed date	Deliverable
Specialist studies	23/11/2016	Specialist reports
2nd round of public engagement:		
• Letter to I&APs & adverts	20/01/2017	Informed I&APs
• Lodge EIR in public venues	20/01/2017	Draft EIR in libraries, website etc.
• Public comment period ends	22/02/2017	Updated CRR
Submit final EIR to DEA	13/03/2017	Decision from DEA
3rdround of public engagement:		
• Letter to I&APs to notify them on DEA decision	04/06/2017	Authorities' decision.

6.9 Personnel

As for the Scoping phase, Aurecon's Andries van der Merwe provides strategic guidance to the EIA process and Franci Gresse undertakes the management of the EIA process and, together with Dirk Pretorius, the requisite reporting. A short summary of these consultants is given below. CVs are available upon request.

Mr Andries van der Merwe, the Project Director, is appropriately qualified and registered with the relevant professional bodies. Mr van der Merwe is a professionally registered Environmental Engineer registered with the Engineering Council of South Africa (Pr. Eng.) and holds a B. Eng. (Civil) degree. Mr van der Merwe has over 14 years' experience in the field of impact assessment

Ms Franci Gresse*, the Project Leader,* is a Senior Environmental Practitioner in the Cape Town Office with eight years' experience in the field. She completed a Bachelor of Science and Honours Degree in Conservation Ecology at the University of Stellenbosch. Ms Gresse has been involved in a variety of projects, including a 24G application, basic and full EIAs, environmental management plans, maintenance management plans, wetland rehabilitation plans and pre-feasibility and feasibility studies. Specifically, Ms Gresse has been involved with numerous renewable energy projects in South Africa and Namibia, as well as water related projects such as the national Working for Wetlands Rehabilitation Programme. She has also been involved with the proposed expansion of the Kriel Ash Disposal Facility project since 2009.

Mr Dirk Pretorius, one of the project staff, is a Senior Environmental Practitioner at Aurecon's Cape Town office with six years' experience in the field. Mr Pretorius is register as a Professional Natural Scientist at the Natural Scientific Professions Act, 2003 (Act 27 of 2003) and has a Bachelor of Science (Honours) degree in Conservation Ecology. He has been involved in a number of energy projects in the Western, Eastern and Northern Cape provinces of South Africa as well as several energy related projects in East Africa.

7 CONCLUSIONS AND WAY FORWARD

The purpose of this Chapter is to summarise and conclude the Scoping Report and describe the way forward.

7.1 Conclusions

As per the requirements of NEMA, this Scoping investigation has reviewed a range of project alternatives and contemplated the array of potential environmental impacts associated with the following proposed activities in Mpumalanga:

- Construction of an Ash Disposal Facility that would have sufficient capacity for the remaining operational life of the power station until 2039 plus a five year contingency.
- Associated infrastructure that would also be established includes the following:
  - An Ash Disposal Facility that would have sufficient capacity to store ash volumes produced to 2045;
  - An AWR dam from where decant and drained water will be pumped back to the power station for re-use;
  - An AWR transfer dam;
  - Delivery and return infrastructure, including conveyor belts and/ or pipelines, transfer houses, pump stations;
  - Clean and dirty water channels;
  - Powerlines; and
  - Access roads.

The following preferred alternatives will be consideration in the EIR against the "No-go" alternative:

- Activity alternatives:
  - Wet ashing.
- Location alternatives
  - Site 10 for the proposed Ash Disposal Facility and associated conveyor system alignments.
- Site layout alternatives:
  - Ash Dam 4.1 and 4.2.One layout for Site 10 ashing facility and associated infrastructure.
- No-go alternative (NEMA requirement against which all alternative should be measured)

Specifically the following potential environmental impacts have been identified for further consideration in the EIR:

- Construction phase impacts on the biophysical and social environments:
  - Disturbance of flora and fauna;
  - Sedimentation and erosion of water ways;
  - Increase in traffic volumes;
  - Disposal of hazardous substances on site;
  - Increased risk of fire;
  - Pollution (noise, air and water); and
  - Dust impacts.
- Operational phase impacts on the biophysical environment:
  - Impact on the terrestrial fauna and flora;
  - Impact on aquatic flora and fauna;
  - Impact on groundwater resources; and
  - Impact on air quality.
- Operational phase impacts on the social environment:
  - Visual impacts;

- Impact on heritage resources;
- Noise impacts;
- Impact on the local economy;
- Impact on agriculture and other land uses in the study area;
- Impact on traffic;
- Impact on existing infrastructure and services; and
- Impact on health and safety of workers and others in the area.

The following specialist studies and specialists will be commissioned to provide more detailed information on those environmental impacts which have been identified as potentially being of most concern, and/or where insufficient information is available, namely:

Study	Consultant and Organisation
Terrestrial ecology assessment	Dr Brian Colloty, Scherman Colloty and Associates
Aquatic ecology assessment	Dr Brian Colloty & Dr Patsy Sherman, Scherman Colloty and Associates
Groundwater assessment	Mr Louis Stroebel, Aurecon
Air quality impact assessment	Ms Renee von Gruenewaldt, Airshed Planning Professionals
Visual impact assessment	Mr Johan Goosen, Aurecon
Heritage impact assessment	Mr Polke Birkholtz, Professional Grave Solutions: Heritage Unit
Noise impact assessment	Mr Derek Cosijn, Jongens Keet Associates
Agricultural / Land capability and economic impact assessment	Mr Paul Vermaak, Sole Proprietor & Mr F Botha, Eco-Soils
Traffic impact assessment	Dr Werner Heyns, Aurecon

The rationale for these specialist investigations and the ToR has been outlined under the PoS for EIA in **Chapter 6** of this report.

7.2 The way forward

Following the 30-day period (i.e. until 28 November 2016) in which I&APs are afforded an opportunity to submit comment on the Scoping Report to Aurecon, the scoping report will be updated incorporating all comments. The SR and comments will be submitted to the DEA for their consideration. DEA will either reject the report or instruct the applicant to proceed to the EIA Phase, either as proposed in the Plan of Study for EIR, or direct that amendments are made before continuing. All registered I&APs will be kept informed throughout the EIA process of

8 REFERENCES

8.1 General references

Airshed Planning Professionals. 2010. Air Quality Baseline Assessment for the Kriel Ash dam. Report No.: APP/09/AUR/05 Rev1.

Aurecon South Africa. 2010. Baseline Geohydrology for the EIA – Kriel Ash Dam Extension. Report No.: 105719-V1.1-2010.

Buchan, I.F., Baars, L.F. and Northcote, C.S. 1980. Opencast coal mining at Kriel Colliery. Journal of the South African Institute of Mining and Metallurgy.

DEA&DP. 2009. Draft Guideline on Alternatives, NEMA EIA Regulations Guideline and Information Document Series. Western Cape Department of Environmental Affairs& Development Planning. Unpublished.

DEA&DP. 2009. Draft Guideline on Public Participation, NEMA EIA Regulations Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning. Unpublished.

DEA&DP. 2009. Draft Guideline on Need and Desirability, NEMA EIA Regulations Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning. Unpublished.

DEA&DP. 2010. Guideline on Alternatives, EIA Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning (DEA&DP), Cape Town.

DEAT. 2002. Integrated Environmental Information Management, Information Series 2: Scoping. DEAT, Pretoria.

DEAT. 2002. Integrated Environmental Information Management, Information Series 3: Stakeholder Engagement. DEAT, Pretoria.

DEAT. 2002. Integrated Environmental Information Management, Information Series 4: Specialist Studies. DEAT, Pretoria.

DEAT. 2004. Integrated Environmental Management, Information Series 11: Criteria for determining Alternatives in EIA.DEAT, Pretoria.

DEAT. 2004. Integrated Environmental Information Management, Information Series 12: Environmental Management Plans. DEAT, Pretoria.

DEAT. 2005. Integrated Environmental Management Guideline Series, Guideline 3: General Guide to the Environmental Impact Assessment Regulations. Unpublished.

DEAT. 2005. Integrated Environmental Management Guideline Series, Guideline 4: Public Participation, in support of the EIA Regulations. Unpublished.

DEAT. 2007. Integrated Environmental Management Guideline Series, Guideline 7: Detailed Guide to Implementation of the Environmental Impact Assessment Regulations. Unpublished.

Emalahleni LM. 2009. Emalahleni Local Municipality Integrated Development Plan for 2009/10.

Emalahleni LM. 2009. Emalahleni Local Municipality Spatial Development Framework.

Eskom, Primary Energy Division: Water. 2010. Kriel Power Station Integrated Water Use Licence Application.

Ferrar, A.A. and Lötter, M.C. 2007. Mpumalanga Biodiversity Conservation Plan Handbook. Mpumalanga Tourism & Parks Agency, Nelspruit.

Jones and Wagener Consulting Civil Engineers. 2004. Kriel Power Station: Ash Dam 4 Interim Geotechnical Report.

Jones and Wagener Consulting Civil Engineers. 2006. Kriel Power Station: Ash Dam Feasibility Investigation.

Jones and Wagener Consulting Civil Engineers. 2010. Kriel Ash Dam Environmental Impact assessment: Site Selection Inputs. Report No.: JW71/10/A407 – Rev B.

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

Nkangala District Municipality. 2009. IDP 2009/10

Professional Grave Solutions. 2010. Heritage Desktop Study on Three Possible Sites for the Proposed Ash Dam Facility at the Kriel Power Station. Report No.: AUR-KAD-HDS-1.

Roschcon (Pty) Ltd. 2008. Kriel Power Station: Ash Dam Complex Remaining and Extended Capacity of Ash Dams.

Scherman Colloty & Associates cc. 2010. Eskom Kriel Power Station Aquatic and Terrestrial Ecological Assessment: Desktop Site Description. Draft Report V2.

Strydom, H.A. and King, N.D. (eds.). 2009. Environmental Management in South Africa (2nd Edition). Juta, Cape Town.

8.2 Electronic resources

Eskom - Kriel Power Station: http://www.eskom.co.za/live/content.php?Item_ID=177 (accessed 16/03/2010)

Mpumalanga Provincial Government Department of Agriculture and Land Administration (DALA): http://www.mpu.agric.za/Web/index.htm (accessed 21/04/2010)

South African National Botanical Institute BGIS: http://bgis.sanbi.org/index.asp?screenwidth=1280 (accessed 21/04/2010)

http://www.thefreedictionary.com/supernatant(accessed in November 2010)

http://www.steinmuller.co.za/index.php/sm/company/company_history(accessed in November 2010)

Annexure A

Annexure A.1

Details of the expertise of the EAP, including a curriculum vitae

Annexure A.2

Application form, including EAP affirmation

Annexure B

Annexure B.1

Process followed to reach the proposed preferred activity, site and location

Annexure C

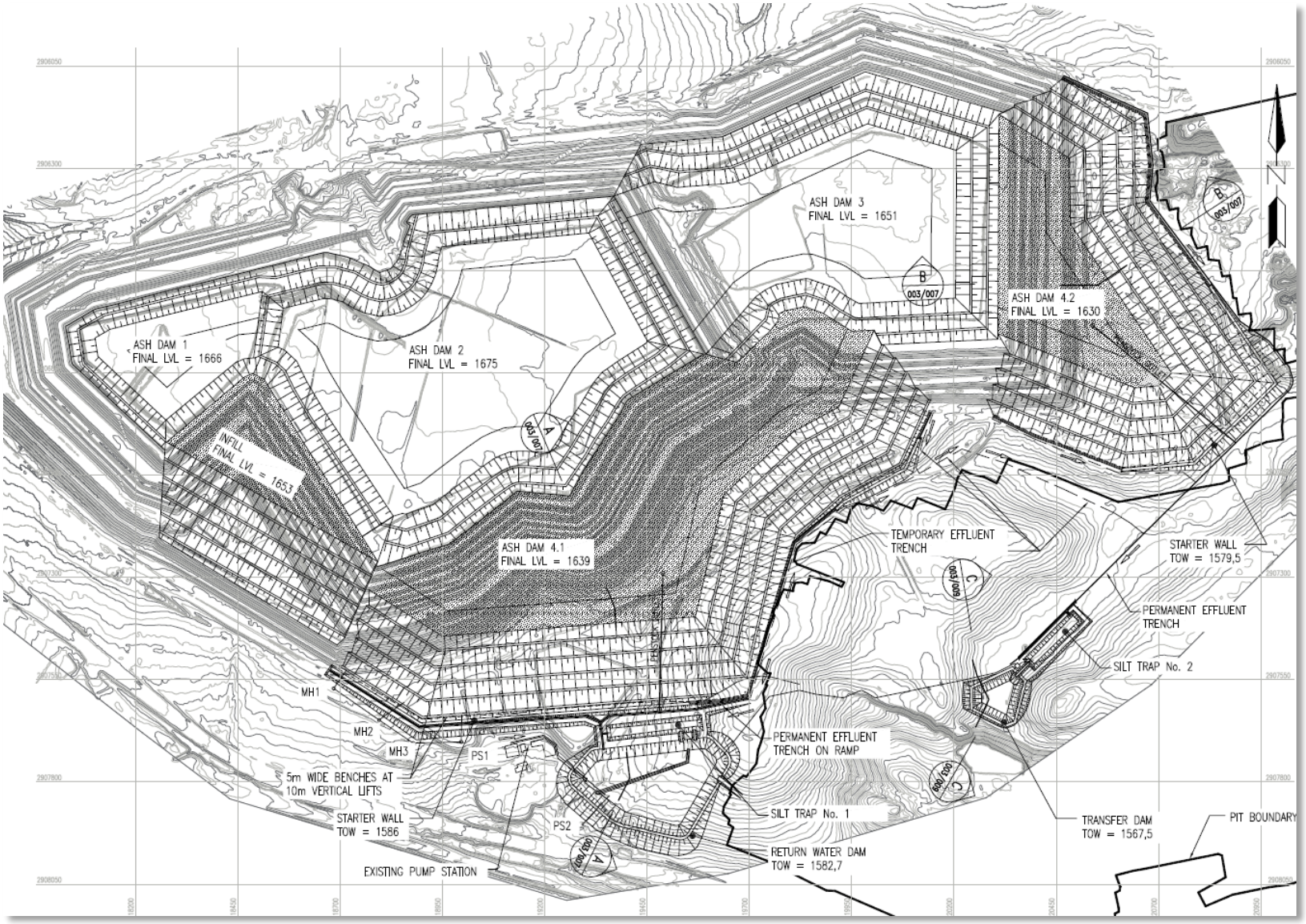
Annexure C.1

2010 Site selection process

Annexure D

Annexure D.1

Ash Dam 4 Concept 2016 preferred alternative, consisting of only AD 4.1 and 4.2


ASH DAM 1
FINAL LVL = 1666
ASH DAM 2
FINAL LVL = 1675
ASH DAM 3
FINAL LVL = 1651
ASH DAM 4.2
FINAL LVL = 1630
INFILL
FINAL LVL = 1653
ASH DAM 4.1
FINAL LVL = 1639
TEMPORARY EFFLUENT
TRENCH
STARTER WALL
TOW = 1579,5
PERMANENT EFFLUENT
TRENCH
SILT TRAP No. 2
MH1
MH2
MH3
PS1
PS2
PERMANENT EFFLUENT
TRENCH ON RAMP
5m WIDE BENCHES AT
10m VERTICAL LIFTS
STARTER WALL
TOW = 1586
EXISTING PUMP STATION
SILT TRAP No. 1
RETURN WATER DAM
TOW = 1582,7
TRANSFER DAM
TOW = 1567,5
PIT BOUNDARY
N

Annexure E

Annexure E.1

List of potential I&APs

2011 Registered I&APs

TITLE	NAME / INITIAL	SURNAME	ORGANISATION / FARM NAME
Mr	Tobile	Bokwe	Eskom : Senior Environmental Advisor
Ms	Karen	Marx	WESSA (Northern Area): Regional Manager
Mr	PT	Mashiane	Emalahleni Local Municipality
Ms	Kim	Webb	WESSA (Northern Area): Conservation Coordinator: Mpumalanga
Ms	Margaret	Phatlane	Kriel Colliery (Community Development)
Mr	A.J. Dries	Cronje	Dries Cronje Broedary
Mr	Andre	Boshoff	Plaas Bakenlaagte
	J.H.	Jacobs	Bakenlaagte
	J.	Opperman	Nooitgedacht
Mr	Edmund M.	Muller	Vierfontein Boerdery
Mr	Phillip	Makgoka	Exxaro Matla mine
Mr	Maphuti	Boloka	Kriel Mine (Anglocoal)
	P J	Van Heerden	Kriel Colliery
	Nick	Bongers	Emalahleni Local Municipality
Ms	Mbali	Pewa	Kriel Mine (Anglocoal)
		Director	Emalahleni Local Municipality: Environmental Health
		Director	Emalahleni Local Municipality: Waste Management
	Marietjie	Wolmarans	Kriel Colliery (Training)
	Bhekithemba	Ndhala	Sibongamandla School
	Busi	Zulu	Total Coal SA
	Sanele	Mzuzu	SAPS
Ms	Fikile	Mokoena	Kriel Colliery (Communications)
	Mzimkhulu	Koyo	Matla Colliery
	Mbali	Nhlengethwa	Matla Power Station
	Johan	van der Walt	Kriel Mine (Anglocoal)
	Wilma	Schutte	Landowner
Dr	Garth	Batchelor	Mpumalanga Department of Agriculture and Land Administration: Director: Environmental Management
Mr	Peter	Lukey	Department of Environmental Affairs (DEA) :Chief Director: Air Quality and Climate Change
Mr	Mazwi	Lushaba	Department of Environmental Affairs (DEA) : Director: Air Quality Management
Ms	Nkosazana	Machete	South African Heritage Resource Agency (SAHRA) : Provincial Manager
Mr	Lebogang	Mofokeng	Department of Agriculture and Land Administration
Mr	Musa	Mondlane	Mpumalanga Department of Agriculture and Land Administration :Director: Environmental Management
Mr	Dumisane	Mthembu	Department of Environmental Affairs (DEA) : Deputy Director: Environmental Impact Evaluation
Mr	Kelello	Ntoampe	Department of Environmental Affairs: Authorisations and Waste Stream Management,
Mr	Mohau	Ramodibe	Economic Development, Environment and Tourism

Mr	Izak	van der Merwe	Department of Water Affairs (DWA)
	Alucia	Mogale	DWA (Bronkhorspruit Office)
	Selby	Luckele	DEDET (Nelspruit)
	Khurisani	Mashava	DWA (Nelspruit)
	Mahadi	Mofokeng	DWA (Pretoria)
	Dash	Mabena	DEDET (Delmas)
Mr	F	Mntambo	Department of Water Affairs (DWA): Chief Director
Cllr	SK	Mashilo	Nkangala District Municipality
	Cynthia	Bongweni	Phumelela HBC
Mr	Naas	Boshoff	Plaas Bakenlaagte
Ms	Dolly	Mthethwa	
Mr	Moosa	Jogee	
	I.M.P.	van Niekerk	Vaal Pan Kriel
	A.J.	van Niekerk	Vaal Pan Kriel
Ms	Nomusa	Shili	Emalahleni Local Municipality
Clr	Z.Z	Bovungane	
Mr	Owen	Muller	Vierfontein Boerdery
Mr	Jeffrey	Skhosana	Ward 26
	Owen	Muller	Vierfontein Boerdery
	Edmund Jnr	Muller	Vierfontein Boerdery
	Andries	van Niekerk	
Clr	TH	Mavuso	Kriel Municipality
Mr	Wilson	Mamwara	Matla Coal

Authorities identified

TITLE	NAME/INITIALS	SURNAME	ORGANISATION/FARM NAME
Mr	MC	Theledi	Mpumalanga Department of Economic Development, Environment and Tourism
Ms	S	Masoka	Mpumalanga Department of Agriculture and Rural Development and Land Administration
Dr	Thulie	Khumalo	Department of Environmental Affairs (DEA): Climate Change and Air Quality
Mr	O	Baloyi	Department of Environmental Affairs (DEA): Chemical and Waste Management
Mr	Sabelo	Malanza	Department of Environmental Affairs (DEA): Legal Authorisations and Compliance Inspectorate
Mr	M	Mulaudzi	Mpumalanga Department of Water and Sanitation
Mr	Sifiso	Mkhize	Department of Water and Sanitation (DWS)
Mr	Benjamin	Moduka	South Africa Heritage Resource Agency (SAHRA) Mpumalanga Provincial Office
Cllr	SK	Mashilo	Nkangala District Municipality
Mr	PT	Mashaine	Emalahleni Local Municipality
	Matsemela	Moloi	Mpumalanga Department of Public Works, Roads and Transport
		Director	Nkangala Department of Health
		Director	National Energy Regulator of South Africa
Mr	MM	Mlengana	Department of Agriculture, Forestry and fisheries
Ms	Caroline	Khoza	Department of Transport
		Director	Department of Mineral Resources
		Director	South African National Road Agency Limited
		Director	South African Heritage Resources Agency
Ms	Matsidiso	Ogbobo	Civil Aviation Authority
		Director	Department of Energy (Mpumalanga regional Energy director)

Landowner

The applicant Eskom SOC limited (also see below correspondents).

TITLE	NAME/INITIALS	SURNAME	ORGANISATION/FARM NAME
Mr	Tobile	Bokwe	Eskom : Senior Environmental Advisor
Mr	Tinkie	Holl	Eskom Real Estate

Adjacent landowners

TITLE	NAME/INITIALS	SURNAME
Mr	Tobile	Bokwe
	Director	Anglo Operations Ltd
Mr	G.J.	Claassen
Mr	A.J.	van Niekerk
Mr	Ngangasi	Joseph Mahlangu

Annexure E.2

Proof of public participation

Proof of public participation will be included in final scoping report.

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

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

PO Box 494
Cape Town 8000
South Africa

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