9 IMPACT ASSESSMENT

9.1 Introduction

The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise as a result of the proposed project. The process of assessing the impacts of the project encompasses the following four activities:

- Identification and assessment of potential impacts;
- Prediction of the nature, extent, duration, magnitude and probability of potentially significant impacts;
- Identification of mitigation measures that could be implemented to reduce the severity or significance of the impacts of the activity; and
- Evaluation of the significance of the impact after the mitigation measures have been implemented i.e. the significance of the residual impact.

The possible impacts associated with the proposed new dry ash disposal facility at the Tutuka Power Station were primarily identified in the Scoping Phase through desktop study and public consultation. Additional impacts have further been identified and assessed during the Impact Assessment Phase by means of more in-depth investigations along with consultation with interested and affected parties.

9.2 EIA process and methodology

In accordance with Government Notice R. 543, promulgated in terms of section 24 of the National Environmental Management Act, 1998 (Act 107 of 1998), specialists were required to assess the significance of potential impacts in terms of the following criteria:

- Nature of the impact;
- Extent of the impact;
- Intensity of the impact;
- Duration of the impact;
- · Probability of the impact occurring;
- Impact non-reversibility;
- Cumulative impacts;
- Impact on irreplaceable resources; and
- Confidence level.

Issues were assessed in terms of the following criteria:

- The nature, a description of what causes the effect, what will be affected and how it will be affected;
- The physical **extent**, wherein it is indicated whether:
 - 1 the impact will be limited to the site;
 - 2 the impact will be limited to the local area;

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

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

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

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

Points	Significant Weighting	Discussion
< 30 points	Low	where this impact would not have a direct
< 30 points	LOW	influence on the decision to develop in the area
		where the impact could influence the decision to
31-60 points	Medium	develop in the area unless it is effectively
		mitigated
> 60 noints	High	where the impact must have an influence on the
> 60 points	High	decision process to develop in the area

The findings of the impact assessment have been consolidated into **Table 9.1** to **Table 9.8** below. The impacts are classified in terms of the phase of the development in which they are likely to occur, namely construction phase (**Table 9.1**), operational phase (**Table 9.2**), decommissioning phase (**Tables 9.3**) and the cumulative impacts (**Table 9.4**). (**Tables 9.5 – 9.8**) is a summary of the results.

Table 9.1: Detailed assessment of identified impacts for the Construction Phase – Dry ash disposal facility

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signific	cance	Status	Confidenc				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or -ve)	е				
GEOLOGY													
	Ash disposal facility – All Sites												
	Nature of impact:	Construction re procedures.	ruction related earthworks may impact the local geology if not undertaken in accordance to relevant dures.										
	with mitigation	1	3	2	2	12	Low	Neutral	High				
Impact 1: Construction- related earthworks	without mitigation	2	5	4	4	44	Medium	-	High				
	degree to which impact can be reversed:	Low	ow										
	degree of impact on irreplaceable resources:	Low		High									
Impact 2:	Nature of impact:	can be kept to a	Spillages and leaks from fuels, oil and other potentially hazardous substances during handling, use and storage can be kept to a minimum by applying a good housekeeping approach and observing and implementing the relevant mitigation measures.										
geological	with mitigation	1	1	2	2	8	Low	Neutral	High				
features in case of spillage or	without mitigation	3	4	6	3	39	Medium	-	High				
leakage of hydrocarbon and other	degree to which impact can be reversed:	Low	Low										
hazardous material	degree of impact on irreplaceable resources:	Low	Low										
AGRICULT	AGRICULTURAL POTENTIAL												
Ash Disposal Facility - Alternative A													
Potential	Mitigation	Extent	Duration	Magnitude	Probability	Signific	cance	Status	Confidence				

Potential		Extent	Duration	Magnitude	Probabili ty	Sign	ificance	Status	Confidenc			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	-D+M)*P)	(+ve or -ve)	е			
Impact		(E)	(D)	(M)	(P)	(S=(E-	+D+M)*P)	(+ve or - ve)				
	Nature of impact:		Unavaila	bility of soil res	source for agr	culture due to	positioning of AD	F				
	without	1	5	10	5	80	High	-	Confident			
	with	1	5	10	5	80	High					
Loss of agricultural soil	degree to which impact can be reversed:	Impo	Impossible to reverse as soils will be completely and permanently covered by ADF									
	degree of impact on irreplaceable resources: Absence of high potential soils means that there will not be a large-scale loss of irreplaceable resources within the local soil pattern.											
		Asl	n Disposal I	Facility - A	lternative	В						
Potential		Extent	Duration	Magnitude	Probability	Sigr	ificance	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or - ve)	Confidence			
	Nature of impact:		Unavaila	bility of soil res	source for agr	culture due to	positioning of AD)F				
	without	1	5	10	5	80	High	-	Confident			
	with	1	5	10	5	80	High					
Loss of agricultural soil	degree to which impact can be reversed:	Impo	ssible to reverse	e as soils will be	completely a	nd permanentl	y covered by ADF					
	degree of impact on irreplaceable resources:	Very proba	Very probable absence of high potential soils means that there will not be a large-scale loss of irreplaceable resources within the local soil pattern.									

Potential	Misicosion	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	·D+M)*P)	(+ve or -ve)	е	
		Ash	Disposal I	acility - A	lternative	C				
Potential		Extent	Duration	Magnitude	Probability	Significance		Status		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E-	+D+M)*P)	(+ve or - ve)	Confidence	
	Nature of impact:		Unavaila	bility of soil res	ource for agri	culture due to	positioning of AD)F		
	without	1	5	10	5	80	High	-	Confident	
	with	1	5	10	5	80	High			
Loss of agricultural soil	degree to which impact can be reversed:	Impossible to reverse as soils will be completely and permanently covered by ADF								
	degree of impact on irreplaceable resources:	Very probak		igh potential so ceable resourc			be a large-scale l n.	loss of		
GROUND V	NATER									
		Ash	Disposal Fa	acility - All	alternati	ves				
Potential		Extent	Duration	Magnitude	Probability	Sign	ificance	Status		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E-	+D+M)*P)	(+ve or - ve)	Confidence	
Deterioration of groundwater	Nature of impact:	Spillages of hyd impact on the q	, ,	•	•	ollutants durin	g the constructio	n phase may	/ have an	
quality due to spillages during	Without Mitigations	2	2	6	2	20	Low	-	High	
construction	With Mitigation	1	1	4	1	6	Low	-	High	

Potential	Mikingkian	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	·D+M)*P)	(+ve or -ve)	е		
	Degree to which impact can be reversed:	impact is difficu However, if apprefuelling and f	ult and expensive propriate precau	e - i.e. the degro tions are taken s, control of all	ee to which th during the co	e impact can b	wnwards, reversing e reversed is low. se (e.g. the bundinces at the site), the	ing of	High		
	Degree of impact on irreplaceable resources:	ı	Impact likely to be on local groundwater only, which is not irreplaceable.								
SURFACE	WATER										
		Ash	n Disposal F	acility - Al	ternative	Α					
Potential		Extent	Duration	Magnitude	Probability	Significance (S=(E+D+M)*P)		Status			
Impact	Mitigation	(E)	(D)	(M)	(P)			(+ve or - ve)	Confidence		
	Nature of impact:	Clea	ring of vegetatio	on result in decr	ease surface r	oughness and	change in runoff o	characterist	ics		
	without	2	2	2	5	30	Low	-	3		
Impacts on	with	2	2	2	3	18	Low	-	3		
hydrology	degree to which impact can be reversed:	Impact is not readily reversed									

Potential		Extent	Duration	Magnitude	Probabili ty	Sign	ificance	Status	Confidenc	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	-D+M)*P)	(+ve or -ve)	e	
	degree of impact on irreplaceable resources:				Low				3	
	Nature of impact:	sediment loa	ids within the do	ownslope wetlar lous substances	nds, as well as on site. Inco	through pollu	will result as a cortants derived fron nagement and disionation.	n spillage, le	eakage and	
Impacts on	without	3	2	2	4	28	Low	-	3	
surface water	with	2	2	2	3	18	Low	-	3	
quality	degree to which impact can be reversed:	This impact is difficult to reverse at it has far reaching implications. Even once water constituents return back to background levels, subsequent biological responses might take much longer to recover.								
	degree of impact on irreplaceable resources:	Low								
Impacts related to erosion and sedimentation	Nature of impact:	risk. Use of he preferential likely. Remove and water (frowithin these highest during	of soil surfaces we eavy machinery of flow paths to sur al of vegetation m surface run-or wetlands and lea the summer mo	will increase the on site is also like face run-off. Co and the disturb ff). Eroded soil is ading to change on this when high the fairly resistant.	volumes and rely to result in centrated so ance of the so il likely to ento in tensity storintensity	velocities of sun the formation urface run-off will even downstream n composition rm events are left.	nificantly increase urface run-off, furt n of well-worn tra will lead to erosion expose the soils to n wetland areas, in and aquatic fauna ikely to result in s ed state, once dist	ther increas ocks and rut on, with gully erosion by ncreasing se a. Erosion is ignificant su	ing erosion s that act as r formation wind (dust) dimentation likely to be irface runoff.	

Potential		Extent	Duration	Magnitude	Probabili ty	Sign	ificance	Status	Confidenc		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	-D+M)*P)	(+ve or -ve)	е		
	without	2	2	2	4	24	Low	-	3		
	with	1	1	2	3	12	Low	-	3		
	degree to which impact can be reversed:Loss in direct wetland integrity and functioning due to erosion cannot be reversed easily. Loss due to downslope sedimentation might be easier to reinstate or might recover spontaneously provided 										
	degree of impact on irreplaceable resources:				Low				3		
Impacts on wetland	Nature of impact:	of the we In additior	tlands, while indi to the loss of w ts are likely to be	rect negative in wetlands thro etland habitat, e substantially o	npacts will als ugh altered flowetland habit wetland habit isturbed durin	o accrue to the ow volumes ar at located imm ng the construe	versity associate e downstream re nd quality. nediately adjacen ction process thre d people on site.	aches of the	affected elopment		
vegetation and	without	4	3	2	5	45	Medium	-			
disturbance of	with	4	3	2	5	45	Medium	-			
wetland habitat	degree to which impact can be reversed:	Wetland loss will be permanent.									
	degree of impact on irreplaceable resources:				Low.						
Impact related to increase alien/pioneer	Nature of impact:			•	• •	and likely to i	by alien and ween ncrease, to the d	•	•		

Potential	Minimanian	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)	е		
vegetation in	without	2	2	2	4	24	Low	-	3		
disturbed areas	with	1	2	2	3	15	Low	-	3		
	degree to which impact can be reversed:			Са	n be reversed						
	degree of impact on irreplaceable Low resources:										
	Nature of impact:	Loss in we	Loss in wetland habitat, and flow maintenance will result in a decrease in ecosystem services associoned wetlands								
	without	3	2	6	4	44	Medium	-	3		
Impacts on	with	3	2	6	4	44	Medium	-	3		
residual wetland ecosystem services	degree to which impact can be reversed:	Without reinstating impaired/impacted wetlands- ecosystem services can not be regained									
Services	degree of impact on irreplaceable resources:	Moderate									
		As	h Disposal F	acility - A	lternative	В					
Potential		Extent	Duration	Magnitude	Probability	Sign	ificance	Status			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	-D+M)*P)	(+ve or - ve)	Confidence		
	Nature of impact:	Clea	aring of vegetatio	n result in decr	ease surface r	oughness and	change in runoff	characterist	ics		
Impacts on hydrology	without	2	2	8	5	60	Medium	-	3		
Tiyarology	with	2	2	8	4	48	Medium	-	3		

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Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)	е			
	degree to which impact can be reversed:			Impact is r	not readily rev	versed			3			
	degree of impact on irreplaceable resources:		Low									
	Nature of impact:	sediment loa	uring the construction phase of the project, water quality deterioration will result as a consequence of incre ediment loads within the downslope wetlands, as well as through pollutants derived from spillage, leakage incorrect disposal of hazardous substances on site. Incorrect waste management and disposal is also likely contribute further to water quality deterioration.									
Impacts on	without	4	2	8	5	70	High	-	3			
surface water	with	4	2	8	4	56	Medium	-	3			
quality	degree to which impact can be reversed:	This impact is difficult to reverse at it has far reaching implications. Even once water constituents return back to background levels, subsequent biological responses might take much longer to recover.										
	degree of impact on irreplaceable resources:				Low				3			
Impacts related to erosion and sedimentation	Nature of impact:	compaction of risk. Use of he preferential likely. Remove and water (frowithin these	of soil surfaces veavy machinery flow paths to sural of vegetation m surface run-owetlands and le	vill increase the on site is also lik rface run-off. Co and the disturb ff). Eroded soil i ading to change	volumes and rely to result in the solution of	velocities of su n the formation urface run-off voll bil profile will e er downstream n composition	nificantly increase rface run-off, furi n of well-worn tra vill lead to erosio xpose the soils to n wetland areas, in and aquatic fauna kely to result in s	ther increas acks and rut: n, with gully erosion by ncreasing se a. Erosion is	ing erosion s that act as r formation wind (dust) dimentation likely to be			

Potential	Mikingking	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)	е			
		While the ve	significant erosion risk.									
	without	3	2	8	5	65	High	-	3			
	with	2	2	8	4	48	Medium	-	3			
	degree to which impact can be reversed:		Loss in direct wetland integrity and functioning due to erosion cannot be reversed easily. Loss due to downslope sedimentation might be easier to reinstate or might recover spontaneously provided sediment sources are stopped.									
	degree of impact on irreplaceable resources:				Low				3			
Impacts on wetland vegetation and disturbance of	Nature of impact:	of the we	tlands, while indi to the loss of we ts are likely to be	rect negative in wetlands thro etland habitat, e substantially o	npacts will als ugh altered flowetland habit wetland habit listurbed durin	o accrue to the ow volumes an at located imm ng the construc	versity associated downstream read quality. ediately adjacent tion process thro people on site.	ches of the	affected elopment			
wetland habitat without 4 2 8 5 70 High -								3				
	with	4	2	8	4	56	Medium	-	3			

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	·D+M)*P)	(+ve or -ve)	е	
	degree to which impact can be reversed:			Wetland los	ss will be perr	manent.			3	
	degree of impact on irreplaceable resources:				Low.				3	
	Nature of impact:			·	• •	and likely to ir	by alien and wee ncrease, to the de	•	•	
Impact related	without	3	2	6	4	44	Medium	-	3	
to increase	with	2	2	6	3	30	Low	-	3	
alien/pioneer vegetation in disturbed areas	degree to which impact can be reversed:	Can be reversed								
	degree of impact on irreplaceable resources:				Low				3	
Impacts on	Nature of impact:	Loss in wet	land habitat, an	d flow maintena	nce will resu wetla		in ecosystem ser	vices associa	ated with	
residual	without	4	2	8	5	70	High	-	3	
wetland	with	4	2	8	4	56	Medium	-	3	
ecosystem services	degree to which impact can be reversed:	Without reinstating impaired/impacted wetlands- ecosystem services cannot be regained								

Potential	Militaria	Extent	Duration	Magnitude	Probabili ty	Significance	Status	Confidenc				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or -ve)	е				
	degree of impact on irreplaceable resources:				Moderate			3				
	Ash Disposal Facility - Alternative C											
Potential	Potential Extent Duration Magnitude Probability Significance Status											
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or - ve)	Confidence				
	Nature of impact:	Clea	Clearing of vegetation result in decrease surface roughness and change in runoff characteristics									
	without	3	2	6	5	55 Medium	-	3				
	with	2	2	6	4	40 Medium	-	3				
Impacts on hydrology	degree to which impact can be reversed:	Impact is not readily reversed										
	degree of impact on irreplaceable resources:		Low									
Impacts on surface water quality	Nature of impact:	sediment lo	ads within the do	wnslope wetla lous substances	nds, as well as s on site. Incor	deterioration will result as a through pollutants derived f rect waste management and r quality deterioration.	rom spillage, l	eakage and				
	without	4	2	6	5	60 Medium	-	3				
	with	3	2	6	4	44 Medium	-	3				

Potential	Militarian	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)	е
	degree to which impact can be reversed:	•			• •		once water const ike much longer t		3
	degree of impact on irreplaceable resources:	Clearing of	vegetation resul	t in decrease su	rface roughne	ess and change	in runoff charact	eristics	3
Impacts related to erosion and	Nature of impact:	compaction risk. Use of he preferential likely. Remov and water (fro within these highest during	of soil surfaces we eavy machinery of flow paths to surval of vegetation om surface run-owetlands and lead the summer mo	will increase the on site is also like face run-off. Co and the disturb ff). Eroded soil is ading to change on this when high the fairly resistant.	volumes and sely to result in centrated so ance of the so il likely to ent in vegetation intensity store	velocities of sur in the formation urface run-off woil profile will ex er downstream in composition a im events are li the undisturbe	nificantly increase rface run-off, furt n of well-worn tra vill lead to erosion xpose the soils to wetland areas, in and aquatic fauna kely to result in s d state, once dist	ther increas ticks and rute n, with gully erosion by ncreasing se a. Erosion is ignificant su	ing erosion s that act as r formation wind (dust) dimentation likely to be urface runoff.
sedimentation	without	3	2	6	5	55	Medium	-	3
	with	3	2	6	4	44	Medium	-	3
	degree to which impact can be reversed:		.	night be easier t	_	might recover	eversed easily. Lo spontaneously pi		3
	degree of impact on irreplaceable resources:				Low				3

Potential		Extent Duration Magnitude Probabili ty Significance Status										
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)	e			
	Nature of impact:	of the we	tlands, while indi to the loss of we ts are likely to be	rect negative in wetlands thro etland habitat, v e substantially d	npacts will als ugh altered fl wetland habit isturbed duri	o accrue to the ow volumes an at located imm ng the construc	versity associated downstream rea d quality. ediately adjacent tion process thro I people on site.	ches of the to the deve	affected elopment			
Impacts on	without	3	3 2 4 4 36 Medium -									
wetland vegetation and	with	2	2	4	2	16	Low	-	3			
disturbance of wetland habitat	degree to which impact can be reversed:		Wetland loss will be permanent.									
	degree of impact on irreplaceable resources:		Low.									
Impact related	Nature of impact:			•		and likely to ir	by alien and weed ncrease, to the de		•			
to increase	without	3	2	6	4	44	Medium	-	3			
alien/pioneer vegetation in	with	2	2	6	3	30	Low	-	3			
disturbed areas	degree to which impact can be reversed:	Can be reversed							3			

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signific	cance	Status	Confidenc		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or -ve)	е		
	degree of impact on irreplaceable resources:				Low				3		
	Nature of impact:	Loss in wet	land habitat, and	d flow maintena	ance will result wetlan		ecosystem ser	vices associa	ated with		
	without	4	2	4	3	30	Low	ı	3		
Impacts on	with	3	2	4	3	27	Low	-	3		
residual wetland ecosystem services	degree to which impact can be reversed:	Without	Without reinstating impaired/impacted wetlands- ecosystem services can not be regained								
Sel vices	degree of impact on irreplaceable resources:		Moderate								
BIODIVER	RSITY										
		As	h Disposal F	acility - A	ternative	A					
Detential		Extent	Duration	Magnitude	Probability	Signifi	cance	Status			
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)	Confidence		
Impacts on flora species of conservation importance	Nature of impact:	construction a	icludes direct impacts of development of the ashing facility on plants of conservation importance during construction and site preparation activities, such as soil disturbances and topsoil stripping. Also include impabitat that are associated with the presence of conservation important species, although not necessarily renthe site								
(including	without	4	5	10	4	76	High	-	High		
habitat suitable	with	4	5	10	3	57	Medium	=	High		

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Potential		Extent	Duration	Magnitude	Probabili tv	Signific	ance	Status	Confidenc			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	-M)*P)	(+ve or -ve)	е			
for these species)	degree to which impact can be reversed:	•	es and habitat s	suitable for thes		irreversible. Impa entirely destroy a			High			
	degree of impact on irreplaceable resources:		ese species are	•		itat for these spec s well as occurring			High			
Impacts on	Nature of impact:	construction an	d site preparati in habitat that	on activities, su are associated v	ch as acciden	y on animals of cor tal killing and, part ence of conservati	ticularly, habit	at destructi	on. Also			
fauna species of conservation	without	4	5	10	4	76	High	-				
importance	with	4	5	10	3	57	Medium	-				
(including habitat suitable for these	degree to which impact can be reversed:	created subsequ	Destruction of habitat and animals during the construction process is regarded irreversible. Habitat created subsequent to construction activities is regarded inadequate to satisfy habitat requirements of these species, also affecting migration patterns and movement corridors									
species)	degree of impact on irreplaceable resources:		s of suitable hab			the landscape pla ne status is not re			High			
Impacts on sensitive or	Nature of impact:		_	•	•	cal types that are to regards to the st	•	cted in distr	ibution and			
protected flora	without	3	5	10	4	72	High	-	High			
& fauna habitat	with	3	5	10	3	54	Medium	-				
types (including loss and degradation)	degree to which impact can be reversed:				• •	velopment is irrevo s functionality and	• •	•	High			

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signific	ance	Status	Confidenc			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	⊦M)*P)	(+ve or -ve)	e			
	degree of impact on irreplaceable resources:				_	· ·	level implies a loss of these important cal functionality on a larger scale ent areas of natural habitat, the presence					
	Nature of impact:	•	_	•		cent areas of natu ult in conflict situa		e presence o	of			
	without	2	5	6	5	65	High	-	High			
Displacement of	with	2	5	4	5	55	Medium	-	High			
fauna species, human-animal conflicts & interactions	degree to which impact can be reversed:		of impact generally not possible due to the severity of the development, mitigation can lly result in reduction of severity. Animals will grow accustomed to structures after a period									
mecraetions	degree of impact on irreplaceable resources:	Moderate, affected species might include animals of conservation importance										
	Nature of impact:	corridors. Effec	ctive ecological f	unctioning of th	ne habitat is a	nium on remaining Iso dependent on ion of movement	a minimum av	ailability of	natural			
Impacts on	without	3	5	6	5	70	High	-				
ecological	with	3	5	4	5	60	Medium	-				
connectivity and ecosystem functioning	degree to which impact can be reversed:	The severity of	the developmer	nt implies that t	he impact car	not be reversed			Medium			
	degree of impact on irreplaceable resources:		s of remaining habitat contributes to the loss of functionality on a landscape scale, therefore also olying impacts on surrounding areas									
	Notice of improve.	•		•		the above, as we	II as additiona	l impacts su	ch as habitat			
Indirect impacts on surrounding	Nature of impact:	degradation an	d deterioration	due to leaching,	<u>, effluents, du</u>	st, etc						

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Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signifi	cance	Status	Confidenc			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D)+M)*P)	(+ve or -ve)	е			
	with	3	4	4	5	55	Medium	-	Medium			
	degree to which impact can be reversed:	•	lementation of o	_		s could result in	reduction and		Medium			
	degree of impact on irreplaceable resources:	Moderate, imp	ortance of surro	ounding natural	habitat increa	ses with the loss	s of habitat fron	n the site	Medium			
		Ash Disposal Facility - Alternative B										
Potential		Extent										
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P) (+		(+ve or - ve)	Confidence			
Impacts on flora	Nature of impact:	construction ar	Includes direct impacts of development of the ashing facility on plants of conservation importance during construction and site preparation activities, such as soil disturbances and topsoil stripping. Also include in habitat that are associated with the presence of conservation important species, although not necessarily on the site.									
species of conservation	without	4	5	8	3	51	Medium	-	High			
importance	with	4	5	6	3	45	Medium	-	High			
(including habitat suitable for these	degree to which impact can be reversed:	important spec	•	suitable for the		eversible. Impac entirely destroy			High			
species)	degree of impact on irreplaceable resources:	significant as th	e loss of conservation important species and suitable habitat for these species is regarded inficant as these species are already limited in numbers as well as occurring in localised and legmented habitat									
Impacts on fauna species of conservation	Nature of impact:	construction ar	nd site preparati	on activities', s	uch as acciden	on animals of co tal killing and, pa nce of conserva	ion. Also					

Potential	M****	Extent	Duration	Magnitude	Probabili ty	Signific	ance	Status	Confidenc			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	+M)*P)	(+ve or -ve)	е			
importance		necessarily reco	rded on the site	2								
(including	without	4	5	8	3	51	Medium	-				
habitat suitable for these	with	4	5	6	3	45	Medium	-				
species)	degree to which impact can be reversed:		uent to construc	ction activities i	s regarded ina	process is regarde adequate to satisf ment corridors			High			
	degree of impact on irreplaceable resources:		of suitable hab			the landscape pla ne status is not re	•		High			
	Nature of impact:		_			cal types that are a n regards to the s	• •	cted in distr	ibution and			
Impacts on	without	3	5	8	3	48	Medium	-	High			
sensitive or	with	3	5	6	3	42	Medium	-				
protected flora & fauna habitat types (including loss and	degree to which impact can be reversed:		Destruction of sensitive habitat types during this type of development is irreversible. Stripping of copsoil will irreversibly affect the status of habitat, as well as functionality and species composition									
degradation)	degree of impact on irreplaceable resources:					l level implies a lo ical functionality	•		High			
Displacement of	Nature of impact:	•	•	•		cent areas of natu ult in conflict situa	· · · · · · · · · · · · · · · · · · ·	e presence o	of			
fauna species,	without	2	5	6	4	52	Medium	-	High			
human-animal	with	2	5	4	3	33	Medium	-	High			
conflicts & interactions	degree to which impact can be reversed:	•	•	•	•	of the developm accustomed to st	•		Medium			

Potential		Extent	Duration	Magnitude	Probabili ty	Signific	ance	Status	Confidenc		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D-	⊦M)*P)	(+ve or -ve)	е		
	degree of impact on irreplaceable resources:	Moderate, affe	cted species mig	tht include anim	nals of conser	vation importance	2		Medium		
	Nature of impact:	corridors. Effec	ctive ecological f	unctioning of th	ne habitat is a	nium on remaining Iso dependent on ion of movement	a minimum av	ailability of	natural		
Impacts on	without	3	5	6	4	56	Medium	-			
ecological	with	3	5	4	3	36	Medium	-			
connectivity and ecosystem functioning	degree to which impact can be reversed:	The severity of	severity of the development implies that the impact cannot be reversed								
	degree of impact on irreplaceable resources:		of remaining habitat contributes to the loss of functionality on a landscape scale, therefore also lying impacts on surrounding areas								
	Nature of impact:	•	rounding habitat d deterioration	•		the above, as we st, etc	ll as additiona	l impacts su	ch as habitat		
	without	3	5	6	5	70	High	-	High		
	with	3	4	4	4	44	Medium	-	Medium		
Indirect impacts on surrounding habitat	degree to which impact can be reversed:	•	lementation of c	_		es could result in r	eduction and		Medium		
	degree of impact on irreplaceable resources:	Moderate, imp	oderate, importance of surrounding natural habitat increases with the loss of habitat from the site								
		Asl	n Disposal F	acility - Al	ternative	С					
Potential	Mitigation	Extent	Duration	Magnitude	Probability	Signific	ance	Status	Confidence		

Potential		Extent	Duration	Magnitude	Probabili tv	Signifi	icance	Status	Confidenc	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D)+M)*P)	(+ve or -ve)	e	
Impact		(E)	(D)	(M)	(P)	(S=(E+D	D+M)*P)	(+ve or - ve)		
Impacts on flora	Nature of impact:	construction an	d site preparati	on activities', su	ıch as soil dist	on plants of cor urbances and to n important spe	psoil stripping.	Also include	impacts in	
species of conservation	without	4	5	10	4	76	High	-	High	
importance	with	4	5	8	3	51	Medium	-	High	
(including habitat suitable for these	degree to which impact can be reversed:	important spec		uitable for thes	_	eversible. Impac entirely destroy		High		
degree of impact on irreplaceable resources: The loss of conservation important species and suitable habitat for these species is regarded significant as these species are already limited in numbers as well as occurring in localised and fragmented habitat									High	
Impacts on	Nature of impact:	construction an include impacts	d site preparati	on activities', su are associated v	ich as acciden	on animals of cotal killing and, poince of conserva	articularly, habit	tat destruct	on. Also	
fauna species of conservation	without	4	5	10	4	76	High	-		
importance	with	4	5	8	3	51	Medium	-		
(including habitat suitable for these	degree to which impact can be reversed:	created subseq	Destruction of habitat and animals during the construction process is regarded irreversible. Habitat created subsequent to construction activities is regarded inadequate to satisfy habitat requirements of these species, also affecting migration patterns and movement corridors							
species)	degree of impact on irreplaceable resources:		s of suitable hab			the landscape pl ne status is not r			High	
Impacts on	Nature of impact:	Destruction or o	degradation of i	mnortant/ prot	acted acologic	al types that are	tunically roctri	atad : a diatu	bution and	

Potential	Minimalian	Extent	Duration	Magnitude	Probabili ty	Signific	cance	Status	Confidenc				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or -ve)	е				
sensitive or		also typically hi	gh in biodiversit	y. Wetlands a	re important i	n regards to the	study area						
protected flora	without	3	5	10	4	72	High	-	High				
& fauna habitat	with	3	5	8	3	48	Medium	-					
types (including loss and degradation)	degree to which impact can be reversed:		ruction of sensitive habitat types during this type of development is irreversible. Stripping of oil will irreversibly affect the status of habitat, as well as functionality and species composition										
	degree of impact on irreplaceable resources:	•	the restricted distribution on a local and regional level implies a loss of these important es affects the habitat directly, but also the ecological functionality on a larger scale										
	Nature of impact:	· ·	-	•	· ·	cent areas of nat ult in conflict situ		e presence o	of				
	without	2	2 5 6 5 65 High - H										
Displacement of	with	2	5	4	4	44	Medium	-	High				
fauna species, human-animal conflicts & interactions	degree to which impact can be reversed:	•	eversal of impact generally not possible due to the severity of the development, mitigation can otentially result in reduction of severity. Animals will grow accustomed to structures after a period										
interactions	degree of impact on irreplaceable resources:	Moderate, affec	erate, affected species might include animals of conservation importance Medium										
Impacts on ecological connectivity	Nature of impact:	corridors. Effec	tive ecological f	unctioning of th	ne habitat is a	ium on remainin lso dependent or ion of movemen	n a minimum av	ailability of	natural				
and ecosystem	without	3	5	6	5	70	High	-					
functioning	with	3	5	4	4	48	Medium	-					

Potential	M****	Extent	Duration	Magnitude	Probabili ty	Significa	ance	Status	Confidenc		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	·M)*P)	(+ve or -ve)	е		
	degree to which impact can be reversed:	The severity of	the developme	nt implies that t	he impact car	nnot be reversed			Medium		
	degree of impact on irreplaceable resources:		remaining habitat contributes to the loss of functionality on a landscape scale, therefore also g impacts on surrounding areas on surrounding habitat can potentially include all of the above, as well as additional impacts suc								
	Nature of impact:	•		t can potentially due to leaching,			l as additional	impacts su	ch as habitat		
	without	3	5	6	5	70	High	-	High		
	with	3	4	4	4	44	Medium	-	Medium		
Indirect impacts on surrounding habitat	degree to which impact can be reversed:		rate, implementation of dedicated mitigation measures could result in reduction and nment of impacts to the development site								
	degree of impact on irreplaceable resources:	Moderate, imp	oderate, importance of surrounding natural habitat increases with the loss of habitat from the site								

AVIFAUNA

	Ash Disposal Facility - Alternative A											
Potential		Extent	Duration	Magnitude	Probability	Sign	ificance	Status				
Impact Mitigation		(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or - ve)	Confidence			
	Nature of impact:	Noise and move	ment, from staf	f and machine	ry, may disturk	avifauna, and	nests may be dis	turbed.				
Disturbance	without	2	4	6	4	48	Medium		Medium			
	with	2	4	4	3	30	Low		Medium			

Potential	Mitimation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)	е			
	degree to which impact can be reversed:			Part	ially reversible							
	degree of impact on irreplaceable resources:		Low									
	Nature of impact:	Permanent rem	manent removal of habitat that is used, or may be used, by avifauna.									
	without	1	5	6	5	60	Medium		Medium			
	with	1	5	6	5	60	Medium		Medium			
Habitat Destruction	degree to which impact can be reversed:	Irreversible										
	degree of impact on irreplaceable resources:	Medium										
		Ash	Disposal F	acility - A	ternative	В						
Potential		Extent	Duration	Magnitude	Probability	Sign	ificance	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	-D+M)*P)	(+ve or - ve)	Confidence			
	Nature of impact:	Noise and move	ement, from sta	ff and machine	ry, may disturl	o avifauna, and	nests my be dist	urbed.				
	without	2	4	6	4	48	Medium		Medium			
Disturbance	with	2	4	4	3	30	Low		Medium			
	degree to which impact can be reversed:	Partially reversible										

Potential	Military	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)	е		
	degree of impact on irreplaceable resources:				Low						
	Nature of impact:	Permanent rem	noval of habitat	that is used, or	may be used,	by avifauna.					
	without	1	5	6	5	60	Medium		Medium		
	with	1	5	6	5	60	Medium		Medium		
Habitat Destruction	degree to which impact can be reversed:		Irreversible								
	degree of impact on irreplaceable resources:	Medium									
		Ash	n Disposal I	Facility - A	ternative	С					
Potential		Extent	Duration	Magnitude	Probability	Sign	ificance	Status			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	-D+M)*P)	(+ve or - ve)	Confidence		
	Nature of impact:	Noise and move	ement, from sta	ff and machine	ry, may disturl	o avifauna, and	nests my be dist	urbed.			
	without	2	4	4	4	40	Medium		Medium		
	with	2	4	4	3	30	Low		Medium		
Disturbance	degree to which impact can be reversed:			Part	ally reversible						
degree of impact on irreplaceable Low resources:											

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Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	·D+M)*P)	(+ve or -ve)	е		
	Nature of impact:	Permanent rem	noval of habitat	that is used, or	may be used,	by avifauna.					
	without	1	5	4	5	50	Medium		Medium		
	with	1	5	4	5	50	Medium		Medium		
Habitat Destruction	degree to which impact can be reversed:			I	rreversible						
	degree of impact on irreplaceable resources:		Medium								
BATS											
		Asł	n Disposal F	acility - Al	ternative	: A					
Potential	Mitigation	Extent	Duration	Magnitude	Probability	Sign	Significance				
Impact		(E)	(D)	(M)	(P)	(S=(E+	+D+M)*P)	(+ve or - ve)	Confidence		
	Nature of impact:	If structures that are used by bats as roost sites are destroyed during the construction phase bats using structures may be killed									
	without	2	3	4	2	18	Low	-	High		
Roost disturbance	with	1	2	2	1	5	Low	-	High		
and/or destruction due to construction activities	degree to which impact can be reversed:	potential roost s	sites for bats are	not destroyed	or if identified the impact of	d bat colonies a f disturbance a	ructures that rep are relocated safe nd/or constructio	ely by a bat			
	degree of impact on irreplaceable resources:	Low									

Potential	Militaria	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)	е		
	Nature of impact:			Loss of	potential bat	foraging habita	at				
	without	4	4	2	4	40	Medium	-	Moderate		
Disturbance to	with	2	2	2	3	18	Low	-	Moderate		
and displacement from foraging habitat due to construction	degree to which impact can be reversed:	occurring veget the potential	ation should be disturbance to	kept to a minin and displaceme o man-made wa	num during thent of bats due	e construction to loss of fora Care should be	naining stands of phase in order to ging habitat. It ha taken to avoid dis	minimize as been			
activities	degree of impact on irreplaceable resources:		Low								
		Asł	n Disposal I	acility - A	ternative	C					
Potential		Extent	Duration	Magnitude	Probability	Significance		Status			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(F+D+M)*P) \ \		(+ve or - ve)	Confidence		
	Nature of impact:	If structures	that are used b	•	sites are destr structures ma		e construction ph	ase bats us	ing those		
Roost	without	2	3	4	2	18	Low	-	High		
disturbance and/or	with	1	1	2	1	4	Low	-	High		
destruction due to construction activities	degree to which impact can be reversed:	potential roost s specialist befo	Standard construction best practices must be followed. If man-made structures that represent potential roost sites for bats are not destroyed or if identified bat colonies are relocated safely by a bat specialist before destruction of the structure the impact of disturbance and/or construction on bat roost sites can be avoided altogether. Although no colonies were found on this site alternative it is possible that the farm building may support colonisation.								

Potential	Maintenant	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	·D+M)*P)	(+ve or -ve)	е			
	degree of impact on irreplaceable resources:				Low							
	Nature of impact:		Loss of potential bat foraging habitat									
Disturbance to	without	2	3	4	2	18	Low	-	High			
and	with	1	1 1 2 3 12 Low - Hig									
displacement from foraging habitat due to	degree to which impact can be reversed:	occurring veget	Standard construction best practices must be followed. Destruction of remaining stands of naturally ccurring vegetation should be kept to a minimum during the construction phase in order to minimize the potential disturbance to and displacement of bats due to loss of foraging habitat.									
construction activities	degree of impact on irreplaceable resources:		Low									
		Asl	n Disposal I	Facility - Al	ternative	В						
Potential		Extent	Duration	Magnitude	Probability	Sign	ificance	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E-	+D+M)*P)	(+ve or - ve)	Confidence			
	Nature of impact:	If structures	that are used b	•	sites are destr structures ma	•	e construction p	hase bats us	ing those			
Roost	without	3	3	4	2	20	Low	-	High			
disturbance and/or	with	1	2	2	1	5	Low	-	High			
destruction due to construction activities	degree to which impact can be reversed:	potential roost s specialist befo	Standard construction best practices must be followed. If man-made structures that represent potential roost sites for bats are not destroyed or if identified bat colonies are relocated safely by a bat specialist before destruction of the structure the impact of disturbance and/or construction on bat roost sites can be avoided altogether. It is unlikely that bats will colonise any part of this site alternative as no suitable structures were identified.									

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)	е			
	degree of impact on irreplaceable resources:		Low									
	Nature of impact:		Loss of potential bat foraging habitat									
Disturbance	without	2	2	4	4	32	Medium	-	High			
Disturbance to and	with	2	2	2	2	12	Low	-	High			
displacement from foraging habitat due to	degree to which impact can be reversed:	occurring veget the potential	undard construction best practices must be followed. Destruction of remaining stands of naturally curring vegetation should be kept to a minimum during the construction phase in order to minimize the potential disturbance to and displacement of bats due to loss of foraging habitat. Only a small number of man-made dams and naturally occurring vegetation exists on this site alternative.									
activities	degree of impact on irreplaceable resources:		Low									
VISUAL												
		Ash	Disposal F	acility – All	alternati	ves						
Transformation of the visual	Nature of impact:		A new ash disposal facility will be developed on the selected site. This will be introduced as new features into landscape, with moderate adverse visual impacts. No visual impacts are expected during construction of the fa									
quality of the	with	2	2	2	5	30	Low	-	High			
landscape	without	2	2	2	5	30	Low	-	High			
	degree to which impact can be reversed:	The impact during construction cannot be reversed.										

Potential	Mikingkian	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)	е		
	degree of impact on irreplaceable resources:		N/A								
NOISE											
		Ash	n Disposal I	Facility - Al	ternative	Α					
Potential Extent Duration Magnitude Probability Significan							ificance	Status			
Impact	Mitigation		(D)	(M)	(P)	(S=(E+	+D+M)*P) (+ve or - ve)		Confidence		
	Nature of impact:	Adherence to ambient noise levels listed by SANS 10103 for a rural district, i.e. 45 dBA (day) and 35 dB									
	without	2	2	2	3	18	Low	-	Definite		
	with	2	2	2	3	18	Low	-	Definite		
Noise	degree to which impact can be reversed:	Fully reversible									
	degree of impact on irreplaceable resources:		No impact								
	Nature of impact:			Increase	in present an	nbient noise le	vels				
	without	2	2	2	3	18	Low	-	Definite		
Noise	with	2	2	2	3	18	Low	-	Definite		
-10.00	degree to which impact can be reversed:	Fully reversible									

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Potential	Minimakian	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	·D+M)*P)	(+ve or -ve)	е	
	degree of impact on irreplaceable resources:				No impact					
		Asł	n Disposal I	acility - A	ternative	В				
Potential		Extent	Duration	Magnitude	Probability	Sign	ificance	Status		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E-	+D+M)*P)	(+ve or - ve)	Confidence	
	Nature of impact:	Adherence to	o ambient noise	levels listed by	SANS 10103 f	or a rural distr	ict, i.e. 45 dBA (d	day) and 35 d	BA (night).	
	without	2	2	2	3	18	Low	-	Definite	
	with	2	2	2	3	18	Low	-	Definite	
Noise	degree to which impact can be reversed:	Fully reversible								
	degree of impact on irreplaceable resources:	No impact								
	Nature of impact:			Increase	in present an	nbient noise le	vels			
	without	2	2	2	3	18	Low	-	Definite	
	with	2	2	2	3	18	Low	-	Definite	
Noise	degree to which impact can be reversed:			Fu	lly reversible					
	degree of impact on irreplaceable resources:				No impact					

Potential	Minimakian	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)	е		
		Ash	n Disposal I	Facility - A	ternative	С					
Potential		Extent	Duration	Magnitude	Probability	Sign	ificance	Status			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	-D+M)*P)	(+ve or - ve)	Confidence		
	Nature of impact:	Adherence to	ambient noise	levels listed by	SANS 10103 f	or a rural distri	ct, i.e. 45 dBA (da	ay) and 35 d	BA (night).		
	without	2	2	2	3	18	Low	-	Definite		
	with	2	2	2	3	18	Low	-	Definite		
Noise	degree to which impact can be reversed:			Fu	ly reversible						
	degree of impact on irreplaceable resources:		No impact								
	Nature of impact:			Increase	in present an	nbient noise le	vels				
	without	2	2	2	3	18	Low	-	Definite		
	with	2	2	2	3	18	Low	-	Definite		
Noise	degree to which impact can be reversed:			Fu	ly reversible						
	degree of impact on irreplaceable resources:	No impact									
	Linear Infrastructure Corridor – All Alternatives										
Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)		ificance -D+M)*P)	Status (+ve or -	Confidence		

Potential	Militar	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	·D+M)*P)	(+ve or -ve)	е		
								ve)			
	Nature of impact:	Adherence to ambient noise levels listed by SANS 10103 for a rural district, i.e. 45 dBA (day) and 35 dBA									
	without	1	2	2	4	20	Low	-	Definite		
	with	1	2	2	4	20	Low	-	Definite		
Noise	degree to which impact can be reversed:			Ful	ly reversible						
	degree of impact on irreplaceable resources:		No impact								
	Nature of impact:			Increase	in present an	nbient noise le	vels				
	without	1	2	2	4	20	Low	-	Definite		
	with	1	2	2	4	20	Low	-	Definite		
Noise	degree to which impact can be reversed:	Fully reversible									
	degree of impact on irreplaceable resources:			1	No impact						
HERITAGI	E										
		Ash I	Disposal Fa	cility – All	Alternati	ves					
Potential	Mitigation	Extent	Duration	Magnitude	Probabilit y	Sign	ificance	Status	Confidence		
Impact		(E)	(D)	(M)	(P)	(S=(E+D+M)*P) (+ve or - ve)		1 -	Confidence		

Potential	Military	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidenc			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)	е			
	Nature of impact:			De	struction of I	neritage sites						
	without	1	5	4	3	30	Low		High			
	with	1	5	4	3	30	Low		High			
	degree to which impact can be reversed:		Mi	tigation through	excavation/o	documentation						
	degree of impact on irreplaceable resources:											
SOCIAL	SOCIAL											
		Ash	Disposal Fa	acility – All	alternati	ves						
	Nature of impact:						will be undertak omic developmer					
Impact 1:	with mitigation	3	3	4	3	30	Low	+	Medium			
Economic Development	without mitigation	2	2	2	3	18	Low	+	Medium			
through employment	degree to which impact can be reversed:	Moderate						medium				
	degree of impact on irreplaceable resources:	Not Applicable						-				
Impact 2:	Nature of impact:	Any constructio temporary work			ing for work	and it is consid	ered likely that t	there will be	an influx of			
Inflow of temporary	with mitigation	2	2	2	3	18	Low	-	Medium			
workers	without mitigation	2	2	2	3	18	Low	-	Medium			

Potential	Mikingking	Extent	Duration	Magnitude	Probabili ty	Signific	ance	Status	Confidenc		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	-M)*P)	(+ve or -ve)	е		
	degree to which impact can be reversed:	Moderate						Medium			
	degree of impact on irreplaceable resources:	Not Applicable						-			
	Nature of impact:	The constructio groundwork's	n phase of the r	new ash disposa	l facility will	result in increased	I PM10 concen	trations due	e to		
	with mitigation	1	4	4	3	27	Low	-	Medium		
<i>Impact 3:</i> Health Risk	without mitigation	2	4	6	4	48	Medium	-	Medium		
from elevated PM 10 Concentrations	degree to which impact can be reversed:	High – with the	High – with the implementation of the relevant mitigation measures								
	degree of impact on irreplaceable resources:	Not Applicable						-			
	Nature of impact:	The constructio	n phase of the r	new ash disposa	I facility will	result in increased	dust fall rates	s due to gro	undwork's		
	with mitigation	1	4	4	3	27	Low	-	Medium		
Impact 4:	without mitigation	2	4	6	4	48	Medium	-	Medium		
Nuisance from elevated dustfall rates	degree to which impact can be reversed:	High – with the	igh – with the implementation of the relevant mitigation measures Medium								
	degree of impact on irreplaceable resources:	Not Applicable -									
		Duncask	disposal f	adilla. Na	Ca Alta						

Dry ash disposal facility - No-Go Alternative

GEOLOGY

In the event that the ash disposal facility is not constructed, there will be no impact on the underlying geology, therefore the status quo will remain.

AGRICULTURAL POTENTIAL

In the event that the ash disposal facility is not constructed, there will be no impact on the existing agricultural potential of the land in question, therefore

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Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signif	icance	Status	Confidenc			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+I	D+M)*P)	(+ve or -ve)	е			
the status quo wi	II remain.											
GROUND N	WATER											
	Nature of impact:					here will be no d undwater qualit		oundwater	conditions			
	with mitigation	2	1	4	4	28	Low	+	high			
Impact 1: No change to	without mitigation	2	1	4	4	28	Low	+	high			
groundwater conditions at the site	degree to which impact can be reversed:		impact (i.e. not building the ash disposal facility) could be reversed if some y affected the groundwater underlying the proposed site.									
	degree of impact on irreplaceable resources:	Groundwater re sense that alter				ered to be irrepladed.	aceable, in the					
SURFACE	WATER											
	Nature of impact:	The impacts asswell as severe h			a in its curre	nt state include:	agricultural and	d industrial	impacts as			
Impact 1:	with mitigation	3	4	8	4	60	Medium	+	High			
Impacts associated with	without mitigation	3	4	8	4	60	Medium	+	High			
the surrounding catchment	degree to which impact can be reversed:		npacts associated with the wetlands in the primary study area will not be easily sed due to their altered state									
	degree of impact on irreplaceable resources:					area is already i the surrounding		High				
BIODIVER	SITY											

In the event that the ash disposal facility is not constructed, no additional biodiversity impacts are expected and the status quo will remain.

AVIFAUNA

In the event that the ash disposal facility is not constructed, no avifauna impact can be expected and the status quo will remain.

HERITAGE

In the event that the ash disposal facility is not constructed, no Heritage impact can be expected as the grave will not be disturbed and the status quo will

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Potential	Mitiration	Extent	Duration	Magnitude	Probabili ty	Significance	Status	Confidenc
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or -ve)	е
remain								

VISUAL

In the event that the ash disposal facility is not constructed, no visual impact can be expected and the status quo will remain.

NOISE

Potential	Mitigation	Extent	Duration	Magnitude	Proba bility	Significan	ce	Status	Confidence				
Impact	iviitigation	(E)	(D)	(M)	(P)	(S=(E+D+M))*P)	(+ve or - ve)	Confidence				
	Nature of impact:	Adherence to	ambient nois	e levels listed by SA	NS 10103	for a rural district, i.e	e. 45 dBA (da	ıy) and 35 d	BA (night).				
	without	1	4	0	4	20	Low	-	Definite				
	with	1	4	0	4	20	Low	-	Definite				
Noise	degree to which impact can be reversed:		Fully reversible										
	degree of impact on irreplaceable resources:		No impact										
	Nature of impact:	Increase in present ambient noise levels											
	without	1	4	0	4	20	Low	-	Definite				
	with	1	4	0	4	20	Low	-	Definite				
Noise	degree to which impact can be reversed:												
	degree of impact on irreplaceable resources:	No impact											

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Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signific	ance	Status	Confidenc	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D-	+M)*P)	(+ve or -ve)	е	
SOCIAL										
	Nature of impact:	employees may	lose their jobs,	however, it is	considered lik	re as a result of lacked that a numbe tuka power station	r will be able t	. , ,		
Impact 1:	with mitigation	2	3 4 3 27 Low - Mediu							
Economic Development	without mitigation	2	3	6	4	44	Medium	-	Medium	
through employment	degree to which impact can be reversed:		Although job los	sses are of great	concern the	he social closure d ere is an increase i pportunities		medium		
	degree of impact on irreplaceable resources:	Not Applicable						-		
	Nature of impact:	If the ash dispo facilities are at			e power stat	cion will need to be	e closed once t	he existing	ash disposal	
Impact 2:	with mitigation	No mitigation						High		
Continued supply of	without mitigation	4	4	6	5	70	High	-	High	
electricity from Tutuka power station	degree to which impact can be reversed:		Moderate – this impact can only be avoided and reversed if the ash disposal facility is constructed/continued. High							
5303.51.	degree of impact on irreplaceable resources:	Not Applicable				-				

Table 9.2: Detailed assessment of identified impacts for the Operational Phase - Ash disposal facility

Potential	Military	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	0		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	·D+M)*P)	(+ve or - ve)	Confidence		
GEOLOGY											
Impact 1:	Nature of impact:								d storage can be elevant mitigation		
Pollution of geological	with mitigation	1	1	2	2	8	Low	Neutral	High		
features in case of spillage or	without mitigation	3	4	6	3	39	Medium	-	High		
leakage of hydrocarbon and other hazardous	degree to which impact can be reversed:	Low	N								
material	d										
AGRICULT	JRAL POTEN	TIAL									
			Ash Dispos	al Facility -	Alternat	ive A					
Determinal locates	D.G.L.	Extent	Duration	Magnitude	Probabilit y	Signi	ficance	Status	Confidence		
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence		
	Nature of impact:		Una	vailability of soi	I resource for	agriculture du	ue to positioning	of ADF			
	without	1	5	10	5	80	High	-	Confident		
Loss of	with	1	5	10	5	80	High				
agricultural soil	degree to which impact can be reversed:	Impo	ossible to reverse	e as soils will be	completely a	nd permanent	tly covered by Al	DF			

Probabili

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Potential		Extent	Duration	Magnitude	Probabili tv	Signifi	cance	Status	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	P+M)*P)	(+ve or - ve)	Confidence
	degree of impact on irreplaceable resources:	Absence c	of high potential s	oils means that resources with			e loss of irrepla	aceable	
			Ash Dispos	al Facility -	Alternat	ive B			
		Extent	Duration	Magnitude	Probabilit v	Signifi	cance	Status	
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or - ve)	Confidence
	Nature of impact:		Una	vailability of soi	l resource for	agriculture due	to positioning	of ADF	
	without	1	5	10	5	80 High		-	Confident
	with	1	5	10	5	80	High		
Loss of agricultural soil	degree to which impact can be reversed:	Impo	ossible to reverse	as soils will be	completely a	nd permanently	covered by AD	F	
	degree of impact on irreplaceable resources:	Very proba	able absence of h irrepla	· ·		at there will not local soil patter		e loss of	
			Ash Dispos	al Facility -	Alternat	ive C			
Data d'allances		Extent	Duration	Magnitude	Probabilit y	Signifi	cance	Status	Confidence
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or - ve)	Confidence
Loss of	Nature of impact:		Una	vailability of soi	l resource for	agriculture due	to positioning	of ADF	
Loss of agricultural soil	without	1	5	10	5	80 High		-	Confident
agricultural 3011	with	1	5	10	5	80 High			

Potential		Extent Duration Magnitude Probabili ty Significance Status											
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D-	+M)*P)	(+ve or - ve)	Confidence				
	degree to which impact can be reversed:	Impo	ossible to revers	e as soils will be	completely a	nd permanently	covered by AD)F					
	degree of impact on irreplaceable resources:	Very proba	Very probable absence of high potential soils means that there will not be a large-scale loss of irreplaceable resources within the local soil pattern.										
GROUND W	ATER												
		Į.	Ash Disposal Facility - All alternatives										
	Nature of impact: Possible rise in the water table as ash is deposited and recharge is potentially concentrated / increased. The rate depend on the rate of leachate migration in the ash disposal facility, and this is not known with certainty.												
Rise in local water table due to	Without Mitigations	1	4	4	4	36	Medium	-	Medium				
additional recharge caused	With Mitigation	1	4	2	3	21	Low	-	Medium				
by ash deposition and possible concentration of	Degree to which impact can be reversed:		irely reverse this would be very e	•	ner used und	er the ash dispos	al facility wou	ld mostly	Medium				
recharge													
Change in local groundwater flow	Nature of impact:					tered locally due terms of volume		'mounding" o	f the local water				
directions due to possible rise in	Without Mitigations	2	4	2	4	32	Medium	-	Medium				
local water table	With Mitigation	1	4	2	3	21	Low	-	Medium				

Potential		Extent	Duration	Magnitude	Probabili ty	Signifi	cance	Status					
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)	Confidence				
	Degree to which impact can be reversed:	the ash disposa		impact unless a d and re-vegeta tate.			•	•	Medium				
	Degree of impact on irreplaceable resources:		Impact likely to be on local groundwater only, which is not irreplaceable. nwater percolating through the ash disposed will dissolve potential contaminants in the ash (e.g. SO4)										
	Nature of impact:	•	•	the ash dispose nwards into the		•	aminants in th	e ash (e.g. SO4)	Hg, F, Na) and				
	Without Mitigations	2	2 4 4 3 30 Low -										
Deterioration of	With Mitigation	1	4	2	4	28	Low	-	Medium				
groundwater quality due to leachate from ash disposal facility	Degree to which impact can be reversed:	amount of lead systems work a	t will be difficult to reverse this impact during ash dam operation. It is more feasible to reduce the amount of leachate as much as possible by ensuring that the under-drain the liner and related systems work as designed. When deposition ceases, natural attenuation over many years is likely to slowly reverse the impact.										
	Degree of impact on irreplaceable resources:	Impact likely to	be on local gro	undwater only.					Medium				
Groundwater contamination in	Nature of impact:	facility may lea	k from surface v	ounded near the vater impoundm) from the ash d	ents into surf	face water syste	•	•	the ash disposal water some				
local area due to infiltration from	Without Mitigations	2	4	4	3	30	Low	-	High				
surface water polluted by the	With Mitigation	1	2	2	2	10	Low	-	High				
ash disposal facility.	Degree to which impact can be reversed:	Impact can be reversed successfully if all surface water infrastructure is kept in good condition and appropriately designed (e.g. for flood events)											

Potential		Extent	Duration	Magnitude	Probabili tv	Signific	cance	Status					
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D-	+M)*P)	(+ve or - ve)	Confidence				
	Degree of impact on irreplaceable resources:	Impact likely	to be on local g	roundwater whi supply to a ne	•	pensive to replacer example.	ce if it is a sole	source of	Medium				
	Nature of impact:	Spillages of hydgroundwater r	, •	diesel) or solver	nts or other p	ollutants may ha	ive an impact o	on the quality	of local				
	Without Mitigations	2											
Deterioration of	With Mitigation	1	1	2	1	4	Low	-	High				
groundwater quality due to spillages of hydrocarbons	Degree to which impact can be reversed:	impact is diffic if appropriate	ult and expensive precautions are eas, control of a	re - i.e. the degre taken during the	ee to which the construction	to migrate dowr le impact can be phase (e.g. the nces at the site),	reversed is low	w. However, uelling and	High				
	Degree of impact on irreplaceable resources:		Impact likely to	be on local grou	ndwater only	, which is not irre	eplaceable.		Medium				
SURFACE V	VATER												
			Ash Dispos	al Facility -	Alternat	ive A							
Impacts on hydrology	Nature of impact:		ecreased flows within the downslope wetlands will result in a decreased wetland extent and decreased vegetation v as wetland species are replaced by dry land species, increasing the risk of erosion especially during flood events.										
, 5. 5.561	without	3	5	2	5	50	Medium	-	<u> </u>				
	with	2	5	2	5	45	Medium	-	3				

Potential		Extent	Duration	Magnitude	Probabili ty	Significa	nce	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+N	M)*P)	(+ve or - ve)	Confidence			
	degree to which impact can be reversed:			Can	be reversed				3			
	degree of impact on irreplaceable resources:		Low									
	Nature of impact:	significant dete is likely to have downstream	Seepage or leakage of polluted water out of the ash disposal facility and into adjacent wetlands is like gnificant deterioration of water quality within the receiving water resources. Decreasing water quality wikely to have a deleterious effect on biodiversity supported by the wetlands, as well as making the water downstream water users. Downstream water users at a local scale include farmers using the water for lind irrigation, while further downstream the polluted water would enter the Leeuspruit, Blesbokspruit a									
Impacts on	without	3	5	4	5	60	Medium		3			
surface water quality	with	2	5	4	4	44	Medium		3			
quanty	degree to which impact can be reversed:			Can not b	e readily rev	ersed			3			
	degree of impact on irreplaceable resources:		Low									
			Ash Dispos	al Facility -	Alternat	tive B						
Data atial large of	D. d'iki naki na	Extent	Duration	Magnitude	Probabilit y	Significan	nce	Status	Confidence			
Potential Impact	Mitigation	(E) (D) (M) (P) (S=(E+D+M)*P) (+ve or - ve)							Confidence			

Potential		Extent	Duration	Magnitude	Probabili ty	Signifi	cance	Status	0 51			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D)+M)*P)	(+ve or - ve)	Confidence			
	Nature of impact:		ws within the do nd species are re	•					d vegetation vigour g flood events.			
	without	2	5	6	5	65	High	-	3			
Impacts on	with	2	5	6	5	65	High	-	3			
hydrology	degree to which impact can be reversed:		Can be reversed									
	degree of impact on irreplaceable resources:		Low									
	Nature of impact:	significant detri is likely to have downstream	erioration of wat a deleterious ef water users. Dov	er quality withii fect on biodiver wnstream watei	n the receiving sity supported r users at a loc	water resourd by the wetlantal scale include	es. Decreasing ds, as well as n farmers using	water quality naking the wa the water for	tely to result in a within the wetlands ter less fit for use for livestock watering and the Vaal River.			
Impacts on surface water	without	3	5	6	5	70	High	-	3			
quality	with	2	4	4	4	40	Medium	-	3			
	degree to which impact can be reversed:			Can not b	e readily reve	rsed			3			
	degree of impact on irreplaceable resources:				Low				3			

Potential	Militar	Extent	Duration	Magnitude	Probabili ty	Signific	cance	Status	Conf. Inc.
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)	Confidence
			Ash Dispos	al Facility -	Alternat	tive C			
Dotantial Impact	Mitigation	Extent	Duration	Magnitude	Probabilit y	Signific	ance	Status	Confidence
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	·M)*P)	(+ve or - ve)	Comidence
	Nature of impact:			•		in a decreased w			ed vegetation vigour g flood events.
	without	2	5	4	5	55	Medium	-	3
Impacts on	with	2	5	4	5	55	Medium	-	3
Impacts on hydrology	degree to which impact can be reversed:			Can not b	e readily rev	ersed			
	degree of impact on irreplaceable resources:				Low				
Impacts on surface water quality	Nature of impact:	significant deto is likely to have downstream	erioration of wat a deleterious ef water users. Dov	er quality withii fect on biodivei vnstream wate	n the receivir sity supporte r users at a lo	ng water resource ed by the wetland ocal scale include	es. Decreasing ds, as well as m farmers using	water quality naking the wa the water for	cely to result in a within the wetlands ter less fit for use for livestock watering and the Vaal River.
	without	3	5	4	5	60	Medium		3
	with	2	4	4	4	40	Medium		3

Extent

Potential		Extent	Duration	Magnitude	tv	Significa	ance	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	-M)*P)	(+ve or - ve)	Confidence			
	degree to which impact can be reversed:			Can not b	oe readily rev	ersed						
	degree of impact on irreplaceable resources:				Low							
BIODIVERS	SITY											
			Ash Dispos	al Facility -	Alternat	tive A						
		Extent	Duration	Magnitude	Probabilit y	Significa	ance	Status				
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or - ve)	Confidence			
	Nature of impact:	site preparation	n activities, such	as soil disturba	nces and tops	•	o include imp	acts in habita	g construction and t that are associated			
Impacts on flora species of	without	3	4	10	4	68	High	-	High			
conservation	with	3	4	10	3	51	Medium	-	High			
importance (including habitat suitable for these	degree to which impact can be reversed:	important spec	•	uitable for thes	ocility is regarded irreversible. Impacts on conservation or these species will entirely destroy any habitat, rendering it ents							
species)	degree of impact on irreplaceable resources:		nese species are a	•		itat for these spec s well as occurring	_		High			
Impacts on fauna		Includes direct	impacts of devel	opment of the	ashing facility	on animals of co	nservation im	portance dur	ing construction and			

Magnitude

Duration

Probabili

site preparation activities, such as accidental killing and, particularly, habitat destruction. Also include impacts in habitat that are associated with the presence of conservation important species, although not necessarily recorded on the site

Significance

Status

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Nature of impact:

species of

conservation

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Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signific	Significance Status							
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D-	⊦M)*P)	(+ve or - ve)	Confidence					
importance	without	3	4	10	4	68	High	-						
(including habitat	with	3	4	10	3	51	Medium	-						
suitable for these species)	degree to which impact can be reversed:	created subseq		tion activities is	regarded in	orocess is regarde adequate to satisf ent corridors			High					
	degree of impact on irreplaceable resources:													
	Nature of impact:		on or degradation of important/ protected ecological types that are typically restricted in distribution and also igh in biodiversity. Wetlands are important in regards to the study area											
Impacts on	without	3	4	10	4	68	High	-	High					
sensitive or	with	3	4	8	3	45	Medium	-						
protected flora & fauna habitat types (including loss and	degree to which impact can be reversed:				• •	velopment is irrev s functionality and		_	High					
degradation)	degree of impact on irreplaceable resources:					l level implies a lo ical functionality		•	High					
Displacement of	Nature of impact:	•	ring fauna specie cles and activitie	•	•	cent areas of natu situations	ıral habitat, th	ne presence c	of construction					
fauna species,	without	2	5	6	5	65	High	-	High					
human-animal	with	2	5	4	5	55	Medium	=	High					
conflicts & interactions	degree to which impact can be reversed:	•	-	•	•	of the developm accustomed to s	_		Medium					

Potential	Military Miles	Extent	Duration	Magnitude	Probabili ty	Significa	ance	Status					
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	M)*P)	(+ve or - ve)	Confidence				
	degree of impact on irreplaceable resources:	Moderate, affec	cted species mig	ht include anima	als of conserv	ation importance			Medium				
	Nature of impact:	corridors. Effec	ctive ecological fo	unctioning of th	e habitat is als	um on remaining so dependent on vement corridors	a minimum a	vailability of					
Impacts on	without	3	5	6	5	70	High	-					
ecological	with	3	5	4	5	60	Medium	-					
connectivity and ecosystem functioning	degree to which impact can be reversed:	The severity of	y of the development implies that the impact cannot be reversed										
	degree of impact on irreplaceable resources:		ng habitat contri ts on surroundin		s of functiona	lity on a landscap	e scale, there	efore also	Medium				
	Nature of impact:		ounding habitat d deterioration o	•		the above, as wel t, etc	ll as additiona	al impacts su	ch as habitat				
	without	3	5	8	5	80	High	-	High				
	with	3	4	6	5	65	High	-	Medium				
Indirect impacts on surrounding habitat	degree to which impact can be reversed:	•	ementation of d impacts to the o			s could result in re	eduction and		Medium				
	degree of impact on irreplaceable resources:	Moderate, impo	ortance of surro	unding natural h	abitat increas	ses with the loss o	of habitat fro	m the site	Medium				
			Ash Dispos	al Facility -	Alternati	ive B							
Potential Impact	Mitigation	Extent	Duration	Magnitude	Probabilit	Significa	nce	Status	Confidence				

Mature of impacts on floral sortion Mithout Mithou	Potential		Extent	Duration	Magnitude	Probabili ty	Significa	nce	Status					
Includes direct impacts of development of the ashing facility on plants of conservation importance of conservation importance of conservation importance of impacts of the proposed ashing facility is regarded irreversible. Impacts on fauna species of impact on irreplaceable resources: Mature of impact Includes direct impacts of development of the ashing facility on plants of conservation importance of conservation important species, although not necessarily recorded on the site	Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	M)*P)	•	Confidence				
Impacts on flora species of conservation importance (including habitat suitable for these species) Mature of impact: Site preparation activities', such as soil disturbances and topsoil stripping. Also include impacts in habitat that are associated with the presence of conservation important species, although not necessarily recorded on the site			(E)	(D)	(M)	•	(S=(E+D+N	1)*P)	l ' .					
species of conservation importance (including habitat suitable for these species) Mature of importance (including habitat suitable for these species of conservation importance (including habitat suitable for these species of conservation importance (including habitat suitable for these species of conservation importance (including habitat suitable for these species of conservation importance (including habitat suitable for these species of conservation importance (including habitat suitable for these species of conservation importance (including habitat suitable for these species of conservation importance (including habitat suitable for these species of conservation importance (including habitat suitable for these species of conservation importance (including habitat suitable for these species of conservation importance (including habitat suitable for these species of conservation importance (including habitat suitable for these species of conservation importance (including habitat suitable for these species of conservation importance (including habitat suitable for these species and suitable habitat suitable habitat fragmented habitat or these species is regarded included significant as these species and suitable habitat preparation activities, such as accidental killing and, particularly, habitat destruction. Also include impacts in habitat that are associated with the presence of conservation important species, although not necessarily recorded on the site without 4 5 8 8 3 51 Medium - Without 4 5 6 8 3 45 Medium - Without 4 5 6 8 3 45 Medium - Without 4 5 6 8 3 45 Medium - Without 4 5 6 8 3 45 Medium - Without 4 5 6 8 3 45 Medium - Without 4 6 5 6 3 45 Medium - Without 4 6 5 6 3 45 Medium - Without 4 6 5 6 3 45 Medium - Without 4 6 5 6 3 45 Medium - Without 4 6 5 6 3 45 Medium - Without 4 6 5 6 3 45 Medium - Without 4 6 5 6 3 45 Medium - Without 4 6 5 6 3 45 Medium - Without 4 6 5 6 3 45 Medium - Without 4 6 5 6 3 45 Medium - Without 4 6 5 6 3 45 Medium - Without 4 6 5 6 3 45 Medium - Without 4 6 5 6 3	Impacts on flora	Nature of impact:	site preparation	activities', such	as soil disturba	nces and top	soil stripping. Also	include imp	acts in habita	~				
with 4 5 6 3 45 Medium - High degree to which impact can be irreversed: inadequate in terms of habitat requirements species) Direct impacts of the proposed ashing facility is regarded irreversible. Impacts on conservation important species and habitat suitable for these species will entirely destroy any habitat, rendering it imadequate in terms of habitat requirements The loss of conservation important species and suitable habitat for these species is regarded significant as these species are already limited in numbers as well as occurring in localised and fragmented habitat Includes direct impacts of development of the ashing facility on animals of conservation importance during construction and site preparation activities', such as accidental killing and, particularly, habitat destruction. Also include impacts in habitat that are associated with the presence of conservation important species, although not necessarily recorded on the site without 4 5 8 3 51 Medium - Without 4 5 6 3 45 Medium - Without 5 6 3 45 Medium - Without 6 Gegree to which impact can be reversed: 6 Gegree of impact on irreplaceable presence of conservation important species, although not necessarily recorded on the site of the subsequent to construction activities is regarded inadequate to satisfy habitat requirements of the subsequent to construction activities is regarded inadequate to satisfy habitat requirements of the subsequent to construction activities is regarded inadequate to satisfy habitat requirements of the subsequent to construction activities is regarded inadequate to satisfy habitat requirements of the subsequent to construction activities is regarded inadequate to satisfy habitat requirements of the subsequent to construction activities is regarded inadequate to satisfy habitat requirements of the subsequent to construction activities is regarded inadequate to satisfy habitat requirements of the subsequent to construction activities is regarded inadequate to satisfy habitat requirements of the subsequent to con	•	without	4	5	8	3	51	Medium	-	High				
(including habitat suitable for these species) Impact can be reversed: Important species and habitat suitable for these species will entirely destroy any habitat, rendering it inadequate in terms of habitat requirements	•	with	4	5	6	3	45	Medium	-	High				
Impacts on fauna species of conservation important species are already limited in numbers as well as occurring in localised and fragmented habitat Includes direct impacts of development of the ashing facility on animals of conservation importance during construction and site preparation activities', such as accidental killing and, particularly, habitat destruction. Also include impacts in habitat that are associated with the presence of conservation important species, although not necessarily recorded on the site without 4 5 8 3 51 Medium - with 4 5 6 3 45 Medium - degree to which impact can be reversed: bestruction of habitat and animals during the construction process is regarded irreverisble. Habitat created subsequent to construction activities is regarded inadequate to satisfy habitat requirements of these species, also affecting migration patterns and movement corridors Degree of impact on irreplaceable resources: Destruction or degradation of important/ protected ecological types that are typically restricted in distribution and also	(including habitat suitable for these	impact can be	important spec	tant species and habitat suitable for these species will entirely destroy any habitat, rendering it quate in terms of habitat requirements										
Impacts on fauna species of conservation importance (including habitat suitable for these species) Nature of impact: site preparation activities', such as accidental killing and, particularly, habitat destruction. Also include impacts in habitat that are associated with the presence of conservation important species, although not necessarily recorded on the site	species)	on irreplaceable	significant as th	oss of conservation important species and suitable habitat for these species is regarded icant as these species are already limited in numbers as well as occurring in localised and High										
species of conservation with 4 5 8 3 45 Medium - degree to which importance (including habitat suitable for these species) degree of impact on irreplaceable resources: Impacts on Nature of impact: Nature of impact: Destruction of habitat and animals during the construction process is regarded irreverisble. Habitat on satisfy habitat requirements of these species, also affecting migration patterns and movement corridors High impacts on the landscape places a priority on remaining areas of suitable habitat, rehabilitation to a pristine status is not regarded possible and losses are irreversible Destruction of habitat and animals during the construction process is regarded irreverisble. Habitat these species, also affecting migration patterns and movement corridors High impacts on Destruction or degradation of important/ protected ecological types that are typically restricted in distribution and also	Impacts on fauna	Nature of impact:	site preparation	n activities', such	as accidental k	illing and, pa	rticularly, habitat d	lestruction. /	Also include i	mpacts in habitat				
with 4 5 6 3 45 Medium - degree to which impact can be reversed: species) degree of impact on irreplaceable resources:	-	without	4	5	8	3	51	Medium	-					
(including habitat suitable for these species) Impact can be reversed: Created subsequent to construction activities is regarded inadequate to satisfy habitat requirements of these species, also affecting migration patterns and movement corridors Significant, high transformation and fragmentation levels in the landscape places a priority on remaining areas of suitable habitat, rehabilitation to a pristine status is not regarded possible and losses are irreversible Impacts on Nature of impact: Destruction or degradation of important/ protected ecological types that are typically restricted in distribution and also Created subsequent to construction activities is regarded inadequate to satisfy habitat requirements of these species, also affecting migration patterns and movement corridors Significant, high transformation and fragmentation levels in the landscape places a priority on remaining areas of suitable habitat, rehabilitation to a pristine status is not regarded possible and losses are irreversible Destruction or degradation of important/ protected ecological types that are typically restricted in distribution and also	l .	with	4	5	6	3	45	Medium	-					
on irreplaceable resources: Impacts on Nature of impact: On irreplaceable remaining areas of suitable habitat, rehabilitation to a pristine status is not regarded possible and losses are irreversible Destruction or degradation of important/ protected ecological types that are typically restricted in distribution and also	(including habitat suitable for these	impact can be	created subseq	uent to construct	ion activities is	regarded in	adequate to satisfy			High				
Nature of impact	species)	on irreplaceable	remaining areas	s of suitable habi	~		• •	•		High				
		Nature of impact:							icted in distri	bution and also				

Potential	Mitigation								Confidence				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)	Confidence				
protected flora &	without	3	4	8	3	45	Medium	-	High				
auna habitat	with	3	4	6	3	39	Medium	-					
types (including oss and degradation)	degree to which impact can be reversed:				• •	elopment is irrev functionality an		_	High				
	degree of impact on irreplaceable resources:	•	t, the restricted distribution on a local and regional level implies a loss of these important pes affects the habitat directly, but also the ecological functionality on a larger scale occurring fauna species will be displaced into adjacent areas of natural habitat, the presence of const										
	Nature of impact:	•	vehicles and activities will likely result in conflict situations										
	without	2	5	6	4	52	Medium	-	High				
Displacement of	with	2	5	4	3	33	Medium	-	High				
fauna species, numan-animal conflicts & nteractions	degree to which impact can be reversed:	•	Reversal of impact generally not possible due to the severity of the development, mitigation can obtentially result in reduction of severity. Animals will grow accustomed to structures after a period										
nteractions	degree of impact on irreplaceable resources:	Moderate, affe	Moderate, affected species might include animals of conservation importance										
mpacts on	Nature of impact:	corridors. Effec	tive ecological fu	unctioning of th	e habitat is a	iium on remainin Iso dependent or ovement corridor	n a minimum a	vailability of					
ecological	without	3	5	6	4	56	Medium	-					
connectivity and	with	3	5	4	3	36	Medium	=					
ecosystem Functioning	degree to which impact can be reversed:	The severity of	the developmen	t implies that th	ne impact can	not be reversed			Medium				

Potential		Extent	Duration	Magnitude	Probabili ty	Significa	nce	Status	0 51
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	M)*P)	(+ve or - ve)	Confidence
	degree of impact on irreplaceable resources:		ng habitat contri ts on surroundin		s of function	ality on a landscap	e scale, there	efore also	Medium
	Nature of impact:	•	ounding habitat d deterioration d	•		the above, as wel st, etc	l as additiona	al impacts sud	ch as habitat
	without	3	5	6	4	56	Medium	-	High
	with	3	4	4	3	33	Medium	-	Medium
Indirect impacts on surrounding habitat	degree to which impact can be reversed:	•	ementation of d impacts to the c	Medium					
	degree of impact on irreplaceable resources:	Moderate, impo	ortance of surrou	unding natural h	nabitat increa	ses with the loss o	f habitat fron	m the site	Medium
			Ash Dispos	al Facility -	Alternat	tive C			
Data d'alla carl		Extent	Duration	Magnitude	Probabilit y	Significa	nce	Status	Confidence
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+N	1)*P)	(+ve or - ve)	Confidence
Impacts on flora species of	Nature of impact:	site preparation	n activities', such	as soil disturba	nces and top	•	include imp	acts in habita	g construction and at that are associated
conservation	without	4	5	10	4	76	High	-	High
importance	with	4	5	8	3	51	Medium	-	High
(including habitat suitable for these species)	degree to which impact can be reversed:	important spec		uitable for these	•	eversible. Impacts entirely destroy a			High

Potential		Extent	Duration	Magnitude	Probabili ty	Signifi	cance	Status					
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)	Confidence				
	degree of impact on irreplaceable resources:		servation import ese species are a pitat	•		•			High				
mpacts on fauna	Nature of impact:	site preparation		as accidental ki	lling and, par	ticularly, habita	t destruction.	Also include i	ing construction and mpacts in habitat ded on the site				
species of	without	4	5	10	4	76	High	-					
conservation	with	4	5	8	3	51	Medium	-					
importance (including habitat suitable for these	degree to which impact can be reversed:	created subseq	tion of habitat and animals during the construction process is regarded irreversible. Habitat subsequent to construction activities is regarded inadequate to satisfy habitat requirements of lecies, also affecting migration patterns and movement corridors nt, high transformation and fragmentation levels in the landscape places a priority on										
species)	degree of impact on irreplaceable resources:		s of suitable hab				•		High				
	Nature of impact:		degradation of ir biodiversity. W	•		• •	• •	icted in distri	bution and also				
Impacts on	without	3	5	8	3	48	Medium	-	High				
sensitive or	with	3	5	6	3	42	Medium	-					
protected flora & fauna habitat types (including types (i									High				
loss and degradation) degree of impact on irreplaceable resources: Significant, the restricted distribution on a local and regional level implies a loss of these important habitat types affects the habitat directly, but also the ecological functionality on a larger scale High													
	on irreplaceable					•		•	High				
	on irreplaceable	habitat types af		directly, but als	so the ecologiced into adjac	ent areas of nat	on a larger sc	ale					

Potential	Minima	Extent	Duration	Magnitude	Status	0							
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D)+M)*P)	(+ve or - ve)	Confidence				
conflicts &	with	2	5	4	4	44	Medium	-	High				
interactions	degree to which impact can be reversed:	·	act generally not It in reduction of	•	•	•			Medium				
	degree of impact on irreplaceable resources:	Moderate, affe	te, affected species might include animals of conservation importance										
	Nature of impact:	corridors. Effec	formed nature of the landscape places a high premium on remaining natural habitat to serve as migration. Effective ecological functioning of the habitat is also dependent on a minimum availability of natural habitat increases disruption of movement corridors and functionality										
Impacts on	without	3	5	6	5	70	High	-					
ecological	with	3	5	4	4	48	Medium	-					
connectivity and ecosystem functioning	degree to which impact can be reversed:	The severity of	the developmen	t implies that th	e impact can	not be reversed	l		Medium				
	degree of impact on irreplaceable resources:		ng habitat contri ts on surroundin		s of function	ality on a landsc	ape scale, there	efore also	Medium				
	Nature of impact:	· · · · · · · · · · · · · · · · · · ·	ounding habitat d deterioration d				vell as additiona	al impacts su	ch as habitat				
Indirect impacts	without	3	5	8	4	64	High	-	High				
on surrounding	with	3	4	6	4	52	Medium	-	Medium				
habitat	degree to which impact can be reversed:		ementation of d impacts to the c			es could result in	reduction and		Medium				

Potential	Military	Extent	Duration	Magnitude	Probabili ty	Signifi	cance	Status	G 6: 1
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)	Confidence
	degree of impact on irreplaceable resources:	Moderate, imp	ortance of surro	unding natural h	nabitat increa	ses with the loss	of habitat fro	m the site	Medium
AVIFAUNA									
			Ash Dispos	al Facility -	Alternat	ive A			
		Extent	Duration	Magnitude	Probabilit V	Signific	cance	Status	
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D-	⊦M)*P)	(+ve or - ve)	Confidence
	Nature of impact:	Leachate conta	ining heavy met	als, could result	in contamina	ation of water so	urces, used by	water birds.	
	without	2	4	6	3	36	Medium		Low
	with	2	4	4	2	20	Low		Low
Contamination of surrounding water.	degree to which impact can be reversed:				Reversible				
	degree of impact on irreplaceable resources:				Low				
			Ash Dispos	al Facility -	Alternat	ive B			
Bata d'alta a		Extent	Duration	Magnitude	Probabilit y	Signific	cance	Status	O. Cil.
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or - ve)	Confidence
Contamination of	Nature of impact:	Leachate conta	ining heavy met	als, could result	in contamina	ation of water so	urces, used by	water birds.	
surrounding	without	2	4	6	3	36	Medium		Low

Impact water.	Mitigation		Duration	Magnitude	Probabili ty	Signific	ance	Status	0
water	with	(E)	(D)	(M)	(P)	(S=(E+D-	+M)*P)	(+ve or - ve)	Confidence
water.	with	2	4	4	2	20	Low		Low
	degree to which impact can be reversed:			F	Reversible				
	degree of impact on irreplaceable resources:				Low				
			Ash Dispos	al Facility -	Alternat	ive C			
		Extent	Duration	Magnitude	Probabilit V	Signific	ance	Status	0 51
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	(S=(E+D+M)*P) (+		Confidence
	Nature of impact:	Leachate conta	ining heavy meta	als, could result	in contamina	tion of water sou	urces, used by	water birds.	
	without	2	4	4	3	30	Low		Low
	with	2	4	4	2	20	Low		Low
surrounding	degree to which impact can be reversed:			F	Reversible				
	degree of impact on irreplaceable resources:				Low				
VISUAL									
			А	II Alternat	ives				

Mitigation			Magnitude	tv	Significance		Status					
Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence				
Nature of impact:	Visual exposure	Visual exposure of the newly introduced ash disposal facility is expected to create additional visual impacts by adding a new feature to the landscape that is large in spatial dimensions.										
without	2	4	6	5	60	Medium	-	High				
with	2	4	4	5	50	Medium	=	High				
introduced ash degree to which Views of the ash disposal facility are expected to be absorbed visually into the mass and s												
degree of impact on irreplaceable resources:				N/A								
Nature of impact:		It is expected the	hat the propose	ed new develo	pment would	add to cumulati	ve impacts, b	•				
without	2	4	6	5	60	Medium	-	High				
with	2	4	4	3	30	Low	-	Medium				
degree to which impact can be reversed:	planting grass, s	shrubs and tree	s on the slopes	that are visual	lly exposed to	the surrounding	g area. This					
	without with degree to which impact can be reversed: degree of impact on irreplaceable resources: Nature of impact: without with degree to which impact can be	Nature of impact: without 2 with 2 degree to which impact can be reversed: degree of impact on irreplaceable resources: Nature of impact: Without 2 The historical Power Station. without 2 degree to which impact can be planting grass, s	Nature of impact: Without With With With Views of the ash disposal facility existing features, particularly a slopes of ash disposances: The historical visual quality of Power Station. It is expected the with 2 4 With The visual appearance of stock planting grass, shrubs and tree	Nature of impact: Visual exposure of the newly introduced ash d feature to the without with	Nature of impact: Visual exposure of the newly introduced ash disposal facility feature to the landscape that without 2	Nature of impact: Visual exposure of the newly introduced ash disposal facility is expected to feature to the landscape that is large in specific feature to t	Nature of impact: Visual exposure of the newly introduced ash disposal facility is expected to create addition feature to the landscape that is large in spatial dimension without 2	Nature of impact: Visual exposure of the newly introduced ash disposal facility is expected to create additional visual impact and the proposed impact im				

Ash Disposal Facility - Alternative A

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signific	ance	Status	Confidence
Impact		(E)	(D)	(M)	(P)	(S=(E+D-	+M)*P)	(+ve or - ve)	
Potential Impact	Mitigation	Extent	Duration	Magnitude	Probabilit y	Signific	ance	Status	Confidence
Potential impact	IVIILIGATION	(E)	(D)	(M)	(P)	(S=(E+D+	M)*P)	(+ve or - ve)	Confidence
	Nature of impact:	Adherer	nce to ambient no	oise levels listed	l by SANS 101	LO3 for a rural dis	trict, i.e. 45 dl	BA (day) and	35 dBA (night).
	without	2	4	2	3	24	Definite		
	with	2	4	2	3	24	Low	-	Definite
Noise	degree to which impact can be reversed:			Ful	ly reversible				
	degree of impact on irreplaceable resources:			1	No impact				
	Nature of impact:			Incre	ease in preser	nt ambient noise	levels		
	without	2	4	2	3	24	Low	-	Definite
	with	2	4	2	3	24	Low	-	Definite
Noise	degree to which impact can be reversed:			Ful	ly reversible				
	degree of impact on irreplaceable resources:			1	No impact				
			Ash Dispos	al Facility -	Alternat	ive B			
Potential Impact	Mitigation	Extent	Duration	Magnitude	Probabilit y	Signific	Status	Confidence	

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Significa	ance	Status	Confidence		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	·M)*P)	(+ve or - ve)	Confidence		
		(E)	(D)	(M)	(P)	(S=(E+D+I	M)*P)	(+ve or - ve)			
	Nature of impact:	Adherer	ice to ambient no	oise levels listed	d by SANS 101	LO3 for a rural dist	rict, i.e. 45 d	BA (day) and	35 dBA (night).		
	without	2	4	2	3	24	Low	-	Definite		
	with	2	4	2	3	24	Low	-	Definite		
Noise	degree to which impact can be reversed:			Ful	ly reversible						
	degree of impact on irreplaceable resources:										
	Nature of impact:			Incre	ease in preser	nt ambient noise l	evels				
	without	2	4	2	3	24	Low	-	Definite		
	with	2	4	2	3	24	Low	-	Definite		
Noise	degree to which impact can be reversed:			Ful	ly reversible						
	degree of impact on irreplaceable resources:			1	No impact						
			Ash Disposal Facility - Alternative C								
Detential loss of	B. diair and a se	Extent	Duration	Magnitude	Probabilit y	Significa	ince	Status	Confidence		
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+l	VI)*P)	(+ve or - ve)	Confidence		
Noise	Nature of impact:	Adherence to ambient noise levels listed by SANS 10103 for a rural district, i.e. 45 dBA (day) and 35 dBA (night							35 dBA (night).		

Potential	Mitimation	Extent	Duration	Magnitude	Probabili ty	Signifi	cance	Status	Confidence			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)	Confidence			
	without	2	4	2	3	24	Low	-	Definite			
	with	4	24	Low	-	Definite						
	degree to which impact can be reversed:		Fully reversible									
	degree of impact on irreplaceable resources:		No impact									
	Nature of impact:		Increase in present ambient noise levels									
	without 2 2 2 3 18 Low -								High			
	with	2	2	2	3	18	Low	-	High			
Noise	degree to which impact can be reversed:			Ful	ly reversible							
	degree of impact on irreplaceable resources:			1	No impact							
SOCIAL												
		A	sh Disposa	l Facility - /	All Altern	atives						
	Nature of impact:		A positive impact through the continued provision of electricity to the region and the national grid									
Continued	with mitigation	4	5	6	5	75	High	+	Medium			
generation of electricity for the	without mitigation	4	5	6	5	75	High	+	Medium			
national grid	degree to which impact can be reversed:	Not Applicable Medium										

Potential		Extent	Duration	Magnitude	Probabili tv	Signifi	cance	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)	Confidence			
	degree of impact on irreplaceable resources:	High – through such as coal.	High – through the continued supply of electricity more use will be made of non-renewable resources such as coal.									
	Nature of impact:	The new ash di	he new ash disposal facility will potentially result in increased PM10 concentrations in the local area									
	with mitigation	1	4	4	3	27	Low	-	Medium			
Health Risk from	without mitigation	2	4	6	4	48	Medium	-	Medium			
elevated PM 10 Concentrations	degree to which impact can be reversed:	Moderate with	oderate with the implementation of the relevant mitigation measures									
	degree of impact on irreplaceable resources:	Not applicable	t applicable									
	Nature of impact:	The new ash di										
	with mitigation	1	4	4	3	27	Low	-	Medium			
Nuisance from	without mitigation	2	4	6	4	48	Medium	-	Medium			
elevated dustfall rates	degree to which impact can be reversed:	Moderate with	the implementa	tion of the relev	ant mitigatio	n measures			Medium			
	degree of impact on irreplaceable resources:	Not applicable							Medium			
		As	Ash disposal facility - No-Go Alternative									
GROUND W	/ATER											
Impact 1: No change to	Nature of impact:					here will be no o groundwater qua		groundwater	conditions			
groundwater	with mitigation	2	4	4	4	40	Medium	+	medium			
conditions at the site	without mitigation	2	4	4	4	40	Medium	+	medium			

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Significance	Status	Confidence			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P) (+ve or - ve)		Confidence			
	degree to which impact can be reversed:		nis positive impact (i.e. not building the ash disposal facility) could be reversed if some future ctivity affected the groundwater underlying the proposed site.								
	degree of impact on irreplaceable resources:	The groundwate	ne groundwater resource at the proposed site is not considered to be irreplaceable, in the sense nat alternative sources of water can be found if needed.								

SURFACE WATER

Decreased flows within the downslope wetlands will result in a decreased wetland extent and decreased vegetation vigour as wetland species are replaced by dry land species, increasing the risk of erosion especially during flood events.

BIODIVERSITY

If the ash disposal facility is not constructed or operated, there is likely to be no change to existing conditions, and therefore no additional impacts on biodiversity are anticipated

AVIFAUNA

If the ash disposal facility is not constructed or operated, there is likely to be no change to existing conditions, and therefore no potential impact on the avifauna is anticipated

VISUAL

If the ash disposal facility is not constructed or operated, there is likely to be no change to existing conditions, and therefore no potential visual impacts are anticipated

NOISE

	Ash Disposal Facility - No-Go													
Potential Impact	Mitigation	Extent	Duration	Magnitude	Probability	Significance		Status (+ve or -	Confidence					
P. C.	30.11	(E)	(D)	(M)	(P)	(S=(E+D+N	(S=(E+D+M)*P)							
	Nature of impact:	Adheren	ce to ambient n	oise levels listed	by SANS 10103	for a rural district	, i.e. 45 dB	A (day) and 3	35 dBA (night).					
Noise	without	1	4	0	4	20	Low	-	Definite					
	with	1	4	0	4	20	Low	-	Definite					

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Potential	Maint At	Extent	Duration	Magnitude	Probabili ty	Significan	ce	Status	Confidence			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)	(S=(E+D+M)*P) (+ve or - ve)					
	degree to which impact can be reversed:		Fully reversible No impact									
	degree of impact on irreplaceable resources:											
	Nature of impact:			Incre	ase in present	ambient noise leve	els					
	without	1	4	0	4	20	Low	-	Definite			
	with	1	4	0	4	20	Low	-	Definite			
Noise	degree to which impact can be reversed:			Full	y reversible							
	degree of impact on irreplaceable resources:		No impact									

SOCIAL

If the ash disposal facility is not constructed or operated, the power station might have to close down with negative impacts on the local community

EIA Ref Number: 14/12/16/3/3/3/52 NEAS Reference: DEA/EIA/0001416/2012

Table 9.3: Detailed assessment of identified impacts for the De-Commissioning Phase – Ash disposal facility

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Significan	се	Status	Confidence		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or - ve)	Confidence		
GROUND V	WATER										
		As	sh Disposal	Facility - A	All alterna	atives					
Potential	Mitigation	Extent	Duration	Magnitude	Probabilit y	Significan	ce	Status	Confidence		
Impact		(E)	(D)	(M)	(P)	(S=(E+D+M))*P)	(+ve or -ve)			
	Nature of impact:	Spillages of hydro on the quality of l	· · ·	•	or other poll	utants during the D	tants during the De commissioning phase				
	Without Mitigations	2	2	6	2	20	Low	-	High		
Deterioration of groundwater	With Mitigation	1	1	4	1	6	Low	-	High		
quality due to spillages during Decommissioni ng	Degree to which impact can be reversed:	is difficult and exp	pensive - i.e. the outions are taken outrol of all poten	degree to which during the con	h the impact of struction pha	migrate downward can be reversed is lease (e.g. the bundin the site), the threa	ow. Howev g of refuell	er, if ing and fuel	High		
	Degree of impact on irreplaceable resources:	Ir	mpact likely to b	e on local grour	ndwater only,	which is not irrepla	aceable.		Medium		
Deterioration of groundwater	Nature of impact:	Leachate from the	ash disposal fa	cility is likely to	continue to p	ercolate downward	ds even wh	en ash disposal	has ceased.		
quality due to leachate from	Without Mitigations	2	3	2	4	28	Low	-	Medium		
ash disposal	With Mitigation	2	2	2	4	24	Low	-	Medium		

Potential		Extent	Duration	Magnitude	Probabili ty	Significan	ce	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or - ve)	Confidence			
facility	Degree to which impact can be reversed:	is kept functional,	This impact can be significantly mitigated against, but cannot be entirely reversed. If the drainage system is kept functional, groundwater monitoring continues and the ash disposal facility is vegetated then downward drainage of leachate into the groundwater will be minimised.									
	Degree of impact on irreplaceable resources:	The impact on loc	al groundwater	is thought to be	low and loca	alised.			Medium			
	Nature of impact:	water migratir infiltration and	ng downwards w recharge charac s may lead to a	vill be lower. Ho teristics of the o slight rise in wa	wever, there overlying rehater table and	osal facility should be is likely to be a sma abilitated ash dam v potential local char r, and limited to the	all residual e will not be t nges in grou	effect on water the same as tho undwater flow	table, since the ose of the original			
Minor changes to local water	Without Mitigations	2	4	2	3	24	Low	-	Medium			
table and local	With Mitigation	2	3	2	3	21	Low	-	Medium			
groundwater flow direction	Degree to which impact can be reversed:	reduce movemen	t of water /leach	nate downward	s once ash de	ility and preventing position has ceased volve removing the	d. The full in	npact would	Medium			
	Degree of impact on irreplaceable resources:			Minor	impact only.				Medium			
Groundwater contamination in local area due	Nature of impact:	Surface water that is being impounded near the ash disposal facility and which is polluted by runoff from the as facility may leak from surface water impoundments into surface water system, and infiltrate into groundwater so (most likely local area) from the ash disposal facility.										
to infiltration from surface	Without Mitigations	2	4	4	3	30	Low	-	High			
water polluted	With Mitigation	1	2	2	2	10	Low	-	High			

Potential	B4141 41	Extent	Duration	Magnitude	ty	Status	Confidence						
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or - ve)	Confidence					
by the ash disposal facility.	Degree to which impact can be reversed:	Impact can be re appropriately de		•	water infrast	tructure kept in good condition	ı and	Medium					
	Degree of impact on irreplaceable resources:	Impact likely to be supply to a nearly	•		h may be ex	pensive to replace if it is a sole	source of	Medium					
SOILS AN	D AGRICULT	URAL POTE	AL POTENTIAL										
			Ash Disposal Facility - Alternative A										
Potential	Mitigation	Extent	Extent Duration Magnitude Probabil ity Significance Status										
Impact	J	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)							
	Nature of impact:	Unavailability of soil resource for agriculture due to positioning of ADF											
	without	1	5	10	5	80 High	-	Confident					
	with	1	5	10	5	80 High							
Loss of agricultural soil	degree to which impact can be reversed:	•			•	nently covered by ADF. However all by water or wind erosion in t	•						
	degree of impact on irreplaceable resources:	Absence of high	Absence of high potential soils means that there will not be a large-scale loss of irreplaceable resources within the local soil pattern.										
			Ash Disposal Facility - Alternative B										
Potential	Mitigation	Extent	Duration	Magnitude	Probabil ity	Significance	Status	Confidence					
Impact		(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or -ve)						
Loss of	Nature of impact:		Unavailability of soil resource for agriculture due to positioning of ADF										

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Magnitude

Duration

Probabili

Significance

Status

Extent

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Significa	ance	Status	Confidence		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	M)*P)	(+ve or - ve)	Confidence		
agricultural soil	without	1	5	10	5	80	High	-	Confident		
	with	1	5	10	5	80	High				
	degree to which impact can be reversed:	•	npossible to reverse as soils will be completely and permanently covered by ADF. However, complete covering by topsoil will stabilize ADF and prevent removal by water or wind erosion in the future								
	degree of impact on irreplaceable resources:	Very proba	Very probable absence of high potential soils means that there will not be a large-scale loss of irreplaceable resources within the local soil pattern.								
			Ash Disposal Facility - Alternative C								
Potential	Mitigation	Extent	Extent Duration Magnitude Probabil ity Significance Status								
Impact		(E)	(D)	(M)	(P)	(S=(E+D+N	/I)*P)	(+ve or -ve)			
	Nature of impact:		Unav	ailability of soil i	resource for	agriculture due to	positioning	of ADF			
	without	1	5	10	5	80	High	-	Confident		
	with	1	5	10	5	80	High				
Loss of agricultural soil	degree to which impact can be reversed:					nently covered by Il by water or wind					
	degree of impact on irreplaceable resources:	Very proba	Very probable absence of high potential soils means that there will not be a large-scale loss of irreplaceable resources within the local soil pattern.								
SURFACE	WATER										
			Ash Disposa	al Facility -	Alternat	ive A					
Potential Impact	Mitigation	Extent	Duration	Magnitude	Probabilit y	Significa	ance	Status	Confidence		

Potential		Extent	Duration	Magnitude	Probabili ty	Significan	ice	Status		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M	l)*P)	(+ve or - ve)	Confidence	
		(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or -ve)		
	Nature of impact:	The long term i				ty on surface wate ility of surface wate	•	•	ate and/or runoff	
	without	3	5	4	5	60	Medium	-	3	
	with	2	5	2	3	27	Low	-	3	
Water Quality	degree to which impact can be reversed:		Not readily reversed							
	degree of impact on irreplaceable resources:		Low							
		1	Ash Disposa	al Facility -	Alternati	ve B				
Potential	Mitigation	Extent	Duration	Magnitude	Probabilit y	Significan	ce	Status	Confidence	
Impact		(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or -ve)		
	Nature of impact:	The long term i	•		•	ty on surface wate ility of surface wat	•	•	ate and/or runoff	
	without	2	5	6	5	65	High	-	3	
Water Quality	with	2	5	6	3	39	Medium	-	3	
	degree to which impact can be reversed:	Not readily reversed								

Potential Impact	Mitigation	Extent	Duration	Magnitude	Probabili ty	Significance (S=(E+D+M)*P)		Status (+ve or - ve)	Confidence
		(E)	(D)	(M)	(P)				
	degree of impact on irreplaceable resources:		3						
			Ash Disposa	al Facility -	Alternati	ve C			
Potential Impact	Mitigation	Extent	Duration	Magnitude	Probabilit y	Significance Si		Status	Confidence
		(E)	(D)	(M)	(P)	(S=(E+D+M)*P) (+ve or -v			
Water Quality	Nature of impact:	The long term	te and/or runoff						
	without	2	5	4	5	55	Medium	-	3
	with	2	5	4	3	33	Medium	-	3
	degree to which impact can be reversed:	Not readily reversed							;
		Low							
	degree of impact on irreplaceable resources:				Low				5
BIODIVER	on irreplaceable resources:				Low				3
BIODIVER	on irreplaceable resources:		Ash Disposa	al Facility -		ve A			5
Potential Impact	on irreplaceable resources:	Extent	Ash Disposa	al Facility -		ve A Significand	ce	Status	Confidence

Potential	Mitigation	Extent	Duration	Magnitude (M)	Probabili ty	Significance (S=(E+D+M)*P)		Status (+ve or - ve)	Confidence
Impact		(E)	(D)		(P)				
importance (including habitat suitable for these species)	without	2	5	10	3	51	Medium	-	High
	with	2	5	10	2	34	Medium	-	High
	degree to which impact can be reversed:	Direct impacts of species and habitaterms of habitater	High						
	degree of impact on irreplaceable resources:	The loss of conser these species are	High						
Impacts on	Nature of impact:	Includes direct impacts of development of the ashing facility on animals of conservation importance during site preparation activities', such as accidental killing and, particularly, habitat destruction. Also include impart are associated with the presence of conservation important species, although not necessarily recorded on t							
fauna species of	without	2	5	10	3	51	Medium	-	
conservation importance (including habitat suitable for these species)	with	2	5	10	2	34	Medium	-	
	degree to which impact can be reversed:	Destruction of habitat and animals during the construction process is regarded irreversible. Habitat created subsequent to construction activities is regarded inadequate to satisfy habitat requirements of these species, also affecting migration patterns and movement corridors							
	degree of impact on irreplaceable resources:	Significant, high to areas of suitable I irreversible	High						
Impacts on sensitive or protected flora & fauna habitat types (including loss and degradation)	Nature of impact:	Destruction or de typically high in b	tion and also						
	without	2	4	10	3	48	Medium	-	High
	with	2	4	8	2	28	Low	-	
	degree to which impact can be reversed:	Destruction of ser will irreversibly af	High						

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
	degree of impact on irreplaceable resources:	_	Significant, the restricted distribution on a local and regional level implies a loss of these important habitat types affects the habitat directly, but also the ecological functionality on a larger scale									
	Nature of impact:	Naturally occurring and activities will	-	•	•		tural habitat, the	e presence of p	personnel, vehicles			
	without	2	5	6	5	65	High	-	High			
Displacement of	with	2	5	4	5	55	Medium	-	High			
auna species, numan-animal conflicts & nteractions	degree to which impact can be reversed:	Reversal of impac potentially result							Medium			
nteractions	degree of impact on irreplaceable resources: Moderate, affected species might include animals of conservation importance											
	resources.											
	Nature of impact:		al functioning of	f the habitat is a	lso dependen	t on a minimu	ım availability o		•			
mnacts on		Effective ecologic	al functioning of	f the habitat is a	lso dependen	t on a minimu	ım availability o		•			
•	Nature of impact:	Effective ecologic of natural habitat	al functioning of increases disru	f the habitat is a ption of movem	lso dependen ent corridors	it on a minimu and functiona	um availability of		•			
ecological connectivity and ecosystem	Nature of impact:	Effective ecologic of natural habitat	al functioning of increases disru 5 5	f the habitat is a ption of movem 6 4	lso dependen ent corridors 5 5	nt on a minimu and functiona 70 60	um availability of lity High Medium		•			
ecological connectivity and ecosystem	Nature of impact: without with degree to which impact can be	Effective ecologic of natural habitat 3	al functioning of increases disruption of the increases disruption of the increases disruption of the increases disruption of the increase of	f the habitat is a ption of movem 6 4 implies that the	so dependent ent corridors 5 5 impact canno	ot on a minimuland functiona 70 60 ot be reversed	um availability of lity High Medium	f natural habit - -	at. Transformatio			
Impacts on ecological connectivity and ecosystem functioning Indirect impacts on surrounding	Nature of impact: without with degree to which impact can be reversed: degree of impact on irreplaceable	Effective ecologic of natural habitat 3 3 The severity of th	al functioning of increases disruption increase disruption in	f the habitat is a ption of movem 6 4 implies that the utes to the loss areas an potentially in	so dependent corridors 5 5 impact cannot functionality clude all of the	ot on a minimuland functiona 70 60 ot be reversed by on a landsca	High Medium ape scale, there	f natural habit fore also	Medium			

Potential	Miliantina	Extent	Duration	Magnitude	Probabili ty	Signif	ficance	Status	Confidence		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence		
	with	2	3	4	2	18	Low	-	Medium		
	degree to which impact can be reversed:	Moderate, implei of impacts to the			on measures (could result in	ontainment	Medium			
	degree of impact on irreplaceable resources:	Moderate, impor	erate, importance of surrounding natural habitat increases with the loss of habitat from the site Medium								
			Ash Disposa	al Facility -	Alternati	ve B					
Potential	Mitigation	Extent	Duration	Magnitude	Probabilit y	Signi	ficance	Status	Confidence		
Impact		(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)			
Impacts on flora	Nature of impact:	Includes direct im site preparation a with the presence	ctivities', such a	s soil disturband	es and topso	il stripping. Al	so include impa	cts in habitat t	onstruction and nat are associated		
species of	without	3	5	8	2	32	Medium	-	High		
conservation	with	3	5	6	2	28	Low	-	High		
importance (including habitat suitable for these	degree to which impact can be reversed:	Direct impacts of species and habit terms of habitat r	at suitable for th	•	_	•		•	High		
species)	degree of impact on irreplaceable resources:	The loss of conse these species are	•	•		•		_	High		
Impacts on fauna species of conservation	Nature of impact:		ctivities', such a	s accidental killi	ng and, partio	cularly, habitat	destruction. Al	lso include imp	construction and acts in habitat that		
importance	without	3	5	8	2	32	Medium	-			

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Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence		
(including	with	3	5	6	2	28	Low	-			
habitat suitable for these species)	degree to which impact can be reversed:	Destruction of hall created subseque these species, also	High								
	degree of impact on irreplaceable resources:	Significant, high to areas of suitable hirreversible				• •	•		High		
	Nature of impact:	Destruction or de typically high in b	•	• •		• •	• •	cted in distribu	tion and also		
Impacts on	without	3	4	8	2	30	Low	-	High		
sensitive or	with	3	4	6	2	26	Low	-			
protected flora & fauna habitat types (including loss and	degree to which impact can be reversed:	Destruction of ser will irreversibly af	·		• •	•	• •	ng of topsoil	High		
degradation)	degree of impact on irreplaceable resources:	Significant, the re habitat types affe			_	•	•		High		
Displacement of	Nature of impact:	•	Naturally occurring fauna species will be displaced into adjacent areas of natural habitat, the presence of copersonnel, vehicles and activities will likely result in conflict situations								
fauna species,	without	2	High								
human-animal	with	2	5	4	3	33	Medium	-	High		
conflicts & interactions	degree to which impact can be reversed:	Reversal of impac potentially result	•		•	•	•		Medium		

Potential		Extent	Duration	Magnitude	Probabili ty	Signif	ficance	Status			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence		
	degree of impact on irreplaceable resources:	Moderate, affect	ed species might	t include animal	s of conservat	tion importanc	ce		Medium		
	Nature of impact:		al functioning of	f the habitat is a	lso depender	nt on a minimu	m availability o		nigration corridors. at. Transformation		
Impacts on	without	3	5	6	4	56	Medium	-			
ecological	with	3	5	4	3	36	Medium	-			
connectivity and ecosystem functioning	degree to which impact can be reversed:	The severity of th	severity of the development implies that the impact cannot be reversed								
	degree of impact on irreplaceable resources:	Loss of remaining implying impacts			of functionali	ty on a landsca	ape scale, there	fore also	Medium		
	Nature of impact:	Impacts on surrou degradation and				•	ell as additiona	impacts such	as habitat		
	without	2	4	6	4	48	Medium	-	High		
	with	2	4	4	3	30	Low	-	Medium		
Indirect impacts on surrounding habitat	degree to which impact can be reversed:	Moderate, impler of impacts to the			on measures (could result in	reduction and o	containment	Medium		
	degree of impact on irreplaceable resources:	Moderate, impor	tance of surrour	nding natural ha	bitat increase	s with the loss	of habitat fron	n the site	Medium		
			Ash Dispos	al Facility -	Alternati	ive C					
Potential	Mitigation	Extent	Duration	Magnitude	Probabilit		ficance	Status	Confidence		

Potential	Minimation	Extent	Duration	Magnitude	Probabili ty	Signif	icance	Status	Constitue on
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence
Impact					у				
		(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or -ve)	
Impacts on flora	Nature of impact:	Includes direct im site preparation a with the presence	ctivities', such a	s soil disturband	es and topso	il stripping. Al	so include impa	cts in habitat tl	onstruction and nat are associated
species of	without	3	4	10	3	51	Medium	-	High
conservation	with	3	4	8	2	30	Low	-	High
importance (including habitat suitable for these	degree to which impact can be reversed:	Direct impacts of species and habitat rerms of habitat r	at suitable for th						High
species)	degree of impact on irreplaceable resources:	The loss of conser these species are	•	•				_	High
Impacts on	Nature of impact:	Includes direct im site preparation a are associated with	ctivities', such a	s accidental killi	ng and, partic	cularly, habitat	destruction. A	lso include imp	acts in habitat that
fauna species of	without	3	4	10	3	51	Medium	_	
conservation	with	3							
		3	4	8	2	30	Low	-	
importance (including habitat suitable for these	degree to which impact can be reversed:	Destruction of ha created subseque these species, also	bitat and anima nt to constructi	s during the cor	struction pro garded inade	cess is regarde	ed irreversible.		High
(including	degree to which impact can be	Destruction of ha	bitat and animal nt to construction affecting migratures and formation a	Is during the cor on activities is re ation patterns and and fragmentation	estruction pro egarded inade and movement n levels in the	cess is regarde equate to satis t corridors e landscape pl	ed irreversible. fy habitat requi	rements of n remaining	High High
(including habitat suitable for these	degree to which impact can be reversed: degree of impact on irreplaceable	Destruction of ha created subseque these species, also Significant, high to areas of suitable h	bitat and anima nt to construction of affecting migra ransformation a nabitat, rehabilit	Is during the coron activities is reation patterns and fragmentation attion to a pristing portant/ protect	estruction pro egarded inade and movement n levels in the ne status is no ed ecological	cess is regarded to satist corridors elandscape plate to regarded potyges that are	ed irreversible. fy habitat requi- aces a priority o assible and losse	n remaining s are	High

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence
& fauna habitat	with	2	4	8	2	28	Low	-	
types (including loss and degradation)	degree to which impact can be reversed:	Destruction of ser will irreversibly af	ing of topsoil	High					
	degree of impact on irreplaceable resources:	Significant, the re habitat types affe			_	•	•		High
	Nature of impact:	Naturally occurring personnel, vehicle			•		tural habitat, the	e presence of o	construction
	without	2	5	6	5	65	High	-	High
Displacement of	with	2	5	4	4	44	Medium	-	High
fauna species, human-animal conflicts & interactions	degree to which impact can be reversed:	Reversal of impact potentially result							Medium
mecraetions	degree of impact on irreplaceable resources:	Moderate, affecte	ed species might	include animal	s of conserva	tion importan	ce		Medium
Impacts on	Nature of impact:		al functioning of	f the habitat is a	lso depender	nt on a minimu	um availability of		nigration corridors. at. Transformation
ecological 	without	3	5	6	5	70	High	-	
connectivity and ecosystem	with	3	5	4	4	48	Medium	-	
functioning	degree to which impact can be reversed:	The severity of th	e development	implies that the	impact canno	ot be reversed			Medium

Potential	Minima di an	Extent	Duration	Magnitude	Probabili ty	Signif	ficance	Status	C61			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
	degree of impact on irreplaceable resources: Loss of remaining habitat contributes to the loss of functionality on a landscape scale, therefore also implying impacts on surrounding areas Impacts on surrounding habitat can potentially include all of the above, as well as additional impacts such as											
	Nature of impact:	Impacts on surrou degradation and		•			ell as additiona	l impacts such	as habitat			
	without	2	4	6	4	48	Medium	-	High			
	with	2	3	4	3	27	Low	-	Medium			
Indirect impacts on surrounding habitat	degree to which impact can be reversed:	•	erate, implementation of dedicated mitigation measures could result in reduction and containment pacts to the development site									
	degree of impact on irreplaceable resources:	Moderate, impor	tance of surrour	nding natural ha	bitat increases	s with the loss	of habitat fron	n the site	Medium			
VISUAL												
	Nature of impact:	Stockpile highly	visible in the h			e structures. S emain perma		emain as perma	nent features, the			
	with	2	4	4	3	30	Low		Medium			
	without	3	5	6	5	70	High		Medium			
Permanent transformation of the landscape	degree to which impact can be The impact can be reversed by removal of the ash and restoring the vegetation to its original state (Not											
	degree of impact on irreplaceable resources:											

Table 9.4: Detailed assessment of identified cumulative impacts – Ash disposal facility

Potential		Extent	Duration	Magnitude	Probabili tv	Signific	cance	Status		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)	Confidence	
GROUND W	ATER									
		As	sh Disposal	Facility - A	II alterna	atives				
		Extent	Duration	Magnitude	Probabilit V	Signific	cance	Status		
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or - ve)	Confidence	
	Nature of impact:	will be most sev	ere during facilit	ry operation but secause leachate	which will like will continue	local groundwater quality even with the appropriate liner, whi likely persist in some form long after the ash disposal facility hand to be generated from the ash by natural rainfall percolationing / deposition has ended.				
Deterioration of	Without Mitigations	2	4	6	4	48	Medium	-	Medium	
groundwater quality due to	With Mitigation	2	4	4	4	40	Medium	-	Medium	
leachate from ash disposal facility	Degree to which impact can be reversed:	•		nd operation, an	•	maintaining gootating and maint	•		Medium	
	Degree of impact on irreplaceable resources:	resources are lim	nited and are the	eoretically repla enient alternativ	ceable with a	l to have alterna	vever, local gr	oundwater	Medium	
Rise in local water table and minor changes to local groundwater flow directions	Nature of impact:	water migratin infiltration and re	g downwards w charge characte ver. This may le	ter table under vill be lower. Hower eristics of the ow ad to a slight ris	the ash dispo wever, there erlying rehab e in water tak	sal facility should begin to decline again, singles likely to be a small residual effect on wate ilitated ash disposal facility will not be the sable and potential local changes in groundwat mor, and limited to the local area.			er table, since the same as those of the	

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signific	cance	Status	Confidence			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)	Confidence			
	Without Mitigations	2	4	4	4	40	Medium	-	Medium			
	With Mitigation	1	3	2	3	18	Low	-	Medium			
	Degree to which impact can be reversed:	will reduce move	The impact can be lessened by vegetating the ash disposal facility and preventing erosion etc, which vill reduce movement of water /leachate downwards once ash deposition has ceased. The full impact would be difficult to reverse however, since this would most likely involve removing the rehabilitated ash disposal facility.									
	Degree of impact on irreplaceable resources:	_	The degree of impact on irreplaceable resources is thought to be low, since local groundwater resources are limited and are theoretically replaceable with alternatives Medium									
Groundwater	Nature of impact:		Surface water that is being impounded near the ash disposal facility and which is polluted by runoff from the ash disposal cility may leak from surface water impoundments into surface water system, and infiltrate into groundwater some distance (most likely local area) from the ash disposal facility.									
contamination in local area due to	Without Mitigations	2	4	4	3	30	Low	-	High			
infiltration from	With Mitigation	1	2	2	2	10	Low	-	High			
surface water polluted by the ash disposal	Degree to which impact can be reversed:	Impact can be	reversed succes	ssfully if all surfa opriately design		•	in good condi	tion and	Medium			
facility.	Degree of impact on irreplaceable resources:	Impact likely to b	mpact likely to be on regional groundwater which may be expensive to replace if it is a sole source of supply to a nearby farm, for example. Medium									
SOILS AND	AGRICULTU	JRAL POTE	NTIAL									
		Ash Disposal Facility - Alternative A										
Potential Impact	Mitigation	Extent	Duration	Magnitude	Probabilit y	Signific	cance	Status	Confidence			

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signific	cance	Status	Confidence			
Impact	_	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)				
		(E)	(D)	(M)	(P)	(S=(E+D+	-M)*P)	(+ve or - ve)				
	Nature of impact:		Unava	ailability of soil r	esource for ag	griculture due t	o positioning	of ADF				
	without	1	5	10	5	80	High	-	Confident			
	with	1	5	10	5	80	High					
Loss of agricultural soil	degree to which impact can be reversed:	Impossible to	npossible to reverse as soils will be completely and permanently covered by ADF, in addition to existing ADF.									
	degree of impact on irreplaceable resources:	Absence of high p	ootential soils m		will not be a la ocal soil patte	_	of irreplaceab	le resources				
		A	sh Disposa	al Facility -	Alternativ	ve B						
		Extent	Duration	Magnitude	Probabilit V	Signific	cance	Status				
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+	⊦M)*P)	(+ve or - ve)	Confidence			
	Nature of impact:		Unava	ailability of soil r	esource for ag	griculture due t	o positioning	of ADF				
	without	1	5	10	5	80	High	-	Confident			
	with	1	5	10	5	80	High					
Loss of agricultural soil	degree to which impact can be reversed:	Impossible to	Impossible to reverse as soils will be completely and permanently covered by ADF, in addition to existing ADF.									
	degree of impact on irreplaceable resources:	Very probab	le absence of hig irreplac	gh potential soil eable resources			e a large-scale	loss of				

Potential		Extent	Duration	Magnitude	Probabili ty	Signif	icance	Status	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence
		A	Ash Disposa	al Facility -	Alternati	ve C			
Detential Impact	Mitigation	Extent	Duration	Magnitude	Probabilit y	Signit	ficance	Status	Cantidanas
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+I	D+M)*P)	(+ve or - ve)	Confidence
	Nature of impact:		Unava	ailability of soil r	esource for a	griculture due	to positioning	of ADF	
	without	1	5	10	5	80	High	-	Confident
	with	1	5	10	5	80	High		
Loss of agricultural soil	degree to which impact can be reversed:	Impossible to	reverse as soils	•	ely and perma ting ADF.	anently covere	dition to		
	degree of impact on irreplaceable resources:	Very probab	le absence of hig irreplac	gh potential soil eable resources				loss of	
SURFACE W	/ATER								
		A	sh Disposa	l Facility -	Alternativ	ve A			
		Extent	Duration	Magnitude	Probabilit y	Signif	ficance	Status	
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+I	D+M)*P)	(+ve or - ve)	Confidence
Decrease PES of wetland type and	Nature of impact:			bability of this c	hange relates	_	d EIS of the wet	change in wetland tion and of wetlands	
downstream	without	2	4	2	4	32	Medium	-	3
watercourse									

Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probabili ty (P)		ficance D+M)*P)	Status (+ve or - ve)	Confidence
	degree to which impact can be reversed:			Can not be	readily rever	sed		vej	3
	degree of impact on irreplaceable resources:				Low				3
		A	Ash Disposa	al Facility -	Alternati	ve B			
		Extent	Duration	Magnitude	Probabilit y	Signi	ficance		
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	Confidence	
	Nature of impact:			bability of this o	hange relates	-	nd EIS of the we		change in wetland tion and of wetlands
Decrease PES of wetland type and	without	2	4	6	5	60	Medium	-	3
downstream	with	2	3	6	4	44	Medium	-	3
watercourse	degree to which impact can be reversed:			Can not be	readily rever	sed		3	
	degree of impact on irreplaceable resources:				Low				3

Potential		Extent	Duration	Magnitude	Probabili tv	Signifi	icance	Status		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D)+M)*P)	(+ve or - ve)	Confidence	
		A	Ash Disposa	l Facility -	Alternati	ve C				
Detential Immed	Mikigakian	Extent	Duration	Magnitude	Probabilit y	Significance		Status	Confidence	
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)	Confidence	
	Nature of impact:			bability of this c	hange relates		I EIS of the wet		change in wetland tion and of wetlands	
Decrease PES of	without	2	4	4	4	40	Medium	-	3	
wetland type and	with	2	3	4	3	27	Low	-	3	
downstream watercourse	degree to which impact can be reversed:		3							
	degree of impact on irreplaceable resources:				Low				3	
BIODIVERS	SITY									
		A	Ash Disposa	I Facility -	Alternati	ve A				
Detential loop of	D.G.L.	Extent	Duration	Magnitude	Probabilit y	Signifi	icance	Status	Confidence	
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)	Confidence	
Cumulative impacts on	Nature of impact:		The Soweto Highveld Grassland is listed as Endangered and the continued loss of representative habitats will adversely impact on the conservation status of this unit							

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence		
conservation	without	4	5	8	5	85	High				
obligations &	with	4	5	8	5	85	High				
targets (including national and regional)	degree to which impact can be reversed:	The severity of th reversed	e impacts dictat	es that transfor	mation is pern	nanent and th	e loss of habita	at cannot be			
	degree of impact on irreplaceable resources:	Soweto Highveld degradation of th				possible, con	itinued loss and	d			
	Nature of impact:	Current transform habitat will result				pe is regarde	d severe and th	ne continued lo	ss of natural		
Cumulative	without	3	5	8	4	64	High				
increase in local	with	3	5	6	4	56	Medium				
and regional fragmentation/ isolation of	degree to which impact can be reversed:	The severity of the impacts dictates that transformation is permanent and the loss of habitat cannot be reversed									
habitat	degree of impact on irreplaceable resources:	Natural habitat is severely restricted and limited in the landscape and the continued loss of remaining portions of natural habitat will increase pressures on remaining portions									
Cumulative	Nature of impact:		Evidence indicates existing moderately significant impacts on surrounding areas of natural habitat. Existing impacts of augmented by extension of the present ashing facility, particularly in view of the proximity of sensitive habitat to some alternatives								
increase in	without	3	5	8	4	64	High				
environmental	with	3	5	6	3	42	Medium				
degradation, pollution	degree to which impact can be reversed:	Most of the expeding mitigation measu	•			nitigate. How	vever, with ded	icated			

Potential		Extent	Duration	Magnitude	Probabili ty	Signifi	cance	Status	0 51
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or - ve)	Confidence
	degree of impact on irreplaceable resources:	Degradation of re habitat to support	~ .		nsitive habitat	will place sign	ificant pressur	e on natural	
		A	sh Disposa	l Facility -	Alternativ	ve B			
		Extent	Duration	Magnitude	Probabilit y	Signifi	cance	Status	0 51
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	+M)*P)	(+ve or - ve)	Confidence
	Nature of impact:	The Soweto Highy impact on the cor			gered and the	continued loss	s of representa	itive habitats v	vill adversely
Cumulative	without	4	5	6	4	60	Medium		
impacts on	with	4	5	6	4	60	Medium		
conservation obligations & targets (including national and	degree to which impact can be reversed:	The severity of the reversed							
regional)	degree of impact on irreplaceable resources:	Soweto Highveld degradation of the				possible, cont	inued loss and		
Cumulative	Nature of impact:	Current transform habitat will result	_			pe is regarded	severe and th	e continued lo	ess of natural
increase in local	without	3	5	6	4	56	Medium		
and regional	with	3	5	4	3	36	Medium		
fragmentation/ isolation of habitat	degree to which impact can be reversed:	The severity of the reversed	e impacts dictat	es that transfor	mation is pern	nanent and the	loss of habita	t cannot be	

Potential		Extent	Duration	Magnitude	Probabili ty	Signif	icance	Status	0 51
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or - ve)	Confidence
	degree of impact on irreplaceable resources:	Natural habitat is portions of natura	•		•		ntinued loss of	remaining	
	Nature of impact:	Evidence indicate augmented by ext alternatives		• •	•				~ .
Cumulative	without	3	5	6	4	56	Medium		
increase in	with	3	5	4	3	36	Medium		
environmental degradation, pollution	degree to which impact can be reversed:	Most of the expect mitigation measure	•			nitigate. How	ever, with dedi	cated	
	degree of impact on irreplaceable resources:	Degradation of re habitat to support	• •		nsitive habitat	will place sigr	nificant pressur	e on natural	
		P	\sh Disposa	al Facility -	Alternativ	re C			
Potential Impact	Mitigation	Extent	Duration	Magnitude	Probabilit y	Signif	icance	Status	Confidence
rotentiai impact	Willigation	(E)	(D)	(M)	(P)	(S=(E+[D+M)*P)	(+ve or - ve)	Connuence
Cumulative impacts on	Nature of impact:	The Soweto Highy impact on the cor			gered and the	continued los	ss of representa	ative habitats v	vill adversely
conservation	without	4	5	8	4	68	High		
obligations &	with	4	5	8	4	68	High		
targets (including national and regional)	degree to which impact can be reversed:	The severity of the reversed	e impacts dictat	es that transfor	mation is perm	nanent and th	e loss of habita	t cannot be	

Minimaniam	Extent	Duration	Magnitude	Probabili ty	Signif	ficance	Status	Confidence		
Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or - ve)	Confidence		
degree of impact on irreplaceable resources:	Soweto Highveld (-receiand areas chould be concerved as far as nossible, continued loss and									
Nature of impact:	Current transform habitat will result	_			pe is regarde	d severe and th	e continued lo	ss of natural		
without	3	5	6	4	56	Medium				
with	3	5	4	4	48	Medium				
degree to which impact can be reversed:	The severity of th	severity of the impacts dictates that transformation is permanent and the loss of habitat cannot be								
degree of impact on irreplaceable resources:		Natural habitat is severely restricted and limited in the landscape and the continued loss of remaining portions of natural habitat will increase pressures on remaining portions								
Nature of impact:	Evidence indicate augmented by ex alternatives		, ,	•				~ .		
without	3	5	6	4	56	Medium				
with	3	5	4	3	36	Medium				
degree to which impact can be reversed:	•	Most of the expected impacts are unavoidable and difficult to mitigate. However, with dedicated mitigation measures the severity could be ameliorated								
degree of impact on irreplaceable resources:	Degradation of remaining portions of natural/sensitive habitat will place significant pressure on natural habitat to support biodiversity requirements									
on irrepl	aceable	aceable Degradation of re	aceable Degradation of remaining portion	aceable Degradation of remaining portions of natural/ sei	aceable Degradation of remaining portions of natural/ sensitive habitat	aceable Degradation of remaining portions of natural/ sensitive habitat will place sign	aceable Degradation of remaining portions of natural/ sensitive habitat will place significant pressur	aceable Degradation of remaining portions of natural/ sensitive habitat will place significant pressure on natural habitat to support biodiversity requirements		

Ash Disposal Facility - Alternative A

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Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence		
Impact		(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or - ve)			
	Nature of impact:	Adherence	to ambient noi	se levels listed b	y SANS 1010	3 for a rural di	strict, i.e. 45 dB	A (day) and 3	5 dBA (night).		
	without	2	4	2	3	24	Low	-	Definite		
	with	2	4	2	3	24	Low	-	Definite		
Noise	degree to which impact can be reversed:			Fully	reversible						
	degree of impact on irreplaceable resources:		No impact								
	Nature of impact:		Increase in present ambient noise levels								
	without	2	4	2	3	24	Low	-	Definite		
	with	2	4	2	3	24	Low	-	Definite		
Noise	degree to which impact can be reversed:										
	degree of impact on irreplaceable resources:			No	No impact						
		Į.	Ash Disposa	al Facility -	Alternati	ve B					
Dotontial lucus -t	Mitigation	Extent	Duration	Magnitude	Probabilit y	Signi	ficance	Status	Confidence		
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence		
Noise	Nature of impact:	Adherence	to ambient noi	se levels listed b	y SANS 1010	3 for a rural di	strict, i.e. 45 dB	A (day) and 3	55 dBA (night).		
NOISE	without	2	4	2	3	24	Low	-	Definite		

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence	
	with	2	4	2	3	24	Low	-	Definite	
	degree to which impact can be reversed:			Fully	reversible					
	degree of impact on irreplaceable resources:		No impact							
	Nature of impact:			Increa	se in present	ambient noise	elevels			
	without	2	4	2	3	24	Low	-	Definite	
	with	2	4	2	3	24	Low	-	Definite	
Noise	degree to which impact can be reversed:									
	degree of impact on irreplaceable resources:			No	impact					
			Ash Disposa	al Facility -	Alternati	ve C				
		Extent	Duration	Magnitude	Probabilit y	Signi	ficance	Status	0 51	
Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(F+I)+MI)*P)		(+ve or - ve)	Confidence	
	Nature of impact:	Adherenc	e to ambient noi	se levels listed k	y SANS 1010	3 for a rural di	strict, i.e. 45 dB	A (day) and 3	5 dBA (night).	
Noise	without	2	4	2	3	24	Low	-	Definite	
	with	2	4	2	3	24	Low	-	Definite	

Potential	Mitigation	Exte	ent	Duration	Magnitude	Probabili ty	Signifi	cance	Status	Confidence			
Impact	Mitigation	(E	(E) (D) (M) (P) (S=(E+D+M)*P))+M)*P)	(+ve or - ve)	Confidence						
	degree to which impact can be reversed:		Fully reversible										
	degree of impact on irreplaceable resources:		No impact										
	Nature of impact:		Increase in present ambient noise levels										
	without	2		2	2	3	18	Low	-	High			
	with	2		2	2	3	18	Low	-	High			
Noise	degree to which impact can be reversed:		Fully reversible										
	degree of impact on irreplaceable resources:				No	impact							
VISUAL													
Incremental cumulative	Nature of impact:	Cumul	ative impac	cts are likely t	o occur, but are	not regarded chara		nough to fund	damentally cha	inge the landscape			
impact with the	with												
addition of an ash disposal facility in	without	2	4	4	3	30	Lo	w	-	High			
the visual landscape where and existing facility is already visible and not regarded as part	degree to which impact can be reversed:			The	e impact cannot	be reversed							

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Significance	Status	Confidence
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or - ve)	Confidence
of the natural environment.								

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The above impact analysis is summarised in **Table 9.5 – 9.8**.

Table 9.5: Summary of identified impacts for the Construction Phase - Ash disposal facility

			Signif	ficance	
Potential Impact	Mitigation	Ash disp	osal facili	ty – Site	No-Go
		Α	В	С	
GEOLOGY					
	Without	Medium	Medium	Medium	
Construction-related earthworks	With	Low	Low	Low	
Pollution of geological features in case of	Without	Medium	Medium	Medium	N/A
spillage or leakage of hydrocarbon and other hazardous material	With	Low	Low	Low	
AGRICULTURAL POTENTIAL					
	Without	High	High	High	Low
Loss of agricultural soil	With	High	High	High	Low
GROUNDWATER					
Deterioration of groundwater quality due to	Without	Low	Low	Low	
spillages during construction	With	Low	Low	Low	N/A
SURFACE WATER					
	Without	Low	Medium	Medium	
Impacts on hydrology	With	Low	Medium	Medium	
	Without	Low	High	Medium	
Impacts on surface water quality	With	Low	Medium	Medium Low Medium Low High High Low Low Medium Medium	
	Without	Low	High	Medium	
Impacts related to erosion and sedimentation	With	Low	Medium	Medium	N/A
Impacts on wetland vegetation and	Without	Medium	High	Medium	
disturbance of wetland habitat	With	Medium	Medium	Low	
Impact related to increase alien/pioneer	Without	Low	Medium	Medium	
vegetation in disturbed areas	With	Low	Low	Low	
Impacts on residual wetland ecosystem	Without	Medium	High	Low	Medium
services	With	Medium	Medium	Low	Medium
BIODIVERSITY					
Impacts on flora species of conservation importance (including habitat suitable for	Without	High	Medium	High	
these species	With	Medium	Medium	Medium	
Impacts on fauna species of conservation	Without	High	Medium	High	
importance (including habitat suitable for these species)	With	Medium	Medium		N/A
Impacts on sensitive or protected flora &	Without	High	Medium	High	
fauna habitat types (including loss and degradation)	With	Medium	Medium	Medium	
Displacement of fauna species, human-animal	Without	High	Medium	High	
conflicts & interactions	With	Medium	Medium	Medium	

Impacts on ecological connectivity and	Without	High	Medium	High	
ecosystem functioning;	With	Medium	Medium	Medium	
In disease in a second and a second and a second and a second	Without	High	High	High	
Indirect impacts on surrounding habitat	With	Medium	Medium	Medium	
AVIFAUNA					
D: 1 1	Without	Medium	Medium	Medium	
Disturbance	With	Low	Low	Low	
	Without	Medium	Medium	Medium	N/A
Habitat Destruction	With	Medium	Medium	Medium	
BATS					
Roost disturbance and/or destruction due to	Without	Low	Low	Low	
construction activities	With	Low	Low	Low	
Disturbance to and displacement from	Without	Medium	Medium	Low	N/A
foraging habitat due to construction activities	With	Low	Low	Low	
HERITAGE					
Destruction of heritage sites and features	Without	Low	Low	Low	N/A
-	With	Low	Low	Low	N/A
VISUAL	1				
Transformation of the visual quality of the	Without	Low	Low	Low	N/A
landscape	With	Low	Low	Low	
SOCIAL	1				
Impact 1: Economic Development through employment	Without	Low	Low	Low	Medium
till odgir employment	With	Low	Low	Low	Low
Impact 2: Inflow of temporary workers	Without	Low	Low	Low	
Impact 2. Innow of temporary workers	With	Low	Low	Low	
Impact 3: Health Risk from elevated PM 10	Without	Low	Low	Low	N/A
Concentrations	With	Medium	Medium	Medium	N/A
Impact 4: Nuisance from elevated dustfall	Without	Low	Low	Low	
rates	With	Medium	Medium	Medium	

Table 9.6: Summary of identified impacts for the Operational Phase – Ash disposal facility

			Signif	icance	
Potential Impact	Mitigati on	Ash disp	osal facili	ty – Site	No-GO
		Α	В	С	
GEOLOGY					
Pollution of geological features in case of	Without	Medium	Medium	Medium	
spillage or leakage of hydrocarbon and other hazardous material	With	Low	Low	Low	
AGRICULTURAL POTENTIAL					
	Without	High	High	High	Low
Loss of agricultural soil	With	High	High	High	Low
GROUNDWATER					
Rise in local water table due to additional	Without	Medium	Medium	Medium	
recharge caused by ash deposition and possible concentration of recharge	With	Low	Low	Low	
Change in local groundwater flow directions due to possible rise in local	Without	Medium	Medium	Medium	
water table	With	Low	Low	Low	
Deterioration of groundwater quality due	Without	Low	Low	Low	N/A
to leachate from ash disposal facility	With	Low	Low	Low	
Groundwater contamination in local area	Without	Low	Low	Low	
due to infiltration from surface water polluted by the ash disposal facility.	With	Low	Low	Low	
Deterioration of groundwater quality due	Without	Low	Low	Low	Medium
to spillages of hydrocarbons	With	Low	Low	Low	Medium
SURFACE WATER					
	Without	Medium	High	Medium	
Impacts on hydrology	With	Medium	High	Medium	NI / A
	Without	Medium	High	Medium	N/A
Impacts on surface water quality	With	Medium	Medium	Medium	
BIODIVERSITY					
Impacts on flora species of conservation	Without	High	Medium	High	
importance (including habitat suitable for these species)	With	Medium	Medium	Medium	
Impacts on fauna species of conservation	Without	High	Medium	High	
importance (including habitat suitable for these species)	With	Medium	Medium	Medium	N/A
Impacts on sensitive or protected flora &	Without	High	Medium	Medium	
fauna habitat types (including loss and degradation)	With	Medium	Medium	Medium	
Impacts on ecological connectivity and	Without	High	Medium	High	
ecosystem functioning	With	Medium	Medium	Medium	

Displacement of fauna species, human-	Without	High	Medium	High		
animal conflicts & interactions	With	Medium	Medium	Medium		
	Without	High	Medium	High		
Indirect impacts on surrounding habitat	With	High	Medium	Medium		
AVIFAUNA						
Contamination of surrounding water.	Without	Medium	Medium	Medium	NI / A	
Contamination of surrounding water.	With	Low	Low	Low	N/A	
VISUAL						
Visual exposure of the newly introduced ash disposal facility	Without	Medium	Medium	Medium	N/A	
	With	Medium	Medium	Medium		
Transforming the visual quality and sense of place of the landscape	Without	Medium	Medium	Medium		
	With	Low	Low	Low		
SOCIAL						
Continued generation of electricity for the national grid	Without	High	High	High		
	With	High	High	High		
Health Risk from elevated PM 10 Concentrations	Without	Medium	Medium	Medium	N/A	
	With	Low	Low	Low	II/A	
Nuisance from elevated dustfall rates	Without	Medium	Medium	Medium		
	With	Low	Low	Low		

Table 9.7: Summary of identified impacts for the De-Commissioning Phase - Ash disposal facility

		Significance					
Potential Impact	Mitigat ion	Ash dis	No-GO				
	ĺ	Α	В	С			
GROUND WATER							
Deterioration of groundwater quality due	Without	Low	Low	Low			
to spillages during Decommissioning	With	Low	Low	Low			
Deterioration of groundwater quality due to leachate from ash disposal	Without	Low	Low	Low	N/A		
	With	Low	Low	Low			
Minor changes to local water table and local groundwater flow direction	Without	Low	Low	Low			
	With	Low	Low	Low			
Groundwater contamination in local area	Without	Low	Low	Low			
due to infiltration from surface water polluted by the ash disposal facility.	With	Low	Low	Low			
AGRICULTURAL POTENTIAL							
	Without	High	High	High	Low		
Loss of agricultural soil	With	High	High	High	Low		
SURFACE WATER							
Water Quality	Without	Medium	High	Medium	D1 / A		
	With	Low	Medium	Medium	N/A		
BIODIVERSITY							

Impacts on flora species of conservation	Without	Medium	Medium	Medium	
importance (including habitat suitable for these species)	With	Medium	Low	Low	
Impacts on fauna species of conservation	Without	Medium	Medium	Medium	
importance (including habitat suitable for these species)	With	Medium	Low	Low	N/A
Impacts on sensitive or protected flora &	Without	Medium	Low	Medium	
fauna habitat types (including loss and degradation)	With	Low	Low	Low	
Displacement of fauna species, human- animal conflicts & interactions	Without	High	Medium	High	
	With	Medium	Medium	Medium	
Impacts on ecological connectivity and	Without	High	Medium	High	
ecosystem functioning	With	Medium	Medium	Medium	
	Without	Medium	Medium	Medium	
Indirect impacts on surrounding habitat	With	Low	Low	Low	
VISUAL					
Permanent transformation of the landscape	Without	High	High	High	N/A
	With	Low	Low	Low	N/A

Table 9.8: Summary of identified cumulative impacts – Ash disposal facility

		Significance					
Potential Impact	Mitigation	Ash disposal facility - Site			No-GO		
		Α	В	С			
GROUNDWATER							
Deterioration of groundwater quality due to leachate from ash disposal facility	Without	Medium	Medium	Medium			
	With	Medium	Medium	Medium			
Rise in local water table and minor changes	Without	Medium	Medium	Medium	D1 / A		
to local groundwater flow directions	With	Low	Low	Low	N/A		
Groundwater contamination in local area due	Without	Low	Low	Low	ı		
to infiltration from surface water polluted by the ash disposal facility.	With	Low	Low	Low			
AGRICULTURAL POTENTIAL							
	Without	High	High	High	Medium		
Loss of agricultural soil	With	High	High	High	Low		
SURFACE WATER							
Decrease PES of wetland type and	Without	Medium	Medium	Medium	D1 / A		
downstream watercourse	With	Low	Medium	Low	N/A		
BIODIVERSITY							
Cumulative impacts on conservation	Without	High	Medium	High			
obligations & targets (including national and regional)	With	High	Medium	High	N/A		
Cumulative increase in local and regional	Without	High	Medium	Medium			

fragmentation/ isolation of habitat	With	Medium	Medium	Medium			
Cumulative increase in environmental	Without	High	Medium	Medium			
degradation, pollution	With	Medium	Medium	Medium			
VISUAL							
Incremental cumulative impact with the	Without	Low	Low	Low			
addition of an ash disposal facility in the visual landscape where and existing facility is already visible and not regarded as part of the natural environment.	With	N/A	N/A	N/A	N/A		

9.3 Final Specialist Conclusions

9.3.1 Air Quality

The following can be concluded from the air quality impact assessment:

- Particulate matter, as dust fall-out, PM₁₀ and PM_{2.5}, were identified as the pollutants of concern.
- Annual average ground-level concentrations of PM_{10} simulated by dispersion modelling did exceed NAAQS over an area ranging between 611 ha (Alternative C) and 949 ha (Alternative A). The number of sensitive receptors where exceedances are predicted ranges between 1 (Alternative C) and 4 (Alternative B).
- Exceedances of daily standards for PM₁₀ are expected lowest as a result of Alternative C.
- Irrespective of the alternative, effective and continuous application of the mitigation measures will be essential to maintaining compliance with the NAAQS.

9.3.2 Ground Water

The main impacts on groundwater of the proposed ash disposal facility are likely to be:

- Deterioration in water quality; and
- Rise in groundwater levels in the immediate vicinity of the ash disposal facility due to additional recharge and groundwater mounding, which may alter the local groundwater flow direction.

The numerical model results suggest that the movement of leachate away from the ash disposal facility as a groundwater plume should take place relatively slowly, with plume extents being generally less than 1 km from the ash disposal facility after 100 years.

The main way to mitigate these impacts is to maintain the ash disposal facility in good condition (especially the drainage system). Once the ash disposal facility is decommissioned, it should be re-vegetated to minimise infiltration and to improve runoff quality, and the drainage system maintained to reduce downward movement of leachate from the base of the ash disposal facility. Groundwater monitoring from suitable boreholes should be undertaken during all

phases of ash disposal and after closure. If required the numerical model could be updated with

new monitoring data.

In terms of the risk to groundwater, all three proposed alternative sites (A, B and C) present a

similar risk, although slight preference would be given to Sites B and C due to the higher

proportion of non-perennial water courses within their footprints compared to Alternative Site A.

9.3.3 Surface Water

The wetland assessment ascertained that most wetlands within the primary and secondary

study area are in a Modified state. The wetland study contributions to the screening and scoping

assessment assisted in the selection of the current alternatives assessed, in which large

drainage lines and areas reflected a greater probability of wetness and were avoided as far as

possible. This assessment complimented the screening and scoping assessment in that the

selection criteria further minimises perceived impacts on wetlands. Similarly, general and more

specific mitigation measures are provided for most anticipated impacts. The most significant

impacts from a wetland perspective are considered to be the loss of wetland habitat that falls

within the footprints of the proposed ash disposal facility and the risk of water quality

deterioration due to seepage and leakage of pollutants from the facility.

All reasonable Alternatives have been assessed and it is unlikely that these impacts will be

expressed with less significance anywhere else in the direct landscape than at Alternative A.

However, some residual impact will persist if Alternative A is selected which may be further

mitigated by avoiding as much wetland habitat as is reasonably possible. A possible

consideration might be to combine parts of Alternative A and C. It is however, recommended

that ashing footprint be kept within the catchment of wetlands 6 and 10.

9.3.4 Biodiversity

Based on the disparity of habitat types within each of the site alternatives, as well as the

requirement of approximately 800 ha for the proposed development, it is strongly suggested

that suitable portions (moderate to low floristic and faunal sensitivity) be used for development

purposes. It is important to note that habitat of medium-high and high floristic and faunal

sensitivity be excluded as well as placing the proposed ashing facility as far away from the

sensitive wetland habitat type situated south of Alternative A.

9.3.5 Soils & Agriculture

As discussed above, the main impact of the establishment of an extension to the ADF would be

the loss of several hundred hectares of potentially arable land. The low to moderate (at best)

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potential of the majority of the soils under consideration means that this impact would not be of

the highest significance. However, a definite area of concern is the fact that there are wetlands

in the central part of the area, where the Wolwespruit flows southward, eventually joining the

Vaal River in the Grootdraai Dam some 15 km to the south.

Wetland soils are among the most fragile and most important of soils due to their position in the

landscape and their function in stabilizing and regulating the wetland ecosystem. The presence

of permanent wetlands in the area is thus somewhat of a cause for concern. Here, great care

must be taken to avoid contamination of the watercourse by waste material, which should be

planned in conjunction with hydraulic engineers and/or groundwater specialists.

Along the edge of the existing ADF, chemical precipitation can be seen, as well as around the

shores of the dams in the large wetland. This situation, and the potential exacerbation thereof,

needs to be investigated further. The clayey nature of the soils means that any runoff from an

extension to the ADF will percolate very slowly through the soil profile, giving ample time for

precipitation from solution and deposition on the surface or in the soil.

The quantification of this situation, as well as possible solutions, needs to be done in

conjunction with hydrologists and/or groundwater specialists.

9.3.6 Avifauna

No fatal flaws have been identified in terms of avifauna and the proposed ash disposal facility

can be built on any of the three alternatives, provided that the various mitigation measures

recommended in this report are implemented. However, from an avifaunal perspective, site

alternatives C is preferred for development. The greatest impact of the proposed project is

likely to be that of habitat destruction, while leachate from fly ash, into water systems used by

avifauna is also of concern. Furthermore the following conclusions and recommendations are

made:

Habitat destruction and disturbance are impacts that are associated with all activities of

the proposed project; however they are not expected to be highly significant, and should

be mitigated for as per this report and the use of the Construction EMP.

An "avifaunal walk through" by an avifaunal specialist, of the chosen site prior to

construction/extension is recommended in order to identify potential breeding sites or

nests of focal species.

9.3.7 Bats

Any species that occurs in the area of the proposed continuous disposal of ash at the Tutuka

Power Station is vulnerable to disturbance and/or displacement as a result of the construction. At

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least one of the bat species identified as potentially occurring in the area of the study site is Vulnerable (*Cleotis percivali*), four Near Threatened (*Hipposideros gigas, Miniopterus natalensis, Rhinolophus blasii* and *Rhinolophus swinnyi*) and seven Least Concern. Acoustic recording confirmed that at least two of the bats occurring in the area were present on the site (*Neomicia capensis* and *Tadarida aegyptiaca*). The uniformity of the habitat around the site also means that localized habitat destruction and disturbance would impact on bats but the habitat is not unique or important for bats and as such the surrounding habitats would be equally available to bats to utilize. The overall impact of the development on the bat population in the area is likely to be low, particularly if steps to mitigate impacts are taken.

Of the three site alternatives, alternative C would be preferred over site alternatives A and B because it is the only one that does not offer any appropriate roost sites for bats. Every effort should be made to mitigate the impacts on bats during this project through a construction EMP as well as by following the recommendations in this report.

9.3.8 Noise

Based on the findings of this noise study the drawn conclusions are:

- The extent of the significant noise impact, i.e. where the increase in ambient noise level will be equal or less than 3 dB, is limited to within approximately 560 m from the boundary of each of the alternatives;
- There are only four farmsteads where the increase in ambient noise level could be in excess of 3 dB. Without exception these are located right at the boundary of the respective alternatives;
- For each of the investigated alternatives and phases the significance rating is LOW; and
- In terms of their noise impacts the preferred site is Alternative C, while the rest are acceptable.

9.3.9 Heritage

The aim of the survey was to locate, identify, evaluate and document sites, objects and structures of cultural significance found within the area of the proposed development, to assess the significance thereof and to consider alternatives and plans for the mitigation of any adverse impacts.

9.3.10Visual

The proposed extension of an ash disposal facility for Tutuka Power Station is required to continue power generation at the plant.

The visual quality of the receiving environment has already been modified by views of the power station and associated infrastructure, which includes the ash disposal facility South of the power station. The power station dominates views in the foreground and middle ground, with the ash disposal facility less visible and largely integrated into the topography of the area.

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The severity of impact is influenced by the perception of viewers, which is assumed to be

neutral. The visual absorption capacity of the environment is assessed to be sufficient to

integrate the facility into the existing landscape, provided the preferred site is chosen and

proposed mitigation measures are carried out.

It is concluded that the visual impact of the proposed development is high in places, but can be

mitigated by selecting the option with the least effect on sensitive receptors and implementing

the proposed mitigation measures.

9.3.11 Social

The proposed ash disposal facility may result in water and air pollution, which in turn will have

impacts on the health of humans, animals and crops. The ash facility needs to be 1.5km away

from any settlements, and 3 to 5km away in the prevailing wind direction. Impacts on animals

and crops would lead to negative economic impacts. It will, however, also have a positive

impact on meeting electricity demands.

The impacts are already present in this case and the social impact process determined whether

anything substantial will change on the social side with the continued extension of the ash

disposal facility.

Although there are not many potential social impacts that can occur as a result of the project

(as this is a proposed continuation of an already existing waste facility), the impacts, if they do

occur, will not be severe. It is, however, still imperative that mitigation measures are

implemented to prevent any negative impacts from occurring.

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9.4 Site Preference Rankings

Table 9.9: Averages and weighted averages indicating the preferred site.

SPECIALIST	Weight		SITE		
		Α	В	С	
Air	2.26	3	2	4	
Groundwater	2.35	3	3	3	
Bats	2	3	3	4	
Birds	2	3	3	4	
Heritage	1.55	3	3	3	
Social	1.61	3	3	3	
Noise	1.32	3	3	4	
Agric	1.74	4	3	3	
Surface Water	2.29	4	2	3	
Biodiversity	2.19	2	4	3	
Visual	1.55	3	4	2	
		2.428571	2.357143	2.571429	Average
		59.59	56.94	63.78	
		5.959	5.694	6.378	Weighted Average

Table 9.9 is a summary of the preferences of all the individual specialist studies. The studies have been combined and weighted averages has been calculated based on the method and discipline specific weights as proposed in the original Plan of Study.

Alternative C has been identified as the most suitable alternative with the least significant Environmental impacts across all disciplines (Figure 9.1).

Alternative A as the second most preferred alternative could be used if the required airspace could not be accommodated in **Alternative C**. Using a combination of these two alternatives should incorporate the recommendation from the Wetlands specialist with regard to the avoidance of certain Wetland areas.



Figure 9.1: Location of the three alternatives that formed part of the primary study area for the Tutuka Continuous ADF.

9.5 Impact Assessment Conclusions

9.5.1 Construction phase impacts

Some significant impacts has been identified that will occur during the construction phase. This is especially applicable to the Biodiversity, Surface Water and the loss of Agricultural Potential. Most of these could be reduced to Medium significance following mitigation. The only residual impact with high significance is the loss of Agricultural potential. The impacts are relatively evenly distributed amongst all of the site alternatives.

With this in mind it is important to realise that the alternatives itself has been identified as areas with the minimum impact on the Environment in relation to the study area. This has been done by incorporating the results from all the different specialist studies.

This means that although there will be significant biodiversity impacts by using the Alternative C, the cumulative impacts on all aspects studied will most probably be less than for any other area within the 8 km radius.

9.5.2 Operational phase impacts

As with the Construction phase all but two impacts between Biodiversity and the Wetlands

assessment (most significant impacts in these disciplines) can be mitigated to Medium significance. The impact on Hydrology and the impact on the surrounding Environmental

remain high following mitigation. The Groundwater report describe the residual impact on

Hydrology in detail.

The other residual impact with High significance during the operational phase, is the irreversible

loss of Agricultural soil. This impact will be relevant to any area identified for disposal and the impact has been minimised as far as possible by selecting the lowest possible agricultural

potential soils.

9.5.3 Decommissioning phase impacts

No new impacts will be introduced during the decommissioning phase with high significance. By

aligning operations with all mitigations proposed in the Environmental Management plan

impacts will be minimised as far as possible. After De-commissioning these impacts are

expected to decrease in Severity.

The only impact remaining after decommissioning with High significance is the loss of

Agricultural soil which has been provisioned for by selecting the lowest potential soils for the

facility.

9.5.4 Cumulative Impacts

Cumulative impacts on conservation objectives and targets have been identified as the most

important biodiversity impact. This together with the loss of Agricultural land can be raised as

the most important cumulative impacts of the Tutuka Continues Ash Disposal Facility project.

Taking into account the post mitigation impacts of the proposed **Alternative C** as well as the preference rankings from the various specialists it is clear that this alternative C, see **(Figure**

9.1), is the preferred alternative for the project. It is important to realise that as with all the

other alternatives some wetlands will be affected by using this area.

Alternative A has been identified as the second most preferred alternative based on

Environmental considerations. A combination of these two alternatives would increase the footprint area of the facility but could provide more leeway for the avoidance of sensitive areas

on both alternatives such as Wetlands and Dams.

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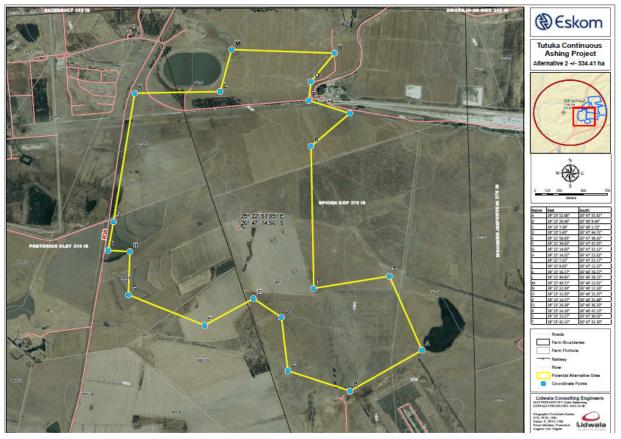


Figure 9.2. Proposed footprint (area) for the Tutuka Continuous Ash Disposal facility based on the findings of the EIA studies (Alternative C).

Taking all the various factors and studies into account the EAP propose a layout as indicated in the conceptual design **Appendix C**. This design incorporates all the Environmental sensitivities to achieve a "least environmental cost" solution that is still practical and financially feasible. It is therefore recommended by the Environmental Assessment Practitioner that the proposed option are approved subjected to the implementation and monitoring of all the mitigation measures as listed in the specialist studies and carried over to the Environmental Management Programme.