9 IMPACT ASSESSMENT

9.1 Introduction

The significant environmental impacts identified in the Scoping Phase as well as any newly identified impacts have been assessed during the EIA phase.

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 Wet ash disposal facility at the Hendrina 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);
 - 8 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					
	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 mainta	High	where the impact must have an influence on the					
	nigii	decision process to develop in the area					

The findings of the impact assessment have been consolidated into **Table 9.1** to **Table 9.12** 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, 9.2 and 9.3**), operational phase (**Table 9.4, 9.5 and 9.6**), decommissioning phase (**Tables 9.7, 9.8** and **9.9**) and the cumulative impacts (**Table 9.10, 9.11 and 9.12**)

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or - ve)	Confidence			
			Wet a	sh disposal fa	cility - Site	E						
GEOLOGY												
	Nature of impact:	Construction rel	ated earthworks	s may impact th	e local geolo	gy if not unde	rtaken in accord	dance to rele	vant procedures.			
	with mitigation	1	3	2	2	12	Low	Neutral	High			
Impact 1: Construction-	without mitigation	2	5	4	4	44	Medium	-	High			
related earthworks	degree to which impact can be reversed:	Low	w									
	degree of impact on irreplaceable resources:	Low	Low									
Impact 2: Pollution of	Nature of impact:	Spillages and leaks from fuels, oil and other potentially hazardous substances (including leaks from Ash pipes) 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							High			
AGRICULTURAL	POTENTIAL											
Impact 1: Loss	Nature of impact:	Adverse impact	due to the loss	of 209 ha of hig	gh agricultura	al land due to	the constructior	n of the wet a	ash disposal facility			
of agricultural	with mitigation	1	5	10	5	80	high	-	High			
land	without mitigation	1	5	10	5	80	high	-	High			

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

Potential Mitigation		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
	degree to which impact can be reversed:	Low							High			
	degree of impact on irreplaceable resources:	High	igh									
	Nature of impact:	Construction ac redistributed	tivities will requ	ire that the top	soil is strippe	ed and stored,	which may res	ult in some to	op soil being lost or			
	with mitigation	1	4	2	2	14	Low	-	High			
Impact 2: Loss	without mitigation	1	5	6	4	48	Medium	-	High			
or redistribution of top soil	degree to which impact can be reversed:	Medium		High								
	degree of impact on irreplaceable resources:	High							High			
GROUND WATER	t											
	Nature of impact:	Rainwater perco and most likely other impacts)	lating through a lead to deterior	ash together wil ation in local gr	th slurry or s oundwater qu	upernatant wa uality (likely to	ter will migrate raise the pH a	downwards nd raise the	towards the water table TDS value, amongst			
Impact 1:	with mitigation	1	2	2	5	25	Low	-	High			
Deterioration of	without mitigation	2	4	2	5	40	Medium	-	High			
quality due to leachate	degree to which impact can be reversed:	It will be difficu much as possib	It to reverse this le by installing a	s impact. It is m a liner systems	ore feasible that works a	to reduce the s designed.	amount of leach	nate as				
	degree of impact on irreplaceable resources:	Since the impact is likely to be on local groundwater only, and this resource can be replaced, the degree of impact is likely to be low.										
Impact 2: Deterioration of	Nature of impact:	Spillages of hydrocarbons (e.g. diesel) or solvents or other pollutants during the construction phase may have an impact on the quality of local groundwater resources.										
groundwater	with mitigation	1	2	2	1	5	Low	-	Medium			
quality due to spillages during	without mitigation	2	4	2	3	24	Low	-	Medium			

Potential	Mitiration	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
construction	degree to which impact can be reversed:	Once fuel, solve impact is difficu However, if app refuelling and fu threat of this im	nts or other pol It and expensive ropriate precaut uel storage area upact can be nea	lutants are spille e - i.e. the degre cions are taken s, control of all arly eliminated.	ed and begin ee to which t during the co potentially p	to migrate do he impact can onstruction pha olluting substa	wnwards, reven be reversed is ase (e.g. the bu ances at the site	rsing the low. Inding of e), the				
	degree of impact on irreplaceable resources:	Since the impac degree of impac	t is likely to be t is likely to be	on local ground [.] Iow	water only, a	and this resour	rce can be repla	ced, the				
	Nature of impact:	There is likely to downwards thro amount of pene	be a small rise ough the ash and tration is still ex	in the water ta soil zone into pected.	ble in the vio the groundw	cinity of the we ater. The line	et ash disposal i r will minimise i	facility due to this impact, a	water percolating although a certain			
	with mitigation	1	1	2	4	16	Low	-	Medium			
<i>Impact 3:</i> Rise in water table	without mitigation	2	1	2	4	20	Low	-	Medium			
during initial slurry deposition	degree to which impact can be reversed:	The impact can downwards ceas during the const	The impact can only be fully reversed once slurry deposition and percolation of extra water downwards ceases completely. Since slurry deposition and / or dry ash deposition will be carried out during the construction phase, the degree to which the impact can be reversed is thought to be low.									
	degree of impact on irreplaceable resources:	Minor										
SURFACE WATE	R											
	Nature of impact:	The loss of asso including sedime alternative E wit	ciated wetland f ent; and to a sn th still provide t	functions which nall extent flood hese functions	include: Nut attenuation	rient removal and stream fl	(particularly Nit ow augmentatic	rates); trapp on as the dan	ing of pollutants, n located to the north of			
	with mitigation	2	3	4	3	27	Low	-	Medium			
Impact 1: Loss	without mitigation	4	5	8	5	85	High	-	High			
of wetland function	degree to which impact can be reversed:	The associated i above) that hav	impacts can be re been lost by t	reversed to an e he removal of t	extent by fulf he wetland s	filling the func ystems.	tions (as mentio	oned	Medium			
degree of impact on irreplaceable resources: The degree of impact can be kept low if the run-off from the wet ash disposal facility is managed adequately and prevented from leaving the facility area, and by ensuring that the drainage system/networks are regularly maintained. This will be ensured through the Eskom zero liquid effluent discharge philosophy and will be monitored throughout the lifecycle of the facility.									Medium			
Impact 2:	Nature of	Hydrocarbons (oil and diesel et	c.), solvents and	d other pollu	tants spilling/l	eaking from \overline{cor}	nstruction ma	chinery and equipment			

Potential		Extent	Duration	Magnitude	Probabili ty	Signif	ficance	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
Deterioration of	impact:	during the const	truction phase n	nay have an im	bact on the r	eceiving aquat	ic environment		·			
water quality	with mitigation	3	3	4	2	20	Low	-	Medium			
	without mitigation	4	5	6	4	60	Medium	-	Medium			
	degree to which impact can be reversed:	(e.g. Bioremediation etc.) immediately following a spill the degree and extent of the impacts can be significantly reduced. These measures are however a very costly exercise.										
	degree of impact on irreplaceable resources:	The degree of the mitigation meas impact.	The degree of the impact will be directly related to the extent of the spill/leak. With appropriate mitigation measures in place the probability of this impact can be reduced drastically to a low High impact.									
	Nature of impact:	Increased run-o	ff may contribut	te to the spread	of pollutants	s, exacerbate e	erosion potentia	al and lead to	sedimentation.			
Impact 3.	with mitigation	1	2	4	2	14	Low	-	Medium			
Increased	without mitigation	3	4	6	4	52	Medium	-	Medium			
within the wet ash disposal facility	degree to which impact can be reversed:	The degree of the mitigation meas	equate	Medium								
	degree of impact on irreplaceable resources:	The probability of implementing approximation in reduce its velocities velocities in the second se	High									
	Nature of impact:	Alter the water of marginal habitat	quality (increase ts due to excess	ed turbidity) and sive reed growth	d substrate c and alien ve	omposition of egetation encr	receiving aquat pachment as a	ic environme result of the	ents as well as altering deposited sediment.			
	with mitigation	1	2	2	1	5	Low	-	High			
Impact 4:	without mitigation	3	3	8	4	56	Medium	-	Medium			
Erosion and Sedimentation	degree to which impact can be reversed:	The degree in w however, if appr the threat of thi	hich these impa ropriate mitigati s impact can be	octs can be reve on is put into p considerably lo	rsed will be l ace and enfo wered.	ow if not hand prced througho	led appropriate out the construc	ly, tion phase	High			
	degree of impact on irreplaceable resources:	The degree of the berms, etc.) bef ash disposal fac	ne impact will be fore and through ility.	e very low if erc nout the constru	sion control Iction phase	measures are and throughou	put into place (It the lifespan o	silt fences, If the wet	Medium			
Impact 5: Altered hydrology	Nature of impact:	The placement of the wet ash disposal facility will alter natural surface water flow paths by changing the local topography and breaking longitudinal and lateral connectivity of the drainage network. This could potentially affect surface and sub-surface flow volume by reducing base flows or augmenting streamflow.										

Potential		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 mitigation	2	3	4	3	27	Low	-	Medium			
	without mitigation	3	4	8	5	75	High	-	Medium			
	degree to which impact can be reversed:	This impact can in order to the s	Wetland 1	Medium								
	degree of impact on irreplaceable resources:	The degree of the impact will be low-moderate if appropriate mitigation is implemented. It should however be taken into account that hydrology of the associated wetland system is already severely altered by several dams and water being decanted into the system from where?.										
	Nature of impact:	The construction downstream da	he construction of the ash disposal facility may result in lowered base flows which may cause the water level in the lownstream dam to lower considerably due to the loss of the catchment area to the wet ash disposal facility.									
Impact 6: Loss	with mitigation	3	4	4	3	33	Medium	-	Medium			
of water	without mitigation	3	4	6	5	65	High	-	High			
downstream to downstream	degree to which impact can be reversed:	It will be almost will be lost once	lternative E	Medium								
	degree of impact on irreplaceable resources:	The degree of the area will be lost that the dam wi	tchment Id be noted	Medium								
BIODIVERSITY												
	Nature of impact:	Adverse Impact	due to loss of r	atural habitat.								
	with mitigation	2	5	2	5	45	Medium	-	high			
Impact 1: Loss or degradation	without mitigation	2	5	2	5	45	Medium	-	high			
of natural/ pristine habitat	degree to which impact can be reversed:	None							high			
	degree of impact on irreplaceable resources:	Low							high			
Impact 2: Direct impacts on	Nature of impact:	Adverse Impact due to faunal interactions with structures, infrastructure										
common fauna,	with mitigation	2	5	2	3	27	Low	-	high			
				9-8								

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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			
interactions with structures and	without mitigation	2	3	4	5	45	Medium	-	high			
personnel	degree to which impact can be reversed:	High	High									
	degree of impact on irreplaceable resources:	npact eable Moderate										
	Nature of impact:	Adverse Impact	/erse Impact due to disruption of ecological connectivity									
	with mitigation	2	5	2	5	45	Medium	-	high			
Impact 3: Loss or disruption of	without mitigation	2	2 5 2 5 45 Medium -									
ecological connectivity	degree to which impact can be reversed:	None		high								
	degree of impact on irreplaceable resources:	Low							high			
	Nature of impact:	Adverse Impact	due to habitat	degradation		-						
	with mitigation	2	3	2	4	28	Low	-	high			
<i>Impact 4:</i> Loss/ Degradation of	without mitigation	2	5	2	5	45	Medium	-	high			
surrounding habitat, species	degree to which impact can be reversed:	Moderate							high			
	degree of impact on irreplaceable resources:	Low							high			
AVIFAUNA												
<i>Impact 1:</i> Disturbance of	Nature of impact:	Noise and move	ment, from stat	ff and machiner	y, may distur	rb avifauna, ar	nd nests may be	e disturbed.				
Disturbance of avifauna	with	2	1	2	3	15	Low	-	Medium			
	without	2	1	4	4	28	Low	-	Medium			
				9-9								

Potential Mitigation		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	0 - a fi d - a - a -			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
	degree to which impact can be reversed:	Partially reversi	ble						Medium			
	degree of impact on irreplaceable resources:	Low	LOW									
	Nature of impact:	Permanent remo	ermanent removal of natural habitat that is used, or may be used, by avifauna.									
	with	1	5	4	5	50	Medium	-	Medium			
Impact 2:	without	1	5	4	5	50	Medium	-	Medium			
destruction	degree to which impact can be reversed:	Irreversible		Medium								
	degree of impact on irreplaceable resources:	degree of impact on irreplaceable medium resources:										
HERITAGE												
	Nature of impact:	Adverse impact on a graves on the proposed site										
	with mitigation	3	5	2	5	50	Medium	-	High			
Impact 1: Destruction of	without mitigation	3	5	10	5	90	High	-	High			
heritage sites and features	degree to which impact can be reversed:	Medium							High			
	degree of impact on irreplaceable resources:	Not Applicable							High			
VISUAL												
Impact 1: Potential visual	Nature of impact:	Sof Visual impact due to vegetation clearing, earthworks, stockpiles, lay down areas, heavy vehicles, dust & rehabilitation										
impact of	with mitigation	4	1	6	2	22	Low	-	High			
construction on sensitive visual	without mitigation	4	1	6	3	33	Medium	-	High			

Potential	Mitication	Extent	Duration	Magnitude	Probabili ty	Signif	icance	Status	Confidence			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+I	D+M)*P)	(+ve or - ve)	Confidence			
receptors (i.e. users of roads and residents of	degree to which impact can be reversed:	Recoverable										
homesteads and settlements) in close proximity to the proposed wet ash disposal facility	degree of impact on irreplaceable resources:	None										
Impact 2: Potential visual	2: Nature of impact: Visual impact due to vegetation clearing, earthworks, stockpiles, laydown areas, heavy vehicles, dust & r											
impact of	with mitigation	3	1	4	1	8	Low	-	High			
sensitive visual	without mitigation	3	1	4	2	16	Low	-	High			
receptors (i.e. users of roads and residents of	degree to which impact can be reversed:	Recoverable	Recoverable									
settlements) within the region	degree of impact on irreplaceable resources:	None										
SOCIAL												
	Nature of impact:	The impact is control of the imployees. How	nsidered to mir wever where ou	nor, although po tside contractor	sitive, as mo s are require	ost of the work	will be underta velopment will	ken by interi be positively	nal / existing Eskom impacted.			
	with mitigation	3	3	4	3	30	Low	+	Medium			
Impact 1: Economic	without mitigation	2	2	2	3	18	Low	+	Medium			
Development through employment	degree to which impact can be reversed:	Moderate							medium			
	degree of impact on irreplaceable resources:	Not Applicable							-			
<i>Impact 2:</i> Inflow of	Nature of impact:	Any construction activity will attract those looking for work and it is considered likely that there will be an influx of temporary workers seeking employment										
temporary	with mitigation	2	2	2	3	18	Low	-	Medium			
				9-11								

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Potential		Extent	Duration	Magnitude	Probabili ty	li Significance		Status	Confidence	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence	
workers	without mitigation	2	2	2	3	18	Low	-	Medium	
	degree to which impact can be reversed:	Moderate							Medium	
	degree of impact on irreplaceable resources:	Not Applicable							-	
	Nature of impact:	The construction	n phase of the n	iew wet ash disp	oosal facility	will result in ir	creased PM10	concentration	s due to groundworks	
	with mitigation	1	4	-	Medium					
Impact 3: Health Risk from without 2 4 6 4 48 Medium -									Medium	
elevated PM 10 Concentrations	degree to which impact can be reversed:	ree to which Medium act can be High – with the implementation of the relevant mitigation measures ersed: Medium								
	degree of impact on irreplaceable resources:	Not Applicable							-	
	Nature of impact:	The construction	n phase of the n	ew wet ash disp	oosal facility	will result in ir	ncreased dust fa	III rates due t	o groundworks	
	with mitigation	1	4	4	3	27	Low	-	Medium	
<i>Impact 4:</i> Nuisance from	without mitigation	2	4	6	4	48	Medium	-	Medium	
elevated dustfall rates	degree to which impact can be reversed:	High – with the	implementation	of the relevant	mitigation n	neasures			Medium	
	degree of impact on irreplaceable resources:	Not Applicable							-	
			Wet ash dis	posal facility -	No-Go Alte	rnative				
GEOLOGY										
In the event that	the Wet ash disposal f	facility is not cons	structed, there v	vill be no impac	t on the und	erlying geology	, therefore the	status quo w	vill remain.	
AGRICULTURAL	AGRICULTURAL POTENTIAL									
				9-12						

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			
In the event that t question, therefor	he Wet ash disposal f the status quo will r	acility is not cons emain.	tructed, there v	vill be no impact	t from ashing	g operations of	n the existing a	gricultural po	tential of the land in			
GROUND WATER	1											
	Nature of impact:	If the wet ash d underlying the p	isposal facility is proposed site, be	s not built, then oth in terms of o	it is likely th quality and g	hat there will b proundwater qu	e no change to uality.	the groundw	ater 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:	This positive impactivity affected	s positive impact (i.e. not building the wet ash disposal facility) could be reversed if some future ivity affected the groundwater underlying the proposed site.									
degree of impact on irreplaceable resources: Groundwater resource near the proposed site is not considered to be irreplaceable, in the sense that alternative sources of water can be found if needed.												
SURFACE WATER												
	Nature of impact:	The impacts ass hydrological alte	ociated with Alt erations.	ernative E in its	current stat	e include: agr	icultural and inc	lustrial impac	cts as well as severe			
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:	The impacts ass to their altered s	ociated with the state	e wetlands in the	e primary stu	udy area will n	ot be easily rev	ersed due	Medium			
	degree of impact on irreplaceable resources:	The state of the result of anthrop	wetlands locate pogenic activitie	ed within the pri is taking place in	mary study and the surrour	area is already nding catchme	v in an impacted nt	l state as a	High			
BIODIVERSITY												
In the event that t	he wet ash disposal f	acility is not cons	tructed, no biod	liversity impacts	are expecte	ed and the stat	us quo will rem	ain being dri	ven by current drivers.			
AVIFAUNA												
In the event that the Wet ash disposal facility is not constructed, no avifauna impact can be expected and the status quo will remain being driven by current drivers.												
HERITAGE												
In the event that the Wet ash disposal facility is not constructed, no Heritage impact can be expected as the grave will not be disturbed and the status quo will remain being driven by current drivers.												

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	0		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	·D+M)*P)	(+ve or - ve)	Confidence		
VISUAL											
In the event that	the Wet ash disposal	facility is not cons	structed, no visu	ual impact can b	e expected a	and the status	quo will remain	driven by th	e current drivers.		
SOCIAL											
	Nature of impact:	In the event that lose their jobs.	at the Power Sta	ation should clos	se in the futu	re as a result	of lack of ashin	g space, man	iy Eskom employees may		
	with mitigation	2	3	4	3	27	Low	-	Medium		
Impact 1: Loss of economic potential	without mitigation	2	2 3 6 4 44 Medium -								
	degree to which impact can be reversed:	Moderate – this implemented. A area which could	e tivity in the	medium							
	degree of impact on irreplaceable resources:	Not Applicable							-		
	Nature of impact:	If the wet ash d facilities are at t in further shorta	lisposal facility is their full capacit ages in power si	s not constructe y, this is expect upply for the co	ed the power ted to be 201 untry.	station will ne 18 at the curre	eed to be closed ent rates of ash	once the exi disposal. Suc	isting wet ash disposal ch a situation will result		
Impact 2:	with mitigation	No mitigation							High		
Continued supply of	without mitigation	4	4	6	5	70	High	-	High		
electricity from Hendrina power station	degree to which impact can be reversed:	Moderate – this constructed	impact can only	y be avoided an	d reversed if	the new wet a	ash disposal fac	ility is	High		
	degree of impact on irreplaceable resources:	Not Applicable -									

Probabili Extent Duration Magnitude Significance Status Potential ty Mitigation Confidence Impact (+ve or -(E) (D) (M) (P) (S=(E+D+M)*P)ve) **Power Line Corridor 3 GEOLOGY** Spillages and leaks from fuels, oil and other potentially hazardous substances during handling, use and storage can be kept to Nature of Impact 1: a minimum by applying a good housekeeping approach and observing and implementing the relevant mitigation measures. impact: Pollution of with mitigation 1 1 2 2 8 Low Neutral Hiah geological without features in case 3 3 4 6 39 **Medium** High mitigation of spillage or degree to which leakage of impact can be Medium Low hydrocarbon reversed: and other degree of impact hazardous on irreplaceable Low High material resources: **AGRICULTURAL POTENTIAL** Nature of Construction activities will require that the top soil is stripped and stored, which may result in some top soil being lost or redistributed impact: 4 2 2 with mitigation 1 14 Low _ High without 5 6 4 1 48 Medium Hiah Impact 1: Loss mitigation or redistribution dearee to which of top soil impact can be Medium High reversed: degree of impact on irreplaceable High High resources: **GROUND WATER** Nature of It is possible that construction of the power lines could lead to local deterioration in groundwater quality if pollutants of any Impact 1: impact: sort are spilled or introduced into the holes needed for the pylons during construction. Possible 2 2 2 deterioration in with mitigation 1 6 Low medium _ local without 2 4 4 1 10 Low _ medium aroundwater mitigation

Table 9.2: Detailed assessment of identified impacts for the Construction Phase – Power Lines

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	0			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
quality	degree to which impact can be reversed:	Once pollutants necessitating re risk can be almo	are introduced -excavation, etcost completely a	into the ground c. If appropriate avoided.	, reversing the precautions	ne impact wou are taken how	Ild be fairly diffi vever, it is likely	cult - / that the				
	degree of impact on irreplaceable resources:	The groundwate sense that alter	er resource alon native sources o	g the power line of water could b	e route is not e found if ne	considered to eded.	be irreplaceab	e, in the				
SURFACE WATE	R											
	Nature of impact:	The construction water contamina machinery and	construction of power lines witch cross through Wetlands 1 and 2 and runs alongside Wetlands 4 creats the er contamination by hydrocarbons (oil and diesel etc.), solvents and other pollutants spilling/leaking from co hinery and equipment during the construction phase.									
	with mitigation	1	2	2	1	5	Low	-	Medium			
Impact 1: Deterioration of	without mitigation	3	3	2	4	32	Medium	-	High			
water quality	degree to which impact can be reversed:	Reversing the ir (e.g. Bioremedia significantly red	npacts will be re ation etc.) imme uced. These me	elatively difficult ediately followin easures are how	t however if a og a spill the ever a very o	appropriate me degree and ex costly exercise	easures are car tent of the imp	ried out acts can be	High			
	degree of impact on irreplaceable resources:	The significance probability of fu altered state of	of the impacts rther water qua these wetlands	can be kept low lity deterioratio	v if mitigatior n at Wetland	n measures are s 1 and 2 are	e strictly enforce lower due to th	ed. The e already	Medium			
	Nature of impact:	The removal of thereby increase	vegetation will i ing the erosion	result in an incr potential.	ease in smoo	th surfaces in	creasing the po	tential veloci	ty of surface run-off			
	with mitigation	1	2	2	1	5	Low	-	Medium			
Impact 2:	without mitigation	3	3	2	3	24	Low	-	High			
Vegetation removal	degree to which impact can be reversed:	The impact can	only be fully rev	versed once the	vegetation i	s entirely re-e	stablished.		High			
	degree of impact on irreplaceable resources:	If vegetation cle following constr significance	earing is kept to ruction activities	a minimum and the severity of	d replanting of the impacts	of vegetation i can be conside	s carried out di erably reduced	rectly to a low	High			
Impact 3:	Nature of impact:	Increased run-o	off may contribu	te to the spread	l of pollutant	s, exacerbate	erosion potentia	al and lead to	sedimentation.			
Increased	with mitigation	1	1	2	2	8	Low	-	Medium			
surface run-off	without mitigation	3	3	2	4	32	Medium	-	Medium			

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signif	icance	Status	Confidence				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D	D+M)*P)	(+ve or - ve)	Confidence				
	degree to which impact can be reversed:	The probability appropriate and (refer to EMPr). surface run-off	of impacts resul adequate mitig Due to the pow can lead to incre	ting from surfac ation measures er line crossing eased sedimenta	e run-off car in order to n several weth ation within t	h be avoided by nanage run-off and systems, tl hese systems.	implementing and to reduce he mismanage	its velocity ment of	High				
	degree of impact on irreplaceable resources:	The degree of the first the extent of the first the second	e degree of the impacts will be relatively low if appropriate mitigation measures are enforced an the extent of the impact is limited to the site and its immediate surroundings.										
BIODIVERSITY													
	Nature of impact:	Adverse Impact	verse Impact due to loss or degradation of natural habitat										
	with mitigation	1	4	2	3	21	Low	-	high				
Impact 1: Loss	without mitigation	2	5	2	4	36	Medium	-	high				
of natural/ pristine habitat	degree to which impact can be reversed:	None			high								
	degree of impact on irreplaceable resources:	Low							high				
	Nature of impact:	Adverse Impact	due to faunal ir	nteractions with	structures, p	personnel, activ	vities						
Impact 2: Direct	with mitigation	1	2	2	3	15	Low	-	high				
impacts on	without mitigation	2	3	4	3	27	Low	-	high				
interactions with structures and personnel	degree to which impact can be reversed:	High							high				
	degree of impact on irreplaceable resources:	Moderate	oderate										
AVIFAUNA													
Impact 1: Disturbance of	Nature of impact:	Noise and move	loise and movement, from staff and machinery, may disturb avifauna, and nests may be disturbed.										
avifauna	with mitigation	1	1	5	3	21	Low	-	Medium				

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ificance	Status	0 - a fi d - a - a -			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	-D+M)*P)	(+ve or - ve)	Confidence			
	without mitigation	2	1	7	4	40	Medium	-	Medium			
	degree to which impact can be Partially reversible reversed:											
	degree of impact on irreplaceable resources:	Low	_OW									
	Nature of impact:	Permanent remo	rmanent removal of habitat that is used, or may be used, by avifauna.									
	with mitigation	1	2	4	4	28	Low	-	Medium			
Impact 2:	without mitigation	1	2	7	5	50	Medium	-	Medium			
Habitat destruction	degree to which impact can be reversed:	Partially reversil	ble									
	degree of impact on irreplaceable resources:	Low										
HERITAGE												
Due to the fact the	at there are no heritag	ge sites or resour	ces along the p	roposed alterna	tive (Corridoi	r 3), no herita	ige impacts are	foreseen.				
VISUAL												
Impact 1: Potential visual	Nature of impact:	Visual impact du	ue to vegetatior	n clearing, earth	works, heavy	vehicles, du	st & rehabilitatio	on fail	-			
impact of	with mitigation	4	1	4	2	18	Low	-	High			
sensitive visual	without mitigation	4	1	4	3	27	Low	-	High			
users of roads and residents of	degree to which impact can be reversed:	Recoverable							-			
settlements) in close proximity to the power lines	degree of impact on irreplaceable resources:	None							-			

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
	Nature of impact:	Visual impact du	ue to vegetation	clearing, earth	works, heavy	v vehicles, dus	t & rehabilitatio	n failure.				
	with mitigation	3	1	2	1	6	Low	-	High			
Impact 2:	without mitigation	3	1	2	2	12	Low	-	High			
Potential visual impact of construction on	degree to which impact can be reversed:	Recoverable							-			
sensitive visual receptors (i.e. users of roads	degree of impact on irreplaceable resources:	None										
and residents of	with mitigation	1	5	4	3	30	Low		Medium			
settlements)	without mitigation	1	5	6	4	48	Medium		Medium			
region	degree to which impact can be reversed:	Moderate		Medium								
	degree of impact on irreplaceable resources:	Not Applicable							Medium			
			P	ower Line - Co	orridor 4							
GEOLOGY												
Impact 1:	Nature of impact:	Spillages and le a minimum by a	aks from fuels,	oil and other po housekeeping a	tentially haz	ardous substar	nces during han d implementing	dling, use an the relevant	d storage can be kept to mitigation measures.			
Pollution of geological	with mitigation	1	1	2	2	8	Low	Neutral	High			
features in case	without mitigation	3	4	6	3	39	Medium	-	High			
leakage of hydrocarbon and other	degree to which impact can be reversed:	Low							Medium			
hazardous material	degree of impact on irreplaceable resources:	Low							High			
AGRICULTURAL	POTENTIAL											

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	0 C dan se			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
	Nature of impact:	Construction act redistributed	tivities will requ	ire that the top	soil is strippe	ed and stored,	which may res	ult in some to	op soil being lost or			
	with mitigation	1	4	2	2	14	Low	-	High			
Impact 1: Loss	without mitigation	1	5	6	4	48	Medium	-	High			
or redistribution of top soil degree to which impact can be reversed: Medium									High			
	degree of impact on irreplaceable resources:	High	jh									
GROUND WATER	Ł											
	Nature of impact:	It is possible that sort are spilled of	It is possible that construction of the power lines could lead to local deterioration in groundwater quality if pollutants of any sort are spilled or introduced into the holes needed for the pylons during construction.									
Impact 1	with mitigation	2	2	2	1	6	Low	-	medium			
Possible deterioration in	without mitigation	2	4	4	1	10	Low	-	medium			
local groundwater guality	degree to which impact can be reversed:	Once pollutants necessitating re risk can be almo	are introduced -excavation, etc ost completely a	into the ground c. If appropriate voided.	, reversing th precautions	ne impact wou are taken how	ld be fairly diffine vever, it is likely	cult - / that the				
	degree of impact on irreplaceable resources:	The groundwate sense that alter	er resource alon native sources o	g the power line of water could b	e route is not e found if ne	considered to eded.	be irreplaceabl	e, in the				
SURFACE WATE	R											
Impact 1:	Nature of impact:	The construction possibility of wa construction ma Wetland 6 which	n of power lines ter contamination chinery and equin has a PES of ".	 witch cross th on by hydrocart upment during A". 	rough Wetla oons (oil and the construct	nd 1 and 2 and diesel etc.), s tion phase. The	d runs alongsid olvents and oth e biggest conce	e Wetlands 4 er pollutants rn is the pote	and 6 creating the spilling/leaking from ential contamination of			
Deterioration of	with mitigation	2	2	2	2	12	Low	-	Medium			
water quality	without mitigation	3	3	6	4	48	Medium	-	High			
	degree to which impact can be reversed:	Reversing the impacts will be relatively difficult however if appropriate measures are carried out (e.g. Bioremediation etc.) immediately following a spill the degree and extent of the impacts can be significantly reduced. These measures are however a very costly exercise										

Potential	Potential Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence		
Impact	migation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	connuence		
	degree of impact on irreplaceable resources:	The significance probability of fu altered state of to Wetland 6.	of the impacts rther water qua these wetlands.	can be kept low lity deterioratio . A point of cond	v if mitigatior n at Wetland cern however	n measures are s 1 and 2 are r is the close p	e strictly enforce lower due to the roximity of the	ed. The e already power line	Medium		
	Nature of impact:	The removal of thereby increase	vegetation will ing the erosion	result in an incr potential.	ease in smoo	th surfaces ind	creasing the pot	tential velocit	cy of surface run-off		
	with mitigation	2	2	2	2	10	Low	-	Medium		
Impact 2: Vegetation	without mitigation	3	3	6	4	48	Medium	-	High		
removal	degree to which impact can be reversed:	The impact can	mpact can only be fully reversed once the vegetation is entirely re-established.								
	degree of impact on irreplaceable resources:	If vegetation clearing is kept to a minimum and replanting of vegetation is carried out directly following construction activities the severity of the impacts can be considerably reduced to a low High significance									
	Nature of impact:	Increased run-o	ff may contribu	te to the spread	l of pollutant	s, exacerbate	erosion potentia	al and lead to	sedimentation.		
	with mitigation	2	1	2	2	10	Low	-	Medium		
Impact 3:	without mitigation	3	3	4	4	40	Medium	-	Medium		
surface run-off	degree to which impact can be reversed:	The probability appropriate and (refer to EMPr). surface run-off	of impacts resul adequate mitig Due to the pow can lead to incre	ting from surfaction measures ver line crossing eased sediment	ce run-off car in order to r several wetl ation within t	n be avoided b nanage run-of and systems, t hese systems.	by implementing if and to reduce the mismanage) its velocity ment	High		
	degree of impact on irreplaceable resources:	The degree of the first the degree of the first the extent of the first the	ne impacts will l the impact is lin	be relatively low nited to the site	if appropria and its imm	te mitigation n ediate surroun	neasures are er Idings.	forced and	Medium		
BIODIVERSITY											
Impact 1: Loss	Nature of impact:	Adverse Impact	due to loss or o	legradation of r	natural habita	t					
or degradation of natural/	with mitigation	1	4	4	4	36	Medium	-	high		
pristine habitat	without mitigation	2	5	4	5	55	Medium	-	high		

Potential Mitigation		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence
	degree to which impact can be reversed:	None							high
	degree of impact on irreplaceable resources:	Low							high
	Nature of impact:	Adverse Impact	due to faunal in	es					
Impact 2: Direct	with mitigation	1	2	4	3	21	Low	-	high
impacts on	without mitigation	2	3	6	3	33	Medium	-	high
interactions with structures and	degree to which impact can be reversed:	High			high				
	degree of impact on irreplaceable resources:	Moderate							high
AVIFAUNA									
	Nature of impact:	Noise and move	ement, from stat	ff and machiner	y, may distu	rb avifauna, aı	nd nests may be	e disturbed.	
	with mitigation	1	1	4	3	18	Low	-	Medium
Impact 1:	without mitigation	2	1	6	4	36	Medium	-	Medium
Disturbance of avifauna	degree to which impact can be reversed:	Partially reversi	ble						
degree of impact on irreplaceable Low									
Impact 2:	Nature of impact:	Permanent rem	oval of habitat t	hat is used, or i	may be used	, by avifauna.			
Habitat	with mitigation	1	2	4	4	28	Low	-	Medium
destruction	without mitigation	1	2	6	5	45	Medium	-	Medium

_		Extent	Duration	Magnitude	Probabili	Signi	ficance	Status					
Potential Impact	Mitigation	(E)	(D)	(M)	ty (P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence				
	degree to which impact can be reversed:	Partially reversi	rtially reversible										
	degree of impact on irreplaceable resources:												
HERITAGE													
Due to the fact the	at there are no herita	ge sites or resour	ites or resources along the proposed alternative (corridor 4), no heritage impacts are foreseen.										
VISUAL													
Impact 1: Potential visual	Nature of impact:	Visual impact du	ual impact due to vegetation clearing, earthworks, heavy vehicles, dust & rehabilitation failure.										
impact of	with mitigation	4	1	4	2	18	Low	-	High				
sensitive visual	without mitigation	4	1	4	3	27	Low	-	High				
users of roads and residents of	degree to which impact can be reversed:	Recoverable	ecoverable										
settlements) in close proximity to the power line	degree of impact on irreplaceable resources:	None											
Impact 2: Potential visual	Nature of impact:	Visual impact du	ue to vegetation	clearing, earth	works, heavy	v vehicles, dus	t & rehabilitatio	n failure.					
impact of	with mitigation	3	1	2	1	6	Low	-	High				
sensitive visual	without mitigation	3	1	2	2	12	Low	-	High				
receptors (i.e. users of roads and residents of reversed:													
settlements) within the region	degree of impact on irreplaceable resources:	None											
SOCIAL													

Potential	Mitiantina	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
	Nature of impact:	Continued disru	ption of the exis	sting land uses								
	with mitigation	1	5	4	3	30	Low	-	Medium			
Impact 1: Disruption of	without mitigation	1	5	6	4	48	Medium	-	Medium			
land use and loss of economic potential	degree to which impact can be reversed:	Moderate Medium										
	degree of impact on irreplaceable resources:	Not Applicable							Medium			
Power Line - No-Go Alternative												
GEOLOGY	GEOLOGY											
In the event that	the powerlines are no	t relocated, there	will be no impa	act on the under	lying geology	, therefore th	e status quo wi	ll remain.				
AGRICULTURAL	POTENTIAL											
In the event that remain.	the powerlines are no	t relocated, there	e will be no impa	act on the existin	ng agricultura	al potential of	the land in que	stion, therefo	re the status quo will			
GROUND WATER	2											
If the power line r	oute is not changed, t	there is likely to l	pe no change to	existing ground	lwater condit	ions, and no p	otential impact					
SURFACE WATER	R											
If the power line r	oute is not changed, t	there is likely to l	pe no change to	existing surface	e water condi	itions, and no	potential impac	t.				
BIODIVERSITY												
In the case of no	changes to the existin	g powerline route	e, no additional	impacts are ant	icipated and	the status quo	o will remain					
AVIFAUNA												
If the power line r	oute is not changed, t	there is likely to l	pe no change to	existing conditi	ons, and no	potential impa	ct on the avifau	una is anticipa	ated			
HERITAGE												
In the event that	the power line is not r	noved, the status	s quo shall rema	in.								
VISUAL	VISUAL											
In the event that	the power line is not r	noved, the status	s quo shall rema	in.								
SOCIAL												
	0.24											

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		
In the event that	n the event that the power line is not moved, the status quo shall remain.									

Potential		Extent	Duration	Magnitude	Probabili tv	Signif	ficance	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
				Pipeline Rou	ıte 1							
GEOLOGY												
Impact 1:	Nature of impact:	Spillages and le a minimum by a	aks from fuels, applying a good	oil and other po housekeeping a	tentially haza pproach and	ardous substar observing and	nces during han d implementing	dling, use an the relevant	d storage can be kept to mitigation measures.			
Pollution of	pollution of with mitigation 1 1 2 2 8 Low Neutral											
features in case	without mitigation	3	4	6	3	39	Medium	-	High			
leakage of hydrocarbon and other	degree to which impact can be reversed:	Low	Medium									
hazardous material	degree of impact on irreplaceable resources:	Low	w High									
AGRICULTURAL	POTENTIAL											
	Nature of impact:	Construction ac redistributed	tivities will requ	ire that the top	soil is strippe	ed and stored,	which may resu	ult in some to	op soil being lost or			
	with mitigation	1	4	2	2	14	Low	-	High			
Impact 1: Loss	without mitigation	1	5	6	4	48	Medium	-	High			
or redistribution of top soil	degree to which impact can be reversed:	Medium							High			
	degree of impact on irreplaceable resources:	High							High			
GROUND WATER	1											
Impact 1: Possible deterioration in	Nature of impact:	It is possible that construction of the pipeline could lead to local deterioration in groundwater quality if pollutants of any sor are introduced into the trench needed for the pipeline (i.e. the trench is used to bury waste of some kind), or if fuels or solvents are spilled during pipeline construction.										
local	with mitigation	2	2	2	1	6	Low	-	medium			
groundwater	without	2	4	4	1	10	Low	-	medium			

Table 9.3: Detailed assessment of identified impact for the Construction Phase – Water supply Pipelines

Hendrina Wet Ash Disposal Facility EIA: Final EIA Report Chapter 9: Impact Assessment EIA Ref Number: 12/12/20/2175 NES Ref Number: DEA/EIA/0000390/2011 July 2015

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
quality	mitigation											
	degree to which impact can be reversed:	Once pollutants excavation of th can be almost c	are put into tre le trench, etc. If ompletely avoid	nch, reversing t f appropriate pro led.	the impact we ecautions are	ould be fairly o taken howev	difficult - necess er, it is likely th	sitating re- at the risk				
	degree of impact on irreplaceable resources:	The groundwate sense that alter	er resource alon native sources o	g the pipeline ro of water could b	oute is not co e found if ne	onsidered to be eded.	e irreplaceable,	in the				
SURFACE WATE	R											
	Nature of impact:	Hydrocarbons (during the cons 6, which has an	rocarbons (oil and diesel etc.), solvents and other pollutants spilling/leaking from construction ming the construction phase may have an impact on the receiving aquatic environments. Especially which has an "A" PES category and to a less extent Wetland 4 (PES = C).									
	with mitigation	1	1	2	1	4	Low	-	High			
Impact 1: Deterioration of	without mitigation	2	2	4	3	24	Low	-	Medium			
water quality	degree to which impact can be reversed:	Reversing the ir (e.g. Bioremedia significantly red	npacts will be re ation etc.) imme uced. These me	elatively difficult ediately followin easures are how	t however if a g a spill the ever a very o	appropriate me degree and ex costly exercise	easures are carr tent of the impa	ried out acts can be	High			
	degree of impact on irreplaceable resources:	The degree of the mitigation meas	ne impact will be sures in place th	e directly relate e probability of	d to the exte this impact o	ent of the spill can be reduced	etc. With appro d drastically.	priate	Medium			
	Nature of impact:	The removal of thereby increasi	vegetation will r	result in an incre potential.	ease in smoo	oth surfaces ind	creasing the pot	tential veloci	cy of surface run-off			
	with mitigation	1	2	2	1	5	Low	-	Medium			
Impact 2: Vegetation	without mitigation	3	3	6	3	36	Medium	-	High			
removal	degree to which impact can be reversed:	The impact can	only be fully rev	versed once the	vegetation i	s entirely re-e	stablished.		High			
	degree of impact on irreplaceable resources:	If vegetation cle following constr significance.	regetation clearing is kept to a minimum and replanting of vegetation is initiated directly owing construction activities the severity of the impacts can be considerably reduced to a low High nificance.									
Impact 3: Increased	Nature of impact:	Increased run-o	creased run-off may contribute to the spread of pollutants, exacerbate erosion potential and lead to sedimentation.									
surface run-off	with mitigation	2	2	2	2	12	Low	-	Medium			

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)	connuence
	without mitigation	3	3	6	4	48	Medium	-	Medium
	degree to which impact can be reversed:	The probability appropriate and	of impacts resul adequate mitig	ting from surfac ation measures	ce run-off car in order to r	n be avoided b nanage run-of	y implementing f and to reduce	its velocity	Medium
	degree of impact on irreplaceable resources:	The degree of the impacts is limited	ne impacts will t ed to the pipelin	pe relatively low e servitude.	if they are r	nitigated quick	kly and if the ex	tent of the	Medium
BIODIVERSITY									
	Nature of impact: Adverse Impact due to the loss or degradation of natural habitat								
Impact 1: Loss or degradation of natural/ pristine habitat	with mitigation	1	3	2	3	18	Low	-	high
	without mitigation	2	4	2	4	32	Medium	-	high
	degree to which impact can be reversed:	Moderate		high					
	degree of impact on irreplaceable resources:	Low		high					
	Nature of impact:	Adverse Impact							
Impact 2: Direct	with mitigation	1	2	2	3	15	Low	-	high
impacts on	without mitigation	2	3	4	4	36	Medium	-	high
interactions with structures and personnel	degree to which impact can be reversed:	High							high
personner	degree of impact on irreplaceable resources:	Moderate							high
Impact 3: Loss,	Nature of impact:	Adverse Impact	due to disruption	on of ecological	connectivity				
ecological	with mitigation	1	3	2	3	18	Low	-	high
connectivity	without	2	4	2	4	32	Medium	-	high
				9-28					

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
Impact	Mitgation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Comucilie			
	mitigation											
	degree to which impact can be reversed:	Moderate							high			
	degree of impact on irreplaceable resources:	Low	w									
	Nature of impact:	Adverse Impact	lverse Impact resulting from the loss/ degradation of surrounding natural habitat									
	with mitigation	1	3	2	3	18	Low	-	high			
Impact 4: Loss/ Degradation of surrounding habitat, species	without mitigation	2	5	2	5	45	Medium	-	high			
	degree to which impact can be reversed:	Moderate		high								
	degree of impact on irreplaceable resources:	Low		high								
AVIFAUNA												
	Nature of impact:	Noise and move										
	with mitigation	2	1	2	3	15	Low	-	Medium			
Impact 1:	without mitigation	2	1	4	4	28	Low	-	Medium			
Disturbance of avifauna	degree to which impact can be reversed:	Partially reversil	Partially reversible									
	degree of impact on irreplaceable resources:	Low										
Impact 2:	Nature of impact:	Permanent remo	oval of habitat t	hat is used, or	may be used,	, by avifauna.						
Habitat	with mitigation	1	3	2	5	30	Low	-	Medium			
destruction	without mitigation	1	3	2	5	30	Low	-	Medium			
				9-29								

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence				
Impact	Mitgation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	connuence				
	degree to which impact can be reversed:												
	degree of impact on irreplaceable Low resources:												
HERITAGE													
Due to the fact th	at there are no herita	ge sites or resour	ces along the p	roposed alterna	tive, no herit	age impacts a	re foreseen.						
VISUAL													
<i>Impact 1:</i> Potential visual	Nature of impact:	Visual impact du	sual impact due to vegetation clearing, earthworks, heavy vehicles, dust & rehabilitation failure.										
impact of construction on sensitive visual receptors (i.e. users of roads and residents of	with mitigation	4	1	4	2	18	Low	-	High				
	without mitigation	4	1	4	3	27	Low	-	High				
	degree to which impact can be reversed:	Recoverable		-									
settlements) in close proximity to the pipeline	degree of impact on irreplaceable resources:	None		-									
Impact 2: Potential visual	Nature of impact:	Visual impact du	ue to vegetatior	n clearing, earth	works, heavy	y vehicles, dus	t & rehabilitatio	on failure.					
impact of	with mitigation	3	1	2	1	6	Low	-	High				
construction on sensitive visual	without mitigation	3	1	2	2	12	Low	-	High				
receptors (i.e. users of roads and residents of homesteads and settlements) within the region	degree to which impact can be reversed:	Recoverable							-				
	degree of impact on irreplaceable resources:	None							-				
SOCIAL													
Impact 1:	Nature of	Continued disru	ption of the exis	sting land uses									

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
Disruption of	impact:											
land use and	with mitigation	1	5	4	3	30	Low	-	Medium			
potential	without mitigation	1	5	6	4	48	Medium	-	Medium			
	degree to which impact can be reversed:	Moderate	oderate Medium									
	degree of impact on irreplaceable resources:	Not Applicable	ot Applicable Medium									
Pipeline - No-Go Alternative												
GEOLOGY												
In the event that the pipeline is not relocated, there will be no impact on the underlying geology, therefore the status guo will remain.												
AGRICULTURAL POTENTIAL												
In the event that remain.	the pipeline is not relo	ocated, there will	be no impact or	n the existing ag	gricultural po	tential of the l	and in question	, therefore th	e status quo will			
GROUND WATER	ł											
If the pipeline rou	te is not changed, the	ere is likely to be	no change to ex	isting groundwa	ater conditior	ns, and no pote	ential impact.					
SURFACE WATE	R											
If the pipeline rou	te is not changed, the	ere is likely to be i	no change to ex	isting surface w	ater conditio	ons, and no pot	tential impact.					
BIODIVERSITY												
In the event that	the pipeline is not relo	ocated, there will	be no additiona	l impact on the	biodiversity,	therefore the	status quo will	remain.				
AVIFAUNA												
If the pipeline rou	te is not changed, the	ere is likely to be i	no change to ex	isting condition	s, and no pot	tential impact	on the avifauna	i is anticipate	d			
HERITAGE												
In the event that	the pipeline is not mo	ved, the status qu	uo shall remain.									
VISUAL												
In the event that	the pipeline is not mo	ved, the status qu	uo shall remain.									
SOCIAL												

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Significance	Status	Confidence
Impact		(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	conndence	
In the event that	the pipeline is not mo	ved, the status qu	uo shall remain.					

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Communice		
			Wet a	sh disposal fao	cility – Site	E					
GEOLOGY	GEOLOGY										
Impact 1:	Nature of impact:	Spillages and le a minimum by 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.								
Pollution of	with mitigation	1	1	2	2	8	Low	Neutral	High		
features in case	without mitigation	3	4	6	3	39	Medium	-	High		
leakage of hydrocarbon and other	degree to which impact can be reversed:	Low		Medium							
hazardous material	degree of impact on irreplaceable resources:	Low		High							
AGRICULTURAL POTENTIAL											
	Nature of impact:	The transport and handling of contaminants during operation could be a risk. The primary source of contamination includes fuels, ash sludge and oils.									
	with mitigation	1	1	2	4	8	Low	-	High		
Imnact 1: Soil	without mitigation	3	4	6	3	39	Medium	-	High		
Pollution	degree to which impact can be reversed:	High	High								
	degree of impact on irreplaceable resources:	Medium							High		
GROUND WATER	2										
Impact 1: Deterioration of groundwater quality due to	Nature of impact:	Rainwater percolating through ash together with slurry or supernatant water will migrate downwards towards the water table. The HDPE liner should prevent this leachate from reaching the water table but some penetration might occur. (likely to raise the pH and raise the TDS value, amongst other impacts). This impact will increase with time, as more leachate migrates downwards.									
ash leachate	with mitigation	1	1	2	4	8	Low	-	high		

Table 9.4: Detailed assessment of identified impacts for the Operational Phase – Wet ash disposal facility

Hendrina Wet Ash Disposal Facility EIA: Final EIA Report Chapter 9: Impact Assessment EIA Ref Number: 12/12/20/2175 NES Ref Number: DEA/EIA/0000390/2011 July 2015

Potential	Mitirotion	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
	without mitigation	2	3	6	4	44	Medium	-	high			
	degree to which impact can be reversed:	It will be difficul to reduce the ar systems work a slowly reverse t	It to reverse this mount of leacha s designed. Whe he impact.	s impact during te as much as p en deposition ce	wet ash disp oossible by er ases, natura	osal facility op nsuring that th l attenuation c	eration. It is m e under-drain a over many years	ore feasible and related s is likely to	high			
	degree of impact on irreplaceable resources:	Since the impac degree of impac	ance the impact is likely to be on local groundwater only, and this resource can be replaced, the egree of impact is likely to be low medium									
Impact 2: Rise	Nature of impact:	The local water percolating dow rise) will depend in the area, the	The local water table is likely to rise beneath the wet ash disposal facility, and in the near vicinity, due to the water percolating downwards from the ash slurry. The exact volume of this water (and hence the rate and magnitude of water table rise) will depend on factors including the efficiency of the underdrain system the liner, the volumes of slurry pumped, rainfall n the area, the aquifer properties underlying the site, etc.									
in local water	with mitigation	2	4	2	3	24	Low	-	medium			
table due to additional	without mitigation	2	4	2	4	32	Medium	-	medium			
recharge caused by slurry deposition	degree to which impact can be reversed:	The main mitigates system. This system stops, it is likely	enstock deposition al levels.	medium								
	degree of impact on irreplaceable resources:	This impact is th		medium								
	Nature of impact:	It is possible that This may affect disposal facility	at the groundwa some local sprii site is already s	ater flow direction ngs and seeps (situated near to	ons will be all both in terms a local water	tered locally du s of volume an r divide, this in	ue to the rise or id quality). How npact is deemed	r "mounding" vever, since t d to be relativ	of the local water table. he proposed wet ash vely minor.			
Impact 3:	with mitigation	2	4	2	3	24	Low	-	medium			
Change in local groundwater	without mitigation	2	4	2	3	24	Low	-	medium			
flow directions due to rise in local water table	degree to which impact can be reversed:	This impact is o their pre-deposi	nly practically re ition state.	eversible once d	leposition cea	ases and wate	r table conditior	ns return to	medium			
	degree of impact on irreplaceable resources:	This impact is th	nought to be lov	۷.					medium			
SURFACE WATE	R											

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	0 m fi damaa			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or - ve)	Confidence			
	Nature of impact:	The wet ash dis lower considera catchment will b placement of th	he wet ash disposal facility may result in lowered base flows which may cause the water level in the downstream dam to ower considerably due to the loss of the catchment area to the ash dam. A large percentage of the upstream dam's atchment will be sterilised due to the significant proportion of the immediate catchment that will be affected by the lacement of the proposed ash facility.									
Impact 1: Loss	with mitigation	3	4	4	3	33	Medium	-	Medium			
of water resources downstream	without mitigation	3	5	6	5	70	High	-	Medium			
	degree to which impact can be reversed:	It will be almost will be lost once	It will be almost impossible to reverse the impact as the run-off that is accumulated at alternative E will be lost once construction activities commence.									
	degree of impact on irreplaceable resources:	The degree of th area will be lost that the dam wi	The degree of the impact is believed to be medium as a large proportion of the dam's catchment area will be lost during the construction of the wet ash disposal facility. However, is should be noted that the dam will still receive run-off from its catchment to the east and west.									
	Nature of impact:	If the leachate f impact on the w	nage system) it could have a severe								
	with mitigation	2	2	4	2	16	Low	-	High			
Impact 2:	without mitigation	4	4	6	4	56	Medium	-	High			
Deterioration of water quality	degree to which impact can be reversed:	It would be extr that the design leachate throug during the const	Medium									
	degree of impact on irreplaceable resources:	Implementation and the ash wat	of adequate mi er return syster	tigation measur n will keep the	es and regul significance o	ar maintenanc of potential im	e of the drainag	ge network	High			
	Nature of impact:	If storm water r surrounding env	un-off is not ad vironment	equately manag	jed it could re	esults in the tr	ansport of harm	nful/toxic sub	ostances into the			
Turner of Dr. Channer	with mitigation	1	4	4	2	18	Low	-	Medium			
water run-off	without mitigation	4	4	6	4	56	Medium	-	Medium			
ash disposal facility.	degree to which impact can be reversed:	The degree of the place throughout	ne impacts can l It the operationa	be reversed if a al phase of the	dequate stor wet ash dispo	m water mana osal facility.	gement system	is kept in	Medium			
	degree of impact on irreplaceable	The significance is put into place	of impacts can . Storm water r	be kept relative un-off will beco	ely low if ade me more of a	quate storm w an issue over t	ater manageme ime as the leng	ent system th of the	Medium			

Potential	Mitiantina	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	0 Cidanaa			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
	resources:	slope increases	after years of s	urry deposition	•			-				
	Nature of impact:	Natural run-off of the catchmer	atural run-off patterns will be altered as storm water run-off will be diverted around the wet ash disposal facility and the lost the catchment area to the wet ash disposal facility.									
	with mitigation	2	4	4	3	30	Low	-	Medium			
Impact 4: Changes in	without mitigation	3	5	8	4	64	High	-	High			
natural surface water flow patterns	degree to which impact can be reversed:	This impact can impacts can be	his impact cannot be reversed once the wet ash disposal facility is constructed, however the mpacts can be mitigated to reduce the significance of the impacts.									
	degree of impact on irreplaceable resources:	The impact can the design of a already in an im	The impact can be minimised by implementation of appropriate mitigation measures and through the design of a storm water management system. It is important to note that the catchment is already in an impacted state due to the construction of several dams.									
BIODIVERSITY												
	Nature of impact:	Adverse Impact	Adverse Impact resulting from faunal interactions with structures, activities, personnel									
Impact 1 · Direct	with mitigation	1	5	2	2	16	Low	-	High			
impacts on	without mitigation	1	5	6	3	36	Medium	-	High			
& interactions with structures	degree to which impact can be reversed:	Moderate	Moderate									
	degree of impact on irreplaceable resources:	Low							high			
	Nature of impact:	Adverse Impact	s resulting from	the loss/ degra	dation of sur	rounding habi	tat					
Impact 2: Loss/	with mitigation	1	4	2	2	14	Low	-	high			
Degradation of surrounding	without mitigation	2	5	4	4	44	Medium	-	high			
habitat, species	degree to which impact can be reversed:	High							high			
Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
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Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	conndence			
	degree of impact on irreplaceable resources:	Moderate							high			
AVIFAUNA												
	Nature of impact:	Leachate contain used by water b	ning heavy met irds.	als from the AD	F (if not prop	erly contained	l) could result in	n contaminat	ion of water sources,			
	with mitigation	2	4	4	2	20	Low	-	Low			
Impact 1:	without mitigation	2	4	6	3	36	Medium	-	Low			
of surrounding water	degree to which impact can be reversed:	Reversible										
	degree of impact on irreplaceable resources:	Low										
VISUAL												
Impact 1: Potential visual	Nature of impact:	Visual impact du lighting structur	ue to the wet as es)	h disposal facili	ty and on-sit	e ancillary infr	astructure (con	veyors, acce	ss roads, fencing,			
impact on	with mitigation	4	4	8	3	48	Medium	-	High			
receptors (i.e.	without mitigation	4	4	8	3	48	Medium	-	High			
and residents of homesteads and	degree to which impact can be reversed:	Recoverable							-			
close proximity to the proposed wet ash disposal facility	degree of impact on irreplaceable resources:	None							-			
Impact 2: Potential visual	Nature of impact:	Visual impact du lighting structur	ie to the wet as es)	h disposal facili	ty and on-sit	e ancillary infr	astructure (con	veyors, acces	ss roads, fencing,			
impact on	with mitigation	3	4	6	2	26	Low	-	High			
sensitive visual receptors (i.e.	without mitigation	3	4	6	2	26	Low	-	High			

Potential	Mitiantica	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
users of roads and residents of homesteads and	degree to which impact can be reversed:	Recoverable							-			
settlements) within the region	degree of impact on irreplaceable resources:	None							-			
	Nature of impact:	Visual impact du lighting structur	ue to the wet as es)	h disposal facilit	ty and on-sit	e ancillary infr	astructure (con	veyors, acce	ss roads, fencing,			
Impact 3:	with mitigation	3	4	4	1	11	Low	-	High			
Potential visual impact on	without mitigation	3	4	4	1	11	Low	-	High			
commuters traveling by rail within the	degree to which impact can be reversed:	Recoverable	ecoverable									
region	degree of impact on irreplaceable resources:	None	lone									
<i>Impact 4:</i> Potential visual	Nature of impact:	Visual impact at										
impact of	with mitigation	4	4	4	2	24	Low	-	High			
lighting at night on sensitive	without mitigation	4	4	4	3	36	Medium	-	High			
visual receptors in close proximity to the	degree to which impact can be reversed:	Recoverable							-			
proposed wet ash disposal facility	degree of impact on irreplaceable resources:	None							-			
Impact 5: Potential visual	Nature of impact:	Visual impact at	night due to sk	y glow								
impact of	with mitigation	3	4	2	1	9	Low	-	High			
on sensitive	without mitigation	3	4	2	2	18	Low	-	High			
within the region	degree to which impact can be	Recoverable							-			

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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)		
	reversed:									
	degree of impact on irreplaceable resources:	None							-	
Impact 6:	Nature of impact:	Visual impact du lighting structur	ue to the wet as es)	h disposal facili	ty and on-sit	e ancillary infr	astructure (con	veyors, acces	ss roads, fencing,	
Potential visual impact of the	with mitigation	3	4	2	2	18	Low	-	High	
proposed wet	without mitigation	3	4	2	2	18	Low	-	High	
facility on visual character of the landscape and	on visual degree to which impact can be reversed:									
sense of place of the region	degree of impact on irreplaceable resources:	None					-			
Import 7	Nature of	Visual impact du	ie to the wet as	h disposal facili	ty and on-sit	e ancillary infr	astructure (con	veyors, acces	ss roads, fencing,	
Potential visual	with mitigation	3	4	2	2	18	Low	-	High	
impact of the proposed wet	without mitigation	3	4	2	2	18	Low	-	High	
ash disposal facility on tourist access	degree to which impact can be reversed:	Recoverable							-	
routes within the region	degree of impact on irreplaceable resources:	None							-	
SOCIAL										
Impact 1: Continued	Nature of impact:	A positive impac	t through the c	ontinued provis	ion of electric	city to the reg	ion and the nation	onal grid		
generation of	with mitigation	4	5	6	5	75	High	+	Medium	
electricity for the national grid	without mitigation	4	5	6	5	75	High	+	Medium	

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 to which impact can be reversed:	Not Applicable							Medium		
	degree of impact on irreplaceable resources:	High – through resources such	the continued so as coal.	upply of electric	ity more use	will be made	of non-renewab	le	Medium		
	Nature of impact:	The new Wet as	h disposal facili	ty will potentiall	y result in in	creased PM10	concentrations	in the local a	area		
	with mitigation	1	4	4	3	27	Low	-	Medium		
<i>Impact 2:</i> 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 t	he implementat		Medium						
	degree of impact on irreplaceable resources:	Not applicable	oplicable								
	Nature of impact:	The new Wet as	h disposal facili	ty will potentiall	y result in in	creased dust f	all rates in the	local area			
	with mitigation	1	4	4	3	27	Low	-	Medium		
Impact 3: Nuisance from	without mitigation	2	4	6	4	48	Medium	-	Medium		
elevated dustfall rates	degree to which impact can be reversed:	Moderate with t	he implementat	ion of the releva	ant mitigatio	n measures			Medium		
	degree of impact on irreplaceable resources:	Not applicable							Medium		
			Wet ash dis	posal facility -	No-Go Alte	rnative					
GROUND WATER	2										
Impact 1: No	Nature of impact:	If the wet ash d underlying the r	isposal facility is proposed site, b	s not built, then oth in terms of	it is likely th quality and q	hat there will b proundwater qu	e no change to Jality.	the groundw	ater conditions		
groundwater	with mitigation	2	4	4	4	40	Medium	+	medium		
conditions at the	without	2	4	4	4	40	Medium	+	medium		
				9-40			•		·		

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Potential		Extent	Duration	Magnitude	Probabili tv	Signi	ficance	Status	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence
site	mitigation								
	degree to which impact can be reversed:	This positive im activity affected	pact (i.e. not bu I the groundwat	ome future	medium				
	degree of impact on irreplaceable resources:The groundwater resource at the proposed site is not considered to be irreplaceable, in the sense that alternative sources of water can be found if needed.								
SURFACE WATE	CE WATER								
If the Wet ash dis	posal facility is not co	nstructed or oper	ated, there will	be no change to	o existing sur	face water co	nditions, and he	ence no poter	ntial impacts.
BIODIVERSITY									
If the wet ash dis are anticipated	posal facility is not cor	nstructed or oper	ated, there is lik	ely to be no cha	ange to exist	ing conditions	, and therefore	no additional	impacts on biodiversity
AVIFAUNA									
If the wet ash dis anticipated	posal facility is not cor	nstructed or oper	ated, there is lik	ely to be no cha	ange to exist	ing conditions	, and therefore	no potential	impact on the avifauna is
VISUAL									
If the wet ash dis anticipated	posal facility is not cor	nstructed or oper	ated, there is lik	ely to be no cha	ange to exist	ing conditions	, and therefore	no potential	visual impacts are
SOCIAL									
If the wet ash dis anticipated	posal facility is not cor	nstructed or oper	ated, there is lik	ely to be no cha	ange to exist	ing conditions	, and therefore	no potential	visual impacts are

Potential		Extent	Duration	Magnitude	Probabili ty	li Significance		Status		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence	
			I	Power Line Co	rridor 3			<u> </u>		
GEOLOGY										
Impact 1:	Nature of impact:	Spillages and le a minimum by a	aks from fuels, applying a good	oil and other po housekeeping a	tentially haza pproach and	ardous substar observing and	nces during han I implementing	dling, use an the relevant	d storage can be kept to mitigation measures.	
Pollution of	with mitigation	1	1	2	2	8	Low	Neutral	High	
features in case	without mitigation	3	4	6	3	39	Medium	-	High	
leakage of hydrocarbon and other	degree to which impact can be reversed:	Low							Medium	
hazardous material	degree of impact on irreplaceable resources:	Low							High	
GROUND WATER	ξ									
No impacts on the	e local Ground water a	are anticipated								
SURFACE WATE	R									
There are no perc	eived impacts on surf	ace water during	the operation of	f the relocated p	ower lines					
BIODIVERSITY										
	Nature of impact:	Adverse Impact	resulting from	the loss or degra	adation of na	atural habitat				
	with mitigation	1	2	2	2	10	Low	-	Moderate	
Impact 1: Loss	without mitigation	2	3	4	3	27	Low	-	Moderate	
of natural/ pristine habitat	degree to which impact can be reversed:	High							Moderate	
	degree of impact on irreplaceable resources:	Low							Moderate	
Impact 2: Loss/ Degradation of	Nature of impact:	f Adverse Impact resulting from the degradation of surrounding habitat (maintenance operations)								
				9-42						

Table 9.5: Detailed assessment of identified impacts for the Operational Phase – PowerLines

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
surrounding	with mitigation	1	2	2	2	10	Low	-	Moderate
naditat, species	without mitigation	2	3	4	3	27	Low	-	Moderate
	degree to which impact can be reversed:	High							Moderate
	degree of impact on irreplaceable resources:	Low							Moderate
AVIFAUNA									
	Nature of impact:	Bird perches on live and earthed	pylon and caus components, r	gap between	live components and/or				
	with mitigation	1	4	2	1	7	Low	-	High
Impact 1:	without mitigation	2	-	High					
Electrocution	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	medium							
	Nature of impact:	Collision of birds	s with the overh	iead line (usuall	y the earth v	vire).			
	with mitigation	2	4	2	3	24	Low	-	High
Impact 2:	without mitigation	2	4	4	5	50	Medium	-	High
Collisions	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	medium							
Impact 3:	Nature of impact:	Routine mainter	nance of pylons	and power lines	s could result	in disturbance	e of certain bird	species	
Disturbance	with mitigation	1	2	4	2	14	Low		medium
				9-43					

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Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	0			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
	without mitigation	2	2	4	3	24	Low		medium			
	degree to which impact can be reversed:	High										
	degree of impact on irreplaceable resources:	Low										
VISUAL												
Impact 1: Potential visual	Nature of impact:	Visual impact du	ue to the power	line, access roa	d and servitu	ıde	_	_	-			
impact on	with mitigation	4	5	6	2	30	Low	-	High			
sensitive visual receptors (i.e. users of roads and residents of homesteads and	without mitigation	4	5 6 2 30 Low - Hi									
	degree to which impact can be reversed:	Recoverable	Recoverable									
close proximity to the proposed power line	degree of impact on irreplaceable resources:	None	None -									
<i>Impact 2:</i> Potential visual	Nature of impact:	Visual impact du	ue to the power	line, access roa	d and servitu	ıde						
impact on	with mitigation	3	5	4	1	12	Low	-	High			
sensitive visual receptors (i.e.	without mitigation	3	5	4	1	12	Low	-	High			
users of roads and residents of homesteads and	degree to which impact can be reversed:	Recoverable							-			
settlements) within the region	degree of impact on irreplaceable resources:	None							-			
SOCIAL												
Impact 1: Health risk to	Nature of impact:	The health risk	to residents from	m EMF will rema	in the same,	as there are a	already existing	powerlines.				

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
residents from	with mitigation	1	5	2	2	16	Low	-	Medium			
EMF	without mitigation	1	5	4	3	30	Low	-	Medium			
	degree to which impact can be reversed:	High – ensure t	hat residences a	ire the required	distance awa	ay from the se	rvitude		Medium			
degree of impact on irreplaceable resources:									Medium			
			PowerLine - Corridor 4									
GEOLOGY												
Impact 1:	Nature of impact:	Spillages and le a minimum by a	pillages and leaks from fuels, oil and other potentially hazardous substances during handling, us minimum by applying a good housekeeping approach and observing and implementing the relevance.									
Pollution of	with mitigation	1	1	2	2	8	Low	Neutral	High			
features in case	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							High			
GROUND WATE	R											
No impacts on the	e local ground water a	re anticipated										
SURFACE WATE	R											
There are no perc	eived impacts on surfa	ace water during	the operation of	f the relocated p	ower lines							
BIODIVERSITY												
Impact 1: Loss	Nature of impact:	Adverse Impact	resulting from	the loss of natu	al habitat (n	naintenance o	perations)					
or degradation	with mitigation	1	2	4	3	21	Low	-	Moderate			
pristine habitat	without mitigation	2	3	6	3	33	Medium	-	Moderate			

Potential		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 to which impact can be reversed:	High							Moderate		
	degree of impact on irreplaceable resources:	Low							Moderate		
	Nature of impact:	Adverse Impact	s resulting from	degradation of	surrounding	habitat during	g maintenance c	perations	_		
	with mitigation	1	3	4	3	24	Low	-	Moderate		
Impact 2: Loss/	without mitigation	2	4	6	3	36	Medium	-	Moderate		
surrounding habitat, species	degree to which impact can be reversed:	High	gh								
	degree of impact on irreplaceable resources:	Low									
AVIFAUNA											
	Nature of impact:	Bird perches on live and earthed	pylon and caus I components, r	es an electrical esulting in deat	short circuit h or severe i	by physically t njury.	oridging the air	gap between	live components and/or		
	with mitigation	1	4	2	1	7	Low	-	High		
Impact 1:	without mitigation	2	4	4	2	20	Low	-	High		
Electrocution	degree to which impact can be reversed:	Low									
	degree of impact on irreplaceable resources:	medium									
	Nature of impact:	Collision of birds	s with the overh	iead line (usuall	y the earth v	vire).					
Impact 2: Collisions	with mitigation	1	4	2	4	28	Low	-	High		
Compions	without mitigation	2	4	4	5	50	Medium	-	High		

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
Impact	Hitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	connuence			
	degree to which impact can be reversed:	Low										
	degree of impact on irreplaceable resources:	medium										
	Nature of impact:	Routine mainter	nance of pylons	and power lines	could result	in disturbance	e of certain bird	species				
	with mitigation	1	2	4	2	14	Low		medium			
Impact 3:	without mitigation	2	2	4	3	24	Low		medium			
Disturbance	degree to which impact can be reversed:	High	h									
	degree of impact on irreplaceable Low											
VISUAL												
Potential visual	Nature of impact:			Visual impact of	due to the po	owerline, acces	ss road and serv	vitude				
sensitive visual	with	4	5	6	2	30	Low	-	High			
receptors (i.e.	without	4	5	6	2	30	Low	-	High			
users of roads and residents of homesteads and	degree to which impact can be reversed:			Re	coverable							
close proximity to the proposed power line	degree of impact on irreplaceable resources:				None							
Potential visual	Nature of impact:			Visual impact of	due to the po	owerline, acces	ss road and serv	vitude				
sensitive visual	with	3	5	4	1	12	Low	-	High			
receptors (i.e.	without	3	5	4	1	12	Low	-	High			

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Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence				
users of roads and residents of homesteads and	degree to which impact can be reversed:			Re	coverable								
settlements) within the region	degree of impact on irreplaceable resources:				None								
SOCIAL													
	Nature of impact:	Continued disru	ntinued disruption of the existing land uses										
	with mitigation	1	5	4	3	30	Low	-	Medium				
Impact 1: Disruption of	without mitigation	1	5 6 4 <mark>48 Medium</mark> -										
land use and loss of economic potential	degree to which impact can be reversed:	Moderate	derate										
	degree of impact on irreplaceable resources:	Not Applicable							Medium				
	Nature of impact:	Health risk to re	esidents from EN	<mark>4F will remain t</mark>	he same, as t	there are alrea	ady powerline						
	with mitigation	1	5	2	2	16	Low	-	Medium				
<i>Impact 2:</i> Health risk to	without mitigation	1	5	4	3	30	Low	-	Medium				
residents from EMF	degree to which impact can be reversed:	High – ensure tl	hat residences a	are the required	distance awa	ay from the se	ervitude		Medium				
	degree of impact on irreplaceable resources:	Not applicable							Medium				
			Powe	erLine - No-Go	Alternative)							
GROUND WATER	2												
No adverse impac	lo adverse impacts on the local groundwater conditions are anticipated												
				9-48									

Potential		Extent	Duration	Magnitude	Probabili ty	Significance	Status	Confidence		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or - ve)	Confidence		
SURFACE WATE	R									
There are no perceived impacts on surface water during the operation of the relocated power lines										
BIODIVERSITY										
If the power line i	s not moved, there is	likely to be no ch	ange to existing	g conditions, an	d therefore no	o additional impacts on biod	iversity are antio	cipated		
AVIFAUNA										
If the power line r	route is not changed, I	there is likely to l	pe no change to	existing condition	ions, and no p	otential impact on the avifa	una is anticipate	ed		
VISUAL										
In the event that the power line is not moved, the status quo shall remain.										
SOCIAL										
In the event that the power line is not moved, the status quo shall remain.										

	Table 9.6: Detailed	assessment of	identified in	npacts for t	the Operational	Phase – Pipeline
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Potential		Extent	Duration	Magnitude	Probabili tv	Signi	ficance	Status				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
			Pip	eline Route (p	referred)							
GEOLOGY												
Impact 1:	Nature of impact:	Spillages and lea minimum by app	aks from fuels, plying a good he	oil and other po ousekeeping ap	tentially haza proach and o	ardous substai bserving and i	nces during mai mplementing th	ntenance op ie relevant m	erations can be kept to a nitigation measures.			
Pollution of	with mitigation	1	1	2	2	8	Low	Neutral	High			
features in case	without mitigation	3	4	6	3	39	Medium	Negative	High			
leakage of hydrocarbon and other	degree to which impact can be reversed:	Low	_OW									
hazardous material degree of impact on irreplaceable resources: Low									High			
GROUND WATER												
Due to the fact that the pipeline is a water pipeline, no impacts on the local Ground water are anticipated												
SURFACE WATER	R											
There are no perce	eived impacts on surfa	ace water during	the operation of	f the relocated p	oipeline							
BIODIVERSITY												
	Nature of impact:	Adverse Impact	s resulting from	faunal interacti	ions with stru	ictures, persoi	nnel, activities					
Impact 1 · Direct	with mitigation	2	2	2	2	12	Low	-	High			
impacts on common fauna	without mitigation	3	4	4	3	33	Medium	-	High			
& interactions with structures & personnel	degree to which impact can be reversed:	High							High			
	degree of impact on irreplaceable resources:	Moderate							High			
<i>Impact 2:</i> Loss or disruption of	Nature of impact:	Adverse Impact	due to the loss,	/ disruption of e	cological con	inectivity						
				9-50								

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
Potential Impact w ecological connectivity w mddein w definition w Impact 3: Loss/ Degradation of surrounding habitat, species W Main w Impact 1: Disruption of land use and loss of economic potential Nain GROUND WATER Main	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
ecological	with mitigation	2	1	2	2	10	Low	-	High			
connectivity	without mitigation	3	4	4	4	44	Medium	-	High			
	degree to which impact can be reversed:	High							High			
	degree of impact on irreplaceable resources:	Moderate							High			
	Nature of impact:	Adverse Impact	/erse Impacts resulting from degradation of surrounding natural habitat									
	with mitigation	2	1	2	2	10	Low	-	High			
Impact 3: Loss/ Degradation of surrounding habitat,species	without mitigation	3	High									
	degree to which impact can be reversed:	High		High								
	degree of impact on irreplaceable resources:	Moderate		High								
SOCIAL												
	Nature of impact:	Continued disru	ption of the exis	sting land uses								
	with mitigation	1	5	4	3	30	Low		Medium			
Impact 1: Disruption of	without mitigation	1	5	6	4	48	Medium		Medium			
land use and loss of economic potential	degree to which impact can be reversed:	Moderate							Medium			
	degree of impact on irreplaceable resources:	Not Applicable		Medium								
			Pipe	eline - No-Go /	Iternative							
GROUND WATER	2											
				0.51								

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Potential	ntial Mitigation Extent Duration Magnitude Probabili Significant		Significance	Status	Confidence				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or - ve)	Comidence	
If the pipeline route is not changed, there is likely to be no change to existing groundwater conditions, and no potential impact.									
SURFACE WATE	R								
If the pipeline rou	ite is not changed, the	ere is likely to be	no change to ex	isting surface w	ater conditio	ns, and no potential impact.			
BIODIVERSITY									
If the pipeline route is not changed, there is likely to be no additional impacts on the biodiversity component									

Probabili Duration Magnitude Significance Extent Status Potential ty Mitigation Confidence (+ve or -Impact **(E)** (D) (M) (P) (S=(E+D+M)*P)ve) Wet ash disposal facility – Site E **GROUND WATER** Nature of Leachate from the wet ash disposal facility is likely to continue to percolate downwards even when slurry disposal has ceased, albeit at a much lower rate. The liner will mitigate this impact considerably. impact: 2 3 2 3 21 with mitigation Low high Impact 1: without 4 2 4 3 30 hiah Low deterioration of mitigation groundwater dearee to which This impact can be significantly mitigated against, but cannot be entirely reversed. If the drainage quality due to impact can be system is kept functional, groundwater monitoring continues and the wet ash disposal facility is hiah leachate vegetated then downward drainage of leachate into the groundwater will be minimised. reversed: degree of impact The impact on local groundwater is thought to be low, and the local groundwater resource could be on irreplaceable medium replaced by other water resources if necessary. resources: Once decommissioned, the water table under the wet ash disposal facility should begin to decline again, since the volume of water migrating downwards will be lower. However, there is likely to be a small residual effect on water table, since the Nature of infiltration and recharge characteristics of the overlying rehabilitated wet ash disposal facility will not be the same as those of impact: the original landcover. This may lead to a slight rise in water table and potential local changes in groundwater flow direction. These effects are likely to be minor, and limited to the local area. Impact 2: Minor 2 4 0 3 with mitigation 18 Low medium changes to local without water table and 2 2 3 4 24 Low medium mitigation local The impact can be lessened by vegetating the wet ash disposal facility and preventing erosion etc, aroundwater degree to which which will reduce movement of water /leachate downwards once ash deposition has ceased. The full flow direction impact can be high impact would be difficult to reverse however, since this would most likely involve removing the reversed: rehabilitated wet ash disposal facility. degree of impact on irreplaceable Very minor impact anticipated medium resources: SURFACE WATER Nature of If the leachate from the wet ash disposal facility is not adequately managed (via the drainage system) it could have a severe Impact 1: Deterioration of impact: impact on the water quality of the receiving aquatic environment.

Table 9.7: Detailed assessment of identified impacts for the De-Commissioning Phase – Wet ash disposal facility

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence		
water quality	with mitigation	2	2	4	2	16	Low	-	High		
	without mitigation	3	3	8	4	56	Medium	-	High		
	degree to which impact can be reversed:	The degree of the mitigation mease impacts on the second s	ne impact can n sures still in plac surrounding env	ot entirely be re ce, especially the vironment can b	eversed, how e liner and th e avoided.	ever through r ne drainage ne	egular mainten twork system, i	ance of the negative	Medium		
	degree of impact on irreplaceable resources:	Keeping and ma will keep the sig	aintaining mitiga Inificance of pot	ation measures a cential impact lo	and regular r w.	maintenance of	f the drainage r	network etc.	High		
	Nature of impact:	If storm water r surrounding env	torm water run-off is not adequate manage it could results in the transport of harmful/toxic subst rounding environment.								
	with mitigation	1	4	4	2	18	Low	-	Medium		
<i>Impact 2:</i> Storm water run-off	without mitigation	4	Medium								
	degree to which impact can be reversed:	The degree of the place throughout	ı is kept in	Medium							
	reversed: prace throughout the operational phase of the wet ash disposal facility. degree of impact on irreplaceable resources: The significance of impacts can be kept relatively low if adequate storm water management system are kept in place beyond the operational phase and if vegetation is well established. Vegetation will provide stability and reduce the velocity of storm water run-off. Medium										
BIODIVERSITY		•									
	Nature of impact:	Adverse Impact	s resulting from	faunal interact	ions with act	ivities, personi	nel, structures		-		
Impact 1 · Direct	with mitigation	1	2	2	2	10	Low	-	high		
impacts on	without mitigation	1	3	4	3	24	Low	-	high		
interactions with structures and personnel	degree to which impact can be reversed:	High							high		
·	degree of impact on irreplaceable resources:	Moderate							high		
Impact 2: Loss/ Degradation of	Nature of impact:	Adverse Impact	s resulting from	degradation of	surrounding	habitat					
surrounding	with mitigation	2	2	2	2	12	Low	-	high		
				9-54							

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence		
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence		
habitat, species	without mitigation	2	2	2	2	12	Low	-	high		
	degree to which impact can be reversed:	High							high		
	degree of impact on irreplaceable resources:	Moderate							high		
VISUAL											
<i>Impact 1:</i> Potential visual	<i>npact 1:</i> Nature of Visual impact due to vegetation clearing, earthworks, dust & rehabilitation failure.										
impact of site	with mitigation	4	1	6	2	22	Low	-	High		
works on sensitive visual receptors (i.e. users of roads and residents of homesteads and	without mitigation	4	1	6	3	33	Medium	-	High		
	degree to which impact can be reversed:	Recoverable	Recoverable								
settlements) in close proximity to the proposed wet ash disposal facility	degree of impact on irreplaceable resources:	None	None								
<i>Impact 2:</i> Potential visual	Nature of impact:	Visual impact du	ue to vegetation	n clearing, earth	works, dust 8	& rehabilitatio	n failure.				
impact of site	with mitigation	3	1	4	1	8	Low	-	High		
works on sensitive visual	without mitigation	3	1	4	2	16	Low	-	High		
receptors (i.e. users of roads and residents of	degree to which impact can be reversed:	Recoverable							-		
settlements) within the region	degree of impact on irreplaceable resources:	None	None								
Impact 3:	Nature of	Visual impact du	ue to the rehabi	litated wet ash	disposal facili	ity and remov	al of superfluou	s ancillary in	frastructure.		

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence		
Impact		(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	ve)			
Potential visual	impact:										
impact of the rehabilitated	with mitigation	4	5	4	3	39	Medium	+	High		
wet ash disposal facility on	without mitigation	4	5	4	3	39	Medium	+	High		
sensitive visual receptors (i.e. users of roads	degree to which impact can be reversed:	N/A	Ά								
and residents of homesteads and settlements) in close proximity to the proposed wet ash disposal facility	degree of impact on irreplaceable resources:	None	None								
Impact 4: Potential visual	Nature of impact:	Visual impact due to the rehabilitated wet ash disposal facility and removal of superfluous ancillary infrastructure.									
impact of the	with mitigation	3	5	2	3	30	Low	+	High		
wet ash disposal	without mitigation	3	5	2	3	30	Low	+	High		
facility on sensitive visual receptors (i.e. users of roads and residents of homesteads and settlements) within the region	degree to which impact can be reversed:	N/A							-		
	degree of impact on irreplaceable resources:	None	None								

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		
			Р	owerLine – Co	orridor 3						
BIODIVERSITY											
	Nature of impact:	Adverse Impact on site. This imp	e vehicles and personnel								
Impact 1 · Direct	with mitigation	1	2	2	2	10	Low	-	high		
Potential ImpactBIODIVERSITYImpact 1: Direct impacts on common fauna & interactions with structures & personnelNation wit wit deg on res Nation 	without mitigation	2	3	2	3	21	Low	-	high		
	degree to which impact can be reversed:	None	None								
	degree of impact on irreplaceable resources:	Low	ow								
Nature of impact: Adverse Impact resulting from degradation of surrounding habitat (contamination, fires, etc)											
Potential ImpactMitigationBIODIVERSITYNature of impact: with mitigatio with out mitigation degree to which impact can be reversed: degree of impact on irreplaceab resources:Impact 2: Loss/ Degradation of surrounding habitat, speciesNature of impact can be reversed: degree of impact with mitigation 	with mitigation	1	high								
	without mitigation	2	high								
	degree to which impact can be reversed:	None	None								
	degree of impact on irreplaceable resources:	Low							high		
			P	ower Line – Co	orridor 4						
BIODIVERSITY											
Impact 1: Direct impacts on	Nature of impact:	Adverse Impact on site. This imp	resulting from bact is however	faunal interaction temporary and	ons with pers of low signifi	sonnel, activiti cance	ies e.g. the pre	sence of larg	e vehicles and personnel		
& interactions	with mitigation	1	2	4	2	14	Low	-	high		
with structures	without	2	3	4	3	27	Low	-	high		
				9-57							

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Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	0			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Conndence			
& personnel	mitigation											
	degree to which impact can be reversed:	None	None									
	degree of impact on irreplaceable resources:	Low	Low									
	Nature of impact:	Adverse Impact	etc)									
	with mitigation	1	2	4	2	14	Low	-	high			
Impact 2: Loss/ Degradation of	without mitigation	2	2 3 6 3 33 Medium -									
surrounding habitat,species	degree to which impact can be reversed:	None							high			
	degree of impact on irreplaceable resources:	Low		high								

Table 9.9: Detailed assessment of identified impacts for the De-Commissioning Phase – Pipeline

Potential Impact	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status (+ve or -	Confidence		
		(E)	(D)	(M)	(۳)	(S=(E+	D+M)*P)	ve)			
				Pipeline Ro	oute						
BIODIVERSITY											
	Nature of impact:	Adverse Impact on site. This imp	dverse Impact resulting from faunal interactions with personnel, activities e.g. the presence of large n site. This impact is however temporary and of low significance								
Impact 1: Direct	with mitigation	1	3	2	2	12	Low	-	high		
impacts on common fauna	without mitigation	2	4	2	3	24	Low	-	high		
& interactions with structures & personnel	degree to which impact can be reversed:	Moderate		high							
	degree of impact on irreplaceable resources:	Low	Low								
	Nature of impact:	Adverse Impact resulting from temporary disruption of ecological connectivity									
	with mitigation	1	2	2	2	10	Low	-	high		
Impact 2: Loss or disruption of	without mitigation	2	3	4	3	27	Low	-	high		
ecological connectivity	degree to which impact can be reversed:	High	High								
	degree of impact on irreplaceable resources:	Moderate							high		
Impact 3: Loss/	Nature of impact:	Adverse Impact	resulting from	degradation of s	surrounding h	nabitat (contai	mination, fires,	etc)			
Degradation of surrounding	with mitigation	1	3	2	2	12	Low	-	high		
habitat, species	without mitigation	2	4	2	4	32	Medium	-	high		

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Significance	Status	Confidence
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or - ve)	connuence
	degree to which impact can be reversed:	Moderate						high
	degree of impact on irreplaceable resources:	Low						high

Potential		Extent	Duration	Magnitude	Probabili ty	Signif	ficance	Status	0 G d				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence				
			Wet a	sh disposal fao	cility – Site	E							
GROUND WATER	t												
	Nature of impact:	The wet ash disp wet ash disposa decommissioned after ash slurry	oosal facility is l l facility operati l. This is becaus deposition has e	ikely to lead to on but which wi se leachate will ended. This imp	deterioration Il likely persi continue to b pact will be n	of local grour st in some for be generated fr nitigated by th	ndwater quality, m long after the rom the ash by e installation of	which will be wet ash dis natural rainfa the HDPE lir	e most severe during posal facility has been all percolation, even ner.				
Impact 1:	with mitigation	2	4	2	4	28	Low	-	medium				
Deterioration of groundwater	without mitigation	2	4	4	4	40	Medium	-	medium				
quality due to ash leachate	degree to which impact can be reversed:	The impact can ash disposal fac disposal facility	impact can be lessened but not reversed completely by maintaining good practices during wet disposal facility construction and operation, and by re-vegetating and maintaining the wet ash posal facility after closure.										
	degree of impact on irreplaceable resources:	The degree of in resources are lir	he degree of impact on irreplaceable resources is thought to be low, since local groundwater esources are limited and are theoretically replaceable with alternatives.										
Impact 2: Rise	Nature of impact:	There is a possa disposal facility vicinity of the si state after deco seepage rates, g	bilityof a residu decommissionin te. These impac mmissioning, bu geochemistry of	al rise in the wa g. This rise will ts are considere at the full exten- the ash residue	ater table und in turn lead ed to be relat t of rehabilita e, etc. The li	derlying the we to slightly alte tively minor. T ation will need ner system wil	et ash disposal red groundwate The system will to be determin I mitigate this i	facility, even or flow direct slowly move ed, and will o mpact furthe	long after wet ash ions in the immediate back towards its natural depend on long-term r.				
in local water	with mitigation	1	4	2	4	28	Low	-	medium				
table and minor changes to local	without mitigation	2	4	2	4	32	Medium	-	medium				
groundwater flow directions	degree to which impact can be reversed:	Unlikely that this vegetating and i	s impact can be maintaining the	reversed comp wet ash dispose	letely, but m al facility)	itigation can b	e carried out (e	e.g. by	medium				
	degree of impact on irreplaceable resources:	Minor							medium				
SURFACE WATER	R												
Impact 1: Loss of wetland function	Nature of impact:	The loss of asso including sedime alternative E wit	ciated wetland f ent; and to a sn h still provide t	unctions which nall extent flood hese functions.	include: Nut attenuation	rient removal and stream flo	(particularly Nit ow augmentatic	rates); trapp on as the dan	ing of pollutants n located to the north of				

Table 9.10: Detailed assessment of identified cumulative impacts – Wet ash disposal facility

Potential		Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence		
	with mitigation	3	3	6	4	48	Medium	-	Medium		
	without mitigation	4	4	8	5	80	High	-	High		
	degree to which impact can be reversed:	The degree of the surrounding cat occurred in asso	e degree of the impact will not be easily reversed due to the severely impacted nature of the rrounding catchments. Several large dam have been constructed and severe canalisation has curred in associated wetlands due to the altered state of the catchment.								
	degree of impact on irreplaceable resources:	The degree of ir	e degree of impact on irreplaceable resources is thought to be medium.								
	Nature of impact:	Impacts associa Hendrina Power	pacts associated with surrounding industrial and agricultural activates (input of nutrients and hea Indrina Power Station and existing wet ash disposal facility								
	with mitigation	4	3	6	4	52	Medium	-	Medium		
Impact 2:	without mitigation	5	4	8	5	85	High	-	High		
water quality	degree to which impact can be reversed:	It is not likely the water quality as enrichment (age	nat the cumulat sociated with th ricultural activiti	ive impacts can ne catchment. V es and WWTW)	be easily rev Vater quality and the inpu	verse due to th in the catchmo it of salts from	ne altered natur ent is impacted n industrial activ	e of the by nutrient vities.	Medium		
	degree of impact on irreplaceable resources:	The degree of in state of the aqu	npact on irrepla atic ecosystems	ceable resource located within	es is thought the catchme	to be medium nt.	due to the alre	ady altered	Medium		
Impact 3:	Nature of impact:	The altered wat the catchment h result of the sec	he altered water quality (increased turbidity) and substrate composition of the receiving aquatic enviro ne catchment has resulted in altered marginal habitats due to excessive reed growth and alien vegetati esult of the sediment deposition.								
Erosion and	with mitigation	2	2	4	3	24	Low	-	Medium		
sedimentation	without mitigation	3	4	8	4	60	Medium	-	Medium		
	degree to which impact can be reversed:	Once sedimenta precautions are	4 8 4 90 Medium - ice sedimentation has occurred, reversion of the impact would be difficult, however if appropriate ecautions are put into place it is likely that the risk can be almost completely avoided. -								

Potential	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
Impact	Mitgation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	connuence			
	degree of impact on irreplaceable resources:	The contributior catchment can t construction act	of the wet ash be minimal in ac ivities commend	disposal facility dequate erosion ce, and through	to the cumu control mea out the lifesp	llative impacts sures are put oan of the wet	associated wit into place befor ash disposal fa	h the e cility.	High			
BIODIVERSITY												
	Nature of impact:	Adverse Impact	lverse Impacts resulting from loss of important ecological types									
	with mitigation	1	5 2 5 40 Medium -									
Impact 1: Impacts on SA's	without mitigation	2	5	6	5	65	High	-	high			
conservation obligations & targets	degree to which impact can be reversed:	High	jh									
	degree of impact on irreplaceable resources:	Moderate	oderate									
	Nature of impact:	Adverse Impact	due to continue	ed loss of ecolog	gical connecti	vity						
Impact 2.	with mitigation	1	5	2	5	40	Medium	-	high			
Increase in local and regional	without mitigation	2	5	6	5	65	High	-	high			
fragmentation/ isolation of habitat	degree to which impact can be reversed:	High							high			
	degree of impact on irreplaceable resources:	Moderate	oderate									
VISUAL												
Impact 1: Potential visual	Nature of impact:	Cumulative visu	nfrastructure									
impact on	with mitigation	4	5	6	3	45	Medium	-	High			
sensitive visual receptors (i.e.	without mitigation	4	5	6	3	45	Medium	-	High			

Potential		Extent	Duration	Magnitude	Probabili ty	Signif	icance	Status	
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence
users of roads and residents of homesteads and	degree to which impact can be reversed:	Irrecoverable	-						-
settlements) in close proximity to the proposed wet ash disposal facility	degree of impact on irreplaceable resources:	None							-
Impact 2: Potential visual	Nature of impact:	Cumulative visu	al impact result	ing from the ac	cumulation o	f mining and ir	ndustrial type ir	nfrastructure	
impact on	with mitigation	3	5	4	2	24	Low	-	High
sensitive visual receptors (i.e.	without mitigation	3	5	4	2	24	Low	-	High
users of roads and residents of homesteads and	degree to which impact can be reversed:	Irrecoverable							-
settlements) within the region	degree of impact on irreplaceable resources:	None							-

Potential		Extent	Duration	Magnitude	Probabili ty	Signif	ficance	Status	O and D and D				
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence				
			P	ower Line – Co	orridor 3								
GROUND WATER	1												
	Nature of impact:	It is possible that sort are spilled of	at construction of or introduced in	of the power line to the holes nee	es could lead eded for the p	to local deteri oylons during o	oration in groui construction.	ndwater qual	ity if pollutants of any				
Impact 1:	with mitigation	2	2	2	1	6	Low	-	medium				
Possible deterioration in	without mitigation	2	4	-	medium								
local groundwater quality	degree to which impact can be reversed:	Once pollutants necessitating re risk can be almo	pollutants are introduced into the ground, reversing the impact would be fairly difficult - sitating re-excavation, etc. If appropriate precautions are taken however, it is likely that the an be almost completely avoided.										
	degree of impact on irreplaceable resources:	The groundwate sense that alter	groundwater resource along the power line route is not considered to be irreplaceable, in the medium se that alternative sources of water could be found if needed.										
SURFACE WATER	ł												
	Nature of impact:	The constructior possibility water construction ma	n of Power line - contamination chinery and equ	alternatives wl by hydrocarbor upment during	nich cross thr ns (oil and die the construct	rough Wetland esel etc.), solv ion phase	1 and 2 and ru ents and other	ins alongside pollutants sp	Wetlands 4 creating the illing/leaking from				
	with mitigation	2	2	2	1	6	Low	-	Medium				
Impact 1:	without mitigation	4	3	4	4	44	Medium	-	High				
Deterioration of water quality	degree to which impact can be reversed:	Reversing the in (Bioremediation significantly red	npacts will be re etc.) immediat uced. These me	elatively difficult ely following a s asures are how	however if a spill the degree ever a very c	appropriate me ee and extent costly exercise	easures are carr of the impacts o	ried out can be	High				
	degree of impact on irreplaceable resources:	The significance probability of fu altered state of makes Alternation	he significance of the impacts can be kept low if mitigation measures are strictly enforced. The robability of further water quality deterioration at Wetlands 1 and 2 are lower due to the already Itered state of these wetlands. Alternative 1 will however not run over Wetland 6 which therefore nakes Alternative 1 the preferred choice due to the relatively un-altered state of Wetland 6.										
Impact 2: Vegetation	Nature of impact:	The removal of vegetation will result in an increase in smooth surfaces thereby increasing the erosion potential and the potential velocity of surface run-off.											

Table 9.11: Detailed assessment of identified cumulative impacts – Power Lines

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		
removal											
	with mitigation	2	2	2	1	6	Low	-	Medium		
	without mitigation	4	3	4	3	33	Medium	-	High		
	degree to which impact can be reversed:	The impact can	he impact can only be fully reversed once the vegetation is entirely re-established.								
	degree of impact on irreplaceable resources:	If vegetation cle following constr significance	vegetation clearing is kept to a minimum and replanting of vegetation is carried out directly llowing construction activities the severity of the impacts can be considerably reduced to a low gnificance								
<i>Impact 3:</i> Increased surface run-off	Nature of impact:	Increased run-o	creased run-off may contribute to the spread of pollutants, exacerbate erosion potential and lead to se								
	with mitigation	2	2 2 2 2 12 Low -								
	without mitigation	4	3	4	4	44	Medium	-	Medium		
	degree to which impact can be reversed:	The probability appropriate and (refer to section surface run-off	of impacts resul adequate mitig 6). Due to the can lead to incre	ting from surfac ation measures power line cros eased sedimenta	ce run-off car in order to n sing several ation within t	n be avoided b nanage run-of wetland syster hese systems.	y implementing f and to reduce ns, the misman	its velocity agement of	High		
	degree of impact on irreplaceable resources:	The degree of the first of the extent of the second	ne impacts will t the impact is lim	be relatively low nited to the site	if appropriat and its imme	te mitigation n ediate surroun	neasures are er dings.	forced and	Medium		
BIODIVERSITY	1	1									
Too and to	Nature of impact:	Adverse Impacts resulting from loss of sensitive ecological vegetation types									
Impact 1: Impacts on SA's	with mitigation	1	4	2	3	21	Low	-	high		
conservation obligations &	without mitigation	2	5	2	4	36	Medium	-	high		
targets	degree to which impact can be reversed:	None	e high								

Potential Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
Impact	Mitgation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	connuence		
	degree of impact on irreplaceable resources:	Low							high		
VISUAL											
Impact 1: Potential visual impact on	Nature of impact:	Cumulative visu will be rerouted	Imulative visual impact resulting from the accumulation of electrical type infrastructure. These are Il be rerouted through the new preferred corridor.								
sensitive visual	with mitigation	4	5	4	2	26	Low	-	High		
receptors (i.e. users of roads	without mitigation	4	5	4	2	26	Low	-	High		
and residents of homesteads and settlements) in	degree to which impact can be reversed:	Recoverable							-		
close proximity to the proposed power line	degree of impact on irreplaceable resources:	None							-		
<i>Impact 2:</i> Potential visual	Nature of impact:	Cumulative visu will be rerouted	al impact result through the ne	ing from the ac w preferred cor	cumulation o ridor.	f electrical typ	e infrastructure	. These are	existing power lines that		
impact on	with mitigation	3	5	2	1	10	Low	-	High		
receptors (i.e.	without mitigation	3	5	2	1	10	Low	-	High		
and residents of homesteads and settlements)	degree to which impact can be reversed:	Recoverable							-		
within the region	degree of impact on irreplaceable resources:	None							-		
Power Line – Co	rridor 4										
GROUND WATER	Ł										
Impact 1: Possible deterioration in	Nature of impact:	It is possible that sort are spilled	at construction of or introduced in	of the power lin to the holes nee	es could lead eded for the p	to local deter oylons during	ioration in grou construction.	ndwater qual	ity if pollutants of any		
local	with mitigation	2	2	2	1	6	Low	-	medium		

Potential	Mitianting	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
groundwater quality	without mitigation	2	4	4	1	10	Low	-	medium			
	degree to which impact can be reversed:	Once pollutants necessitating re risk can be almo	are introduced -excavation, etc ost completely a	into the ground c. If appropriate voided.	, reversing the precautions	he impact wou are taken how	ld be fairly diffic vever, it is likely	cult - that the	medium			
	degree of impact on irreplaceable resources:	The groundwate sense that alter	er resource alon native sources o	g the power line of water could b	e route is not e found if ne	considered to eded.	be irreplaceabl	e, in the	medium			
SURFACE WATE	R											
	Nature of impact:	The construction creating the pos spilling/leaking potential contar	e construction of power line - alternatives which cross through Wetland 1 and 2 and runs alongside Wetlands 4 and 6 ating the possibility water contamination by hydrocarbons (oil and diesel ect.), solvents and other pollutants Iling/leaking from construction machinery and equipment during the construction phase. The biggest concern is the cential contamination of Wetland 6 which has a PES of "A".									
	with mitigation	2	2	2	2	12	Low	-	Medium			
Impact 1: Deterioration of	without mitigation	4	3	6	4	52	Medium	-	High			
water quality	degree to which impact can be reversed:	Reversing the ir (Bioremediation significantly red	npacts will be re etc.) immediat uced. These me	elatively difficult ely following a s asures are how	however if a spill the degreever a very o	appropriate me ee and extent costly exercise	easures are carr of the impacts o	ried out can be	High			
	degree of impact on irreplaceable resources:	The significance probability of fu altered state of to Wetland 6.	of the impacts rther water qua these wetlands.	can be kept low lity deterioratio A point of cond	if mitigatior n at Wetland cern however	n measures are s 1 and 2 are r is the close p	e strictly enforce lower due to the roximity of the	ed. The e already power line	Medium			
	Nature of impact:	The removal of thereby increas	The removal of vegetation will result in an increase in smooth surfaces increasing the potential velocity of surface run-off thereby increasing the erosion potential.									
Impact 2:	with mitigation	2	2	2	2	12	Low	-	Medium			
removal	without mitigation	4	3	4	4	44	Medium	-	High			
	degree to which impact can be reversed:	The impact can	The impact can only be fully reversed once the vegetation is entirely re-established.									

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:	If vegetation cle following constr significance	vegetation clearing is kept to a minimum and replanting of vegetation is carried out directly llowing construction activities the severity of the impacts can be considerably reduced to a low gnificance									
Impact 3: Increased surface run-off	Nature of impact:	Increased run-o	ff may contribu	te to the spread	l of pollutant	s, exacerbate	erosion potentia	al and lead to	sedimentation.			
	with mitigation	2	2	2	2	12	Low	-	Medium			
	without mitigation	4	3	6	4	52	Medium	-	Medium			
	degree to which impact can be reversed:	The probability appropriate and velocity. Due to off can lead to in	of impacts resul adequate mitig the power line ncreased sedim	ting from surfac lation measures crossing severa entation within	ce run-off can in order to r I wetland sys these system	n be avoided b manage run-of stems, the mis ns.	y implementing f and to reduce management si) its urface run-	High			
	degree of impact on irreplaceable resources:	The degree of the first of the	ne impacts will I the impacts is li	be relatively low mited to the site	if appropria e and its imm	te mitigation r nediate surrou	neasures are er ndings.	nforced and	Medium			
BIODIVERSITY												
	Nature of impact:	Adverse Impact	s resulting from	loss of sensitiv	e ecological	vegetation typ	es					
	with mitigation	1	4	4	3	27	Low	-	high			
<i>Impact 1:</i> Impacts on SA's	without mitigation	2	5	6	4	52	Medium	-	high			
conservation obligations & targets	degree to which impact can be reversed:	None							high			
	degree of impact on irreplaceable resources:	Low	Low									
VISUAL												
<i>Impact 1:</i> Potential visual impact on	Nature of impact:	Cumulative visu will be rerouted	al impact result through the ne	ing from the ac w preferred cor	cumulation o ridor.	f electrical typ	e infrastructure	e. These are e	existing power lines that			
sensitive visual	with mitigation	4	5	4	2	26	Low	-	High			
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Potential	Mitisotion	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence			
Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	Confidence			
receptors (i.e. users of roads	without mitigation	4	5	4	2	26	Low	-	High			
and residents of homesteads and settlements) in	degree to which impact can be reversed:	Recoverable							-			
close proximity to the proposed power line	degree of impact on irreplaceable resources:	None							-			
Impact 2: Potential visual	Nature of impact:	Cumulative visu will be rerouted	mulative visual impact resulting from the accumulation of electrical type infrastructure. These are existing power lines that I be rerouted through the new preferred corridor.									
impact on	with mitigation	3	5	2	1	10	Low	-	High			
receptors (i.e.	without mitigation	3	5	2	1	10	Low	-	High			
and residents of homesteads and settlements)	degree to which impact can be reversed:	Recoverable							-			
within the region	degree of impact on irreplaceable resources:	None							-			

Potential Impact	Mitigation	Extent	Duration	Magnitude	Probabili ty	Signi	ficance	Status	Confidence				
Impact	Mitgation	(E)	(D)	(M)	(P)	(S=(E+	D+M)*P)	(+ve or - ve)	connuence				
				Pipeline Cor	ridor								
GROUND WATER	2												
	Nature of impact:	It is possible that are introduced i solvents are spil	at construction on nto the trench r lled - especially	of the pipeline c needed for the p during pipeline	ould lead to pipeline (i.e. t construction	local deteriora he trench is u	tion in groundw sed to bury was	ater quality ste of some k	if pollutants of any sort kind), or if fuels or				
Impact 1:	with mitigation	2	2	2	1	6	Low	-	medium				
deterioration in	without mitigation	2	4	4	1	10	Low	-	medium				
groundwater quality	degree to which impact can be reversed:	Once pollutants fairly difficult - r however, it is lik	e pollutants are put into the trench - e.g. during construction - reversing the impact would be y difficult - necessitating re-excavation of the trench, etc. If appropriate precautions are taken rever, it is likely that the risk can be almost completely avoided.										
	degree of impact on irreplaceable resources:	The groundwate sense that alter	he groundwater resource along the pipeline route is not considered to be irreplaceable, in the ense that alternative sources of water could be found if needed.										
SURFACE WATE	R												
	Nature of impact:	Hydrocarbons (during the const 6, which has an	bil and diesel et truction phase r "A" PES catego	c.), solvents and nay have an im ry and to a less	d other pollut pact on the r extent Wetla	tants spilling/la eceiving aqual and 4 (PES = 0	eaking from cor tic environment C).	nstruction ma s. Especially	achinery and equipment with regards to Wetland				
	with mitigation	1	1	2	1	4	Low	-	High				
Impact 1: Deterioration of	without mitigation	2	2	4	3	24	Low	-	Medium				
water quality	degree to which impact can be reversed:	Reversing the in (Bioremediation significantly red	npacts will be re etc.) immediat uced. These me	elatively difficult ely following a s asures are how	t however if a spill the degree ever a very c	appropriate me ee and extent costly exercise	easures are carr of the impacts	ried out can be	High				
	degree of impact on irreplaceable resources:	The degree of the mitigation meas drastically.	ne impact will be sures in place (r	e directly relate efer to section 6	d to the exte 5) the probab	nt of the spill pility of this im	etc. With appro pact can be red	priate uced	Medium				
Impact 2: Vegetation removal	Nature of impact:	The removal of vegetation will result in an increase in smooth surfaces increasing the potential velocity of surface run-off thereby increasing the erosion potential											

Table 9.12: Detailed assessment of identified cumulative impacts – Pipeline

Potential Impact	Mitigation	Extent	Duration	Magnitude	Probabili ty	Significance (S=(E+D+M)*P)		Status	Confidence		
		(E)	(D)	(M)	(P)			(+ve or - ve)			
	with mitigation	1	2	2	1	5	Low	-	Medium		
	without mitigation	3	3	6	3	36	Medium	-	High		
	degree to which impact can be reversed:	The impact can only be fully reversed once the vegetation is entirely re-established.							High		
	degree of impact on irreplaceable resources:	If vegetation clearing is kept to a minimum and replanting of vegetation is carried out directly following construction activities the severity of the impacts can be considerably reduced to a Low significance							High		
Impact 3: Increased surface run-off	Nature of impact:	Increased run-off may contribute to the spread of pollutants, exacerbate erosion potential and lead to sedimentation									
	with mitigation	2	2	2	2	12	Low	-	Medium		
	without mitigation	3	3	6	4	48	Medium	-	Medium		
	degree to which impact can be reversed:	The probability of impacts resulting from surface run-off can be avoided by implementing appropriate and adequate mitigation measures in order to manage run-off and to reduce its velocity							Medium		
	degree of impact on irreplaceable resources:	The degree of the impacts will be relatively low if they are mitigated quickly and if the extents of the impacts are limited to the pipeline servitude.							Medium		
BIODIVERSITY											
Impact 1: Impacts on SA's conservation obligations & targets	Nature of impact:	Adverse Impacts resulting from loss of sensitive ecological vegetation types									
	with mitigation	1	5	2	3	24	Low	-	high		
	without mitigation	2	5	2	4	36	Medium	-	high		
	degree to which impact can be reversed:	Moderate							high		
Potential Impact	Mitigation	Extent	Duration	Magnitude	Probabili ty	Sig	Inificance	Status	Confidence		
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		(E)	(D)	(M)	(P)	(S=(E+D+M)*P)	(+ve or - ve)	connuence		
	degree of impact on irreplaceable resources:	Low						high			
	Nature of impact:	Adverse Impact	Adverse Impacts resulting from continued fragmentation of remaining natural habitat								
Impact 2:	with mitigation	1	5	2	3	24	Low	-	high		
Increase in local	without mitigation	2	5	2	4	36	Medium	-	high		
fragmentation/ isolation of habitat	degree to which impact can be reversed:	Moderate							high		
	degree of impact on irreplaceable resources:	Low							high		

The above impact analysis is summarised in **Table 9.13 – 9.24**.

Table 9.13: Summary of identified impacts for the Construction Phase – Wet ash disposal facility

	Significance				
Potential Impact	Wet ash dispo Site	osal facility – e E	Wet ash disposal facility – No-GO		
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	
GEOLOGY					
Impact 1: Construction-related earthworks	Medium	Low			
Impact 2: Pollution of geological features in case			N	Δ	
of spillage or leakage of hydrocarbon and other	Medium	Low	,	~	
hazardous material					
AGRICULTURAL POTENTIAL					
Impact 1: Loss of agricultural land	High	High	N	Ά	
Impact 2: Loss or redistribution of top soil	Medium	Low			
GROUNDWAIER					
Impact 1: Deterioration of groundwater quality	Medium	Low			
due to leachate from initial ash slurry					
Impact 2: Deterioration of groundwater quality	Low	Low	N/	Ά	
due to spillages during construction			_		
deposition	Low	Low			
NO CO Impact 1. No change to groundwater					
conditions at the site	N/	A	Low ⁺	Low ⁺	
Impact 1: Loss of wetland function	High	Low			
Impact 2: Deterioration of water quality	Medium	Low			
Impact 3: Increased surface run-off within the	Ficulari	LOW			
wet ash disposal facility	Medium	Low	N/A		
Impact 4: Frosion and Sedimentation	Medium	Low			
Impact 5: Altered hydrology	High	Low			
Impact 6: Loss of water resources downstream	High	Medium			
NO-GO - Impact 1: No change to groundwater					
conditions at the site	N/	A	Mealum	Mealum	
BIODIVERSITY					
Impact 1: Loss or degradation of natural/ pristine	Medium	Medium	N/	Ά	
habitat	Medium	Meuluin			
Impact 2: Direct impacts on common fauna &	Medium	low			
interactions with structures & personnel	Healam	1011			
Impact 3: Loss or disruption of ecological	Medium	Medium			
connectivity					
Impact 4: Loss/ Degradation of surrounding	Medium	low			
habitat, species					
AVIFAUNA					
Impact 1: Disturbance	Low	Low	N/	Ά	
Impact 2: Habitat destruction	Medium	Mealum	-		
HERITAGE					
footures	High	Medium	N/	Ά	
VISUAL					
Impact 1: Potential visual impact of construction					
on sensitive visual recentors (i.e. users of roads					
and residents of homesteads and settlements) in	Medium	Low			
close proximity to the proposed wet ash disposal	Ficulum	LOW			
facility			N	Ά	
Impact 2: Potential visual impact of construction			,		
on sensitive visual receptors (i.e. users of roads					
and residents of homesteads and settlements)	Low	Low			
within the region					
SOCIAL					

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<i>Impact 1:</i> Economic Development through employment	Low	Low	Medium	Low
Impact 2: Inflow of temporary workers	Low	Low		
<i>Impact 3:</i> Health Risk from elevated PM 10 Concentrations	Medium	Low	N/A	
Impact 4: Nuisance from elevated dustfall rates	Medium	Low		
<i>NO-GO - Impact 2:</i> Continued supply of electricity from Hendrina power station	N/A		High	N/A

Table 9.14: Summary of identified impacts for the Construction Phase – Power Lines

	Significance					
Potential Impact	Power Co	prridor 3	Power Corridor 4			
Potential impact	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation		
GEOLOGY	Theyation	intigation	Theyactor	inigation		
<i>Impact 1:</i> Pollution of geological features in case of spillage or leakage of hydrocarbon and other hazardous material	Medium	Low	Medium	Low		
AGRICULTURAL POTENTIAL						
Impact 1: Loss or redistribution of top soil	Medium	Low	Medium	Low		
GROUNDWATER						
Impact 1: Possible deterioration in local groundwater quality	low	low	Low	Low		
SURFACE WATER						
Impact 1: Deterioration of water quality	Medium	Low	Medium	Low		
Impact 2: Vegetation removal	Low	Low	Medium	Low		
Impact 3: Increased surface run-off	Medium	Low	Medium	Low		
BIODIVERSITY						
<i>Impact 1:</i> Loss or degradation of natural/ pristine habitat	Medium	Low	Medium	Medium		
<i>Impact 2:</i> Direct impacts on common fauna & interactions with structures & personnel	Low	low	Medium	Low		
AVIFAUNA						
Impact 1: Disturbance	Medium	Low	Medium	Low		
Impact 2: Habitat destruction	Medium	Low	Medium	Low		
VISUAL						
<i>Impact 1:</i> Potential visual impact of construction on sensitive visual receptors (i.e. users of roads and residents of homesteads and settlements) in close proximity to the power line	low	low	low	Low		
<i>Impact 2:</i> Potential visual impact of construction on sensitive visual receptors (i.e. users of roads and residents of homesteads and settlements) within the region	low	low	low	low		
SOCIAL						
Impact 1: Disruption of land use and loss of economic potential	Medium	Low	Medium	Low		

Table 9.15: Summary of identified impact for the Construction Phase – Pipelines

Potential Impact		Significance			
		Corridor (preferred)			
		Without Mitigation	With Mitigation		
GEOLOGY					
Impact 1: Pollution of geological features in case leakage of hydrocarbon and other hazardous mat	of spillage or cerial	Medium	Low		
AGRICULTURAL POTENTIAL					
Impact 1: Loss or redistribution of top soil		Medium	Low		
GROUNDWATER					
Impact 1: Possible deterioration in local groundw	ater quality	low	low		
SURFACE WATER					
Impact 1: Deterioration of water quality		Low	Low		

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Impact 2: Vegetation removal	Medium	low
Impact 3: Increased surface run-off	Medium	Low
BIODIVERSITY		
Impact 1: Loss or degradation of natural/ pristine habitat	Medium	Low
<i>Impact 2:</i> Direct impacts on common fauna & interactions with structures & personnel	Medium	low
Impact 3: Loss, or disruption of ecological connectivity	Medium	Low
Impact 4: Loss/ Degradation of surrounding habitat, species	Medium	Low
AVIFAUNA		
Impact 1: Disturbance	low	Low
Impact 2: Habitat destruction	low	low
VISUAL		
<i>Impact 1:</i> Potential visual impact of construction on sensitive visual receptors (i.e. users of roads and residents of homesteads and settlements) in close proximity to the power line	low	low
<i>Impact 2:</i> Potential visual impact of construction on sensitive visual receptors (i.e. users of roads and residents of homesteads and settlements) within the region	low	low
SOCIAL		
Impact 1: Disruption of land use and loss of economic potential	Medium	Low

	Significance				
Potential Impact	Wet ash dispo	osal facility –	Wet ash	disposal No-CO	
Potential impact	Without		Without	With	
	Mitigation	Mitigation	Mitigation	Mitigation	
GEOLOGY	Philipacion	milgation	migation	Piligation	
Impact 2: Pollution of geological features in case					
of spillage or leakage of hydrocarbon and other	Medium	Low	N/	/A	
hazardous material			-		
AGRICULTURAL POTENTIAL					
Impact 1: Soil Pollution	Medium	Low	N,	/A	
GROUNDWATER					
Impact 1: Deterioration of groundwater quality	Madium	Low			
due to ash leachate	Mealum	LOW			
Impact 2: Rise in local water table due to	Madium	Low		/ A	
additional recharge caused by slurry deposition	Mealum	LOW	N/	/ A	
Impact 3: Change in local groundwater flow	Low	Low			
directions due to rise in local water table	LOW	LOW			
NO-GO - Impact 1: No change to groundwater	N /	^ ^	Modiumt	Modiumt	
conditions at the site	N/	A	Medium	Meulum	
SURFACE WATER					
Impact 1: Loss of water resources downstream	High	Medium			
Impact 2: Deterioration of water quality	Medium	Low			
Impact 3: Storm water run-off within the wet ash	Medium	Low	N	/ •	
disposal facility facility.	Medium	LOW		A	
Impact 4: Changes in natural surface water flow	High	Low			
patterns	ingn	LOW			
BIODIVERSITY					
Impact 1: Direct impacts on common fauna &	Medium	low			
interactions with structures & personnel	Medium	1011	N	/Δ	
Impact 2: Loss/ Degradation of surrounding	Medium	low	14/		
habitat, species	Ficulum	1011			
AVIFAUNA					
Impact 1: Contamination of surrounding water	Medium	Low	<u> </u>	/A	
VISUAL					
Impact 1: Potential visual impact on sensitive					
visual receptors (i.e. users of roads and residents	Medium	Medium	N,	/A	
of homesteads and settlements) in close					

proximity to the proposed wet ash disposal facility		
<i>Impact 2:</i> Potential visual impact on sensitive visual receptors (i.e. users of roads and residents of homesteads and settlements) within the region	Low	Low
<i>Impact 3:</i> Potential visual impact on commuters traveling by rail in close proximity to the proposed wet ash disposal facility	Low	Low
<i>Impact 4:</i> Potential visual impact of lighting at night on sensitive visual receptors in close proximity to the proposed wet ash disposal facility	Medium	Low
<i>Impact 5:</i> Potential visual impact of lighting at night on sensitive visual receptors within the region	Low	Low
<i>Impact 6:</i> Potential visual impact of the proposed wet ash disposal facility on visual character of the landscape and sense of place of the region	Low	Low
<i>Impact 7:</i> Potential visual impact of the proposed wet ash disposal facility on tourist access routes within the region	Low	Low
SOCIAL		
Impact 1: Continued generation of electricity for the national grid	High (+)	High (+)
<i>Impact 2:</i> Health Risk from elevated PM 10 Concentrations	Medium	Low
Impact 3: Nuisance from elevated dustfall rates	Medium	Low

Table 9.17: Summary of identified impacts for the Operational Phase – Power Lines

	Significance					
Potential Impact	Power Co	orridor 3	Power C	orridor 4		
Potential Impact	Without	With	Without	With		
	Mitigation	Mitigation	Mitigation	Mitigation		
GEOLOGY						
Impact 1: Pollution of geological features in case						
of spillage or leakage of hydrocarbon and other	Medium	Low	Medium	Low		
hazardous material						
AGRICULTURAL POTENTIAL						
Impact 1: Loss or redistribution of top soil	Medium	Low	Medium	Low		
BIODIVERSITY						
Impact 1: Loss or degradation of natural/ pristine	Low	Low	Modium	Low		
habitat	LOW	LOW	Medium	LOW		
Impact 2: Loss/ Degradation of surrounding	Low	Low	Medium	Low		
habitat, species	LOW	LOW	Medium	LOW		
AVIFAUNA						
Impact 1: Electrocutions	low	Low	Low	Low		
Impact 2: Collisions	Medium	Low	Medium	Low		
Impact 2: Disturbance	low	low	Low	Low		
VISUAL						
Impact 1: Potential visual impact on sensitive						
visual receptors (i.e. users of roads and residents	low	low	Low	Low		
of homesteads and settlements) in close	10 W	10 W	LOW	LOW		
proximity to the proposed power line						
Impact 2: Potential visual impact on sensitive						
visual receptors (i.e. users of roads and residents	low	low	Low	low		
of homesteads and settlements) within the region						
SOCIAL						
Impact 1: Disruption of land use and loss of	Medium	Low	Medium	Low		
economic potential	riculuit		riculuiti	LOW		
Impact 2: Increase in health risk to residents	Low	Low	Low	Low		
from EMF	LOW	LOW	LOW			

Table 9.18: Summary of identified impacts for the Operational Phase – Pipeline

Detential Impact		Significa	nce
Potential Impact	Corrido	r 1	

	Without Mitigation	With Mitigation
GEOLOGY		
Impact 1: Pollution of geological features in case of spillage or leakage of hydrocarbon and other hazardous material	Medium	Low
BIODIVERSITY		
<i>Impact 1:</i> Direct impacts on common fauna & interactions with structures & personnel	Medium	low
Impact 2: Loss, or disruption of ecological connectivity	Medium	Low
Impact 3: Loss/ Degradation of surrounding habitat, species	Medium	Low
AVIFAUNA		
Impact 1: Disturbance	low	Low
Impact 2: Habitat destruction	low	low
SOCIAL		
Impact 1: Disruption of land use and loss of economic potential	Medium	Low

Table 9.19: Summary of identified impacts for the De-Commissioning Phase – Wet ash disposal facility

	S	ignificance
Potential Impact	Wet ash dis	posal facility – Site E
	Without Mitigation	With Mitigation
GROUNDWATER		
Impact 1: deterioration of groundwater quality due to leachate	Low	Low
Impact 2: Minor changes to local water table and local groundwater flow direction	Low	Low
SURFACE WATER		
Impact 1: Deterioration of water quality	Medium	Low
Impact 2: Storm water run-off	Medium	Low
BIODIVERSITY		
Impact 1: Direct impacts on common fauna & interactions	low	low
With structures & personnel	law	
Impact 2: Loss/ Degradation of surrounding habitat, species	IOW	IOW
VISUAL		
visual receptors (i.e. users of roads and residents of homesteads and settlements) in close proximity to the proposed wet ash disposal facility	Medium	Low
<i>Impact 2:</i> Potential visual impact of site works on sensitive visual receptors (i.e. users of roads and residents of homesteads and settlements) within the region	Low	Low
<i>Impact 3:</i> Potential visual impact of the rehabilitated wet ash disposal facility on sensitive visual receptors (i.e. users of roads and residents of homesteads and settlements) in close proximity to the proposed wet ash disposal facility	Medium	Medium
<i>Impact 4:</i> Potential visual impact of the rehabilitated wet ash disposal facility on sensitive visual receptors (i.e. users of roads and residents of homesteads and settlements) within the region	Low	Low

Table 9.20: Summary of identified impacts for the De-Commissioning Phase – Power Lines

	Significance			
Potential Impact Power C Without Mitigation	Power Corridor 3		Power Corridor 4	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
BIODIVERSITY				
Impact 1: Direct impacts on common fauna & interactions with structures & personnel	Low	Low	Low	Low
Impact 2: Loss/ Degradation of surrounding habitat, species	Low	Low	Medium	Low

Table 9.21: Summary of identified impacts for the De-Commissioning Phase – Pipeline

	Significance		
Detential Impact	Power Corridor 1		
Potential Impact	Without Mitigation	With Mitigation	
BIODIVERSITY			
<i>Impact 1:</i> Direct impacts on common fauna & interactions with structures & personnel	Low	low	
Impact 2: Loss, or disruption of ecological connectivity	Low	Low	
Impact 3: Loss/ Degradation of surrounding habitat, species	Medium	Low	

Table 9.22: Summary of identified cumulative impacts – Wet ash disposal facility

	Significance			
Potential Impact	Wet ash disposal facility – Site E			
	Without Mitigation	With Mitigation		
GROUNDWATER				
<i>Impact 1:</i> Deterioration of groundwater quality due to ash leachate	Medium	Low		
<i>Impact 2:</i> Rise in local water table and minor changes to local groundwater flow directions	Medium	Low		
SURFACE WATER				
Impact 1: Loss of wetland function	High	Medium		
Impact 2: Deterioration of water quality	High	Medium		
Impact 3: Erosion and sedimentation	Medium	Low		
BIODIVERSITY				
Impact 1: Impacts on SA's conservation obligations & targets	High	Medium		
Impact 2: Increase in local and regional fragmentation/ isolation of habitat	High Medium			
VISUAL				
<i>Impact 1:</i> Potential visual impact on sensitive visual receptors (i.e. users of roads and residents of homesteads and settlements) in close proximity to the proposed wet ash disposal facility	Medium Medium			
<i>Impact 2:</i> Potential visual impact on sensitive visual receptors (i.e. users of roads and residents of homesteads and settlements) within the region	Low Low			

Table 9.23: Summary of identified cumulative impacts – Power Lines

		Significance			
Potontial Impact	Power Corridor 3		Power Corridor 4		
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	
GROUNDWATER	· · · · · · · · · · · · · · · · · · ·			·	
Impact 1: Possible deterioration in local groundwater quality	low	low	Low	Low	
SURFACE WATER					
Impact 1: Deterioration of water quality	Medium	Low	Medium	Low	
Impact 2: Vegetation removal	Medium	Low	Medium	Low	
Impact 3: Increased surface run-off	Medium	Low	Medium	Low	
BIODIVERSITY					
<i>Impact 1:</i> Impacts on SA's conservation obligations & targets	Medium	Low	Medium	Low	
VISUAL		·			
<i>Impact 1:</i> Potential visual impact on sensitive visual receptors (i.e. users of roads and residents of homesteads and settlements) in close proximity to the proposed power line	low	low	low	Low	
<i>Impact 2:</i> Potential visual impact on sensitive visual receptors (i.e. users of roads and residents of homesteads and settlements) within the region	low	low	low	low	

Table 9.24: Summary of identified cumulative impacts – Pipeline

	Significance		
	Significance		
Detential Impact	Corridor 1		
Potential Impact	Without Mitigation	With Mitigation	
GEOLOGY			
Impact 1: Possible deterioration in local groundwater quality	Low	Low	
SURFACE WATER			
Impact 1: Deterioration of water quality	Low	Low	
Impact 2: Vegetation removal	Medium	Low	
Impact 3: Increased surface run-off	Medium	Low	
BIODIVERSITY			
Impact 1: Impacts on SA's conservation obligations & targets	Medium	low	
Impact 2: Increase in local and regional fragmentation/	Madium		
isolation of habitat	medium	LOW	

9.3 Impact Assessment Conclusions

9.3.1 Construction phase impacts

During the construction phase, the majority of impacts identified were considered to be of low significance in the event that the appropriate mitigation measures are implemented.

The following impacts were assessed to be of High significance without mitigation except for the loss of agricultural land that has been assessed with high significance with and without mitigation:

- Wet ash disposal facility
 - Agricultural land
 - Loss of agricultural land
 - Surface water
 - Loss of wetland function
 - Altered Hydrology
 - \circ $\;$ Loss of water resources down stream
 - Heritage
 - Destruction of Heritage sites and features

A total of five (5) impacts related to the construction of the wet ash disposal facility were assessed as having a high significance before the implementation of mitigation measures. After the implementation of mitigation measures the intensity levels of all impacts reduced significantly.

With regards to the construction of the powerlines and pipeline there where no impacts that were considered to be of a high significance, the majority where considered either medium or low before the implementation of mitigation measures. It is evident from the summary tables above that corridor 3 is the preferred corridor route for the power lines. This deduction has been made based on the results of all specialist studies. The preference seems to be unanimous.

9.3.2 Operational phase impacts

The majority of the impacts identified, associated with the operational phase were considered to be of low significance in the event that the appropriate mitigation measures are implemented.

The following impacts were assessed to be of high significance in the event that mitigation measures are not implemented as required:

- Wet ash disposal facility
 - Surface Water
 - Loss of water resources down stream
 - Changes in natural surface water flow patterns
 - Heritage
 - Destruction of heritage sites and features
 - o Social
 - Should the expansion of the wet ash disposal facilities proposed project be granted authorisation. The Hendrina Power Station will remain operational and continue to generate electricity which also feeds into the national grid.

With regards to the Wet ash disposal facility a total of four (4) impacts were assessed as having a high significance before the implementation of mitigation measures. After the implementation of mitigation measures the intensity levels of all impacts dropped, except for the social impact in terms of continued electricity generation, which is considered to be a positive impact.

With regards to the operational phase for the powerlines and pipeline there where no impacts that were considered to be of a high significance, the majority where considered either medium or low before the implementation of mitigation measures.

It is evident from the summary tables above that corridor 3 is the preferred corridor route for the power lines. This deduction has been made based on the results of all specialist studies. The preference seems to be unanimous.

9.3.3 Decommissioning phase impacts

As with the construction and operational phases, the majority of impacts identified associated with the de-commissioning phase were considered to be of low significance in the event that the appropriate mitigation measures are implemented.

No impacts were assessed as having a high significance before the implementation of mitigation measures.

Socio-Economic impacts were not assessed for the de-commissioning phase. It is also anticipated that all environmental impacts will be revisited at power station closure in order to update the impact analysis to take all new information and plans into account.

9.3.4 Cumulative Impacts

The majority of cumulative impacts identified associated with the project were considered to be of low significance in the event that the appropriate mitigation measures are implemented.

The following impacts were assessed to be of High significance in the event that mitigation measures are not implemented as required:

- Wet ash disposal facility
 - Surface water
 - Loss of wetland function
 - Deterioration of water quality
 - o Biodiversity
 - Impacts on SA's conservation obligations and targets
 - Increase in local and regional fragmentation / isolation of habitat

With regards to the wet ash disposal facility a total of four (4) cumulative impacts were assessed as having a high significance before the implementation of mitigation measures. After the implementation of mitigation measures the intensity levels of all impacts dropped.

As far as the power lines are concerned, it is evident from the summary tables above that corridor 3 is the preferred corridor route for the power lines. This deduction has been made based on the results of all specialist studies. The preference seems to be unanimous and through all phases of the project.

9.4 Final Specialist Conclusions

9.4.1 Air Quality

In conclusion, if unmitigated, the windblown dust from the wet ash disposal facility may result in significant PM10 ground level concentrations. As the background ambient PM10 ground level concentrations may also be elevated in the area (based on measured PM10 concentrations at Hendrina) it is recommended that the wet ash disposal facility be mitigated in order to minimise the impacts from this source on the surrounding environment.

Fugitive dust can easily be mitigated. It is recommended that the dust management measures as stipulated in the EMPr be applied to ensure the proposed activities have an insignificant impact on the surrounding environment and human health. It is also recommended that single dust fallout buckets be installed downwind of the tailings dam in order to monitor the impacts from this source.

9.4.2 Ground Water

The main impact on groundwater of the proposed ash disposal facility is likely to be a reduction in water quality beneath the site, and in the vicinity (most likely within a few hundred metres) of the site, if there are leakages from the facility. The numerical model results suggest that the movement of leachate away from the ash disposal facility should take place relatively slowly, with the surface water receiver being the drainage to the north west of the proposed ash disposal facility site. Less serious is the anticipated water table mounding beneath the site and the potential alteration of local groundwater flow directions. The construction of a low permeability liner system should greatly reduce the downward movement of leachate into the subsurface, if managed together with the under drain system. Another way to mitigate all of these impacts is to maintain the ash disposal facility in good condition (especially the drainage system) and to ensure that only ash slurry is disposed of i.e. no co-disposal in the facility. Once the ash disposal facility is decommissioned, it should be re-vegetated and the drainage system maintained to reduce downward movement of leachate. The impact of the construction of the water pipeline diversion or the electricity powerlines on groundwater is expected to be minimal, unless spills occur during construction or waste is disposed into the trenches or pits during the construction phase.

It is recommended that the ash disposal facility and leachate control system continue to be maintained after ash disposal has ceased. Monitoring and management of groundwater levels and quality in the vicinity of the ash dam, or as agreed with authorities, should be continued after ash dam closure, and if required the numerical model updated with the new data.

9.4.3 Surface Water

Ash management inherently carries environmental risk, particularly to surface and ground water systems. The extent of the proposed development in relation to the extent of other uses in the water management area adds to cumulative impacts on the Olifants system. The Olifants system is compromised and any additional strain on surface water ecology should be considered in this light. Thus, the remaining ecological integrity associated with the Woest-Alleenspruit is of particular importance on a catchment scale. However, the surface water study carried out in July 2011 indicated that wetlands associated with the study area are in a modified to largely modified state. In light of the PES, retained functionality, EIS and environmental least cost associated with Alternative E, it is the opinion of the specialist that the project can be executed without further impeding ecological integrity of wetlands located outside of the primary study area.

9.4.4 Biodiversity

It is evident that direct impacts associated with the various phases of the project are mostly restricted to the physical activities associated with construction, and to some extent, activities associates with the decommissioning phase (rehabilitation). Indirect as well as direct impacts are mostly restricted to the site and immediate surrounds.

The implementation of generic mitigation measures are expected to ameliorate impacts to an acceptable significance. In selected areas, mostly associated with wetland related habitat, will the success of mitigation measures be of a moderate nature.

9.4.5 Avifauna

From an avifaunal perspective, the overhead power-line poses the greatest threat to the majority of the red-listed focal species identified. 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 they be mitigated for as per this report and the use of the Construction EMPr.
- Collisions are expected to be the largest impact of this project and thorough line marking is required to mitigate for this, regardless of which line option (3 or 4) is chosen.
- Over-head power-line alternative 3, appears to pass through less sensitive areas, and is more preferred.
- An "avifaunal walk through" is recommended in order to identify the exact spans of line for marking to mitigate for bird collisions.
- Provided that the high risk sections of line are mitigated in the form of marking, the impact should be contained. The EWT, through its partnership with Eskom and ongoing international networking, is well aware of the room for improvement on the effectiveness of line marking devices. However, it is our view that currently available devices, although not 100 % effective, would provide an acceptable level of mitigation for this project.
- Provided that a bird-friendly monopole structure is used for all new pylon structures in the project, as discussed elsewhere in the report, the impact of electrocution should be contained.

9.4.6 Visual

The construction and operation of the proposed wet ash disposal facility and its associated infrastructure will have an impact on the visual environment especially within, 1km of the proposed site, but also within the greater region.

The wet ash disposal facility would be visible within an area that incorporates certain sensitive visual receptors. Such visual receptors include people travelling along roads, residents of homesteads and settlements and tourists visiting the region.

It is noteworthy that a high level of industrial, mining and electrical infrastructure is already present in close proximity to the proposed site. The Hendrina Power Station and the existing wet ash disposal facilities south east of the proposed site are of particular relevance in this regard, as they render the immediate visual environment already impacted upon. As a result, the visual prominence of the proposed wet ash disposal facility is expected to be absorbed somewhat.

9.4.7 Heritage

The aim of the survey was to locate, identify, evaluate and document sites, objects and structures of cultural significance found within the area in which it is proposed to develop the wet ash disposal facility and the rerouting of existing infrastructure.

The cultural landscape qualities of the region essentially consist of one component. The first is a rural area in which the human occupation is made up of a pre-colonial element (Iron Age) as well as a much later colonial (farmer and industrial) component.

Two cemeteries were identified, one of which would be impacted on by the proposed ash disposal facility.

Based on current information regarding sites in the surrounding area, all sites known to
occur in the study region are judged to have Grade III significance and therefore would not
prevent the proposed development for continuing after the implementation of the proposed
mitigation measures and its acceptance by SAHRA.

Therefore, from a heritage point of view it is recommended that the proposed development can continue. However, a request that if archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

9.4.8 Powerline Alternatives

Alternative corridors were assessed for the relocation of the three power lines (and one possible future addition) that currently traverse the site. **Figure 9.1** provides a map of the alternatives that were identified and assessed. Through the assessment it is clear that on the whole the impacts associated with corridor 3 have a lower significance and is thus considered more preferred. It is recommended that Eskom consider this alternative as the preferred, however it is essential to take the health and safety risks related to working in close proximity to the power lines into account.

As of 7 February 2013, the project team was made aware of the existence of a new powerline alignment that is to traverse Alternative E (preferred EIA site). The project team is aware that an Environmental Authorisation has been granted and a servitude negotiated with the landowner, however, the project team still await the specific project details in terms of exact location of this powerline. The powerline (new) can be relocated together with the power lines (corridors) assessed above within the same new proposed alignments.



Figure 9.1: Map showing the corridor alternatives for the relocation of the power lines