

APPENDIX K: IMPACT ASSESSMENT METHODOLOGY

1.1 Specialist Impact Assessments

A series of specialist studies were conducted during the Basic Assessment Phase, the outcomes of which are provided in the Basic Assessment Report. The team of specialists provided baseline information through desktop analyses and site visits; addressed relevant issues raised by I&APs; identified and assessed potential impacts associated with the proposed project activities within their field of expertise; and provided proposed mitigation measures for the impacts identified. The specialist reports were compiled in accordance with Appendix 6 of the 2014 EIA Regulations.

Table 1: Specialist Studies completed for the Basic Assessment Report.

Specialist Field	Specialist		Peer reviewed
Archaeological and Heritage Impact Assessment	Ms Celeste Booth	Booth Heritage Consulting	No
Avifaunal Impact Assessment	Dr Tony Williams	African Insights	No
Ecological Impact Assessment	Mr Simon Todd	Simon Todd Consulting	No

1.2 Methodology for Assessing the Duration and Significance of Impacts

To ensure a direct comparison between various specialist studies, a standard rating scale has been defined and will be used to assess and quantify the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed. Four factors need to be considered when assessing the significance of impacts, namely:

1. Relationship of the impact to **temporal** scales - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
2. Relationship of the impact to **spatial** scales - the spatial scale defines the physical extent of the impact.
3. The severity of the impact - the **severity/beneficial** scale is used in order to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on a particular affected system (for ecological impacts) or a particular affected party. The severity of impacts can be evaluated with and without mitigation in order to demonstrate how serious the impact is when nothing is done about it. The word 'mitigation' means not just 'compensation', but also the ideas of containment and remedy. For beneficial impacts, optimization means anything that can enhance the benefits. However, mitigation or optimization must be practical, technically feasible and economically viable.
4. The **likelihood** of the impact occurring - the likelihood of impacts taking place as a result of project actions differs between potential impacts. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

Each criterion is ranked with scores assigned as presented in Table 8-2 to determine the overall **significance** of an activity. The criterion is then considered in two categories, viz. effect of the activity and the likelihood of the impact. The total scores recorded for the effect and likelihood are then read off the matrix presented in Table 8-3, to determine the overall significance of the impact (Table 1). The overall significance is either negative or positive.

The **environmental significance** scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society.

Negative impacts that are ranked as being of “**VERY HIGH**” and “**HIGH**” significance will be investigated further to determine how the impact can be minimised or what alternative activities or mitigation measures can be implemented. These impacts may also assist decision makers i.e. lots of **HIGH** negative impacts may bring about a negative decision.

For impacts identified as having a negative impact of “**MODERATE**” significance, it is standard practice to investigate alternate activities and/or mitigation measures. The most effective and practical mitigations measures will then be proposed.

For impacts ranked as “**LOW**” significance, no investigations or alternatives will be considered. Possible management measures will be investigated to ensure that the impacts remain of low significance.

Table 2: Criterion used to rate the significance of an impact.

	Temporal scale		Score
		Short term	Less than 5 years
	Medium term	Between 5 and 20 years	2
	Long term	Between 20 and 40 years (a generation) and from a human perspective almost permanent.	3
	Permanent	Over 40 years and resulting in a permanent and lasting change that will always be there	4
Spatial Scale			
	Localised	At localised scale and a few hectares in extent	1
	Project area	The proposed site and its immediate environs	2
	Regional	District and Provincial level	3
	National	Country	3
	International	Internationally	4
EFFECT	Severity		Benefit
	Slight / Slightly Beneficial	Slight impacts on the affected system(s) or party (ies)	Slightly beneficial to the affected system(s) or party (ies)
	Moderate / Moderately Beneficial	Moderate impacts on the affected system(s) or party(ies)	An impact of real benefit to the affected system(s) or party (ies)
	Severe / Beneficial	Severe impacts on the affected system(s) or party (ies)	A substantial benefit to the affected system(s) or party (ies)
	Very Severe / Very Beneficial	Very severe change to the affected system(s) or party(ies)	A very substantial benefit to the affected system(s) or party (ies)
LIKELIHOOD	Likelihood		
	Unlikely	The likelihood of these impacts occurring is slight	
	May Occur	The likelihood of these impacts occurring is possible	
	Probable	The likelihood of these impacts occurring is probable	
	Definite	The likelihood is that this impact will definitely occur	

Table 3: The matrix that will be used for the impacts and their likelihood of occurrence

LIKELIHOOD		Effect															
		3	4	5	6	7	8	9	10	11	12	13	14	15	16		
D	1	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
	3	6	7	8	9	10	11	12	13	14	15	16	17	18	19		
	4	7	8	9	10	11	12	13	14	15	16	17	18	19	20		

Table 4: The significance rating scale

Significance	Description
Low	Acceptable impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in either positive or negative medium to short term effects on the social and/or natural environment.
Moderate	An important impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in either a positive or negative medium to long-term effect on the social and/or natural environment.
High	A serious impact, if not mitigated, may prevent the implementation of the project (if it is a negative impact). These impacts would be considered by society as constituting a major and usually a long-term change to the (natural &/or social) environment and result in severe effects or beneficial effects.
Very High	A very serious impact which, if negative, may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are un-mitigable and usually result in very severe effects, or very beneficial effects.

1.3 Irreversible or irreplaceable impacts

Unless discussed or indicated in key project issues, findings and impacts, irreversible or irreplaceable impacts are considered as not applicable to the study.

1.4 Cumulative Impacts

Project induced cumulative impacts should be considered, along with direct and indirect impacts, in order to better inform the developer's decision making and project development process. The NEMA 2014 EIA Regulations defines cumulative impacts as "in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, than in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities". Cumulative impacts result from incremental changes caused by other past, present or reasonably foreseeable actions acting in concert with the project. Individually minor impacts from different developments can interact in various ways over time to become collectively significant. Barbour (2007: 39), adapting work by Cooper, 2004, describes cumulative impacts as impacts which "may be:

- **Additive:** the simple sum of all the effects (e.g. the accumulation of ground water pollution from various developments over time leading to a decrease in the economic potential of the resource);
- **Synergistic:** effects interact to produce a total effect greater than the sum of individual effects. These effects often happen as habitats or resources approach capacity (e.g. the accumulation of water, air and land degradation over time leading to a decrease in the economic potential of an area);
- **Time crowding:** frequent, repetitive impacts on a particular resource at the same time (e.g. multiple boreholes decreasing the value of water resources);
- **Neutralizing:** where effects may counteract each other to reduce the overall effect (e.g. infilling of a wetland for road construction, and creation of new wetlands for water treatment); and,
- **Space crowding:** high spatial density of impacts on an ecosystem (e.g. rapid informal

residential settlement).”

Cumulative impacts are, however, difficult to accurately and confidently assess, owing to the high degree of uncertainty, as well as it often being based on assumptions. It is therefore difficult to provide as detailed an assessment of cumulative impacts as is the case for direct and indirect project induced impacts. This is usually because of the absence of specific details and information related to cumulative impacts. In these situations, the EAP ensured that any assumptions made as part of the assessment are made clear. Accordingly, the Basic Assessment Report includes an overview and analysis of cumulative impacts related to a variety of project actions, and does not provide a quantitative significance rating for these impacts, as was done for direct project induced impacts. The objective is to identify and focus on potentially significant cumulative impacts so these may be taken into consideration in the decision-making process. It is important to realise these constraints, and to recognise that the assessment will not, and indeed cannot, be perfect. The potential for cumulative impacts will, however, be considered, rather than omitted from the decision making-process and is therefore of value to the project and the environment.

Figure 1 below provides the cumulative electrical infrastructure of the proposed project.

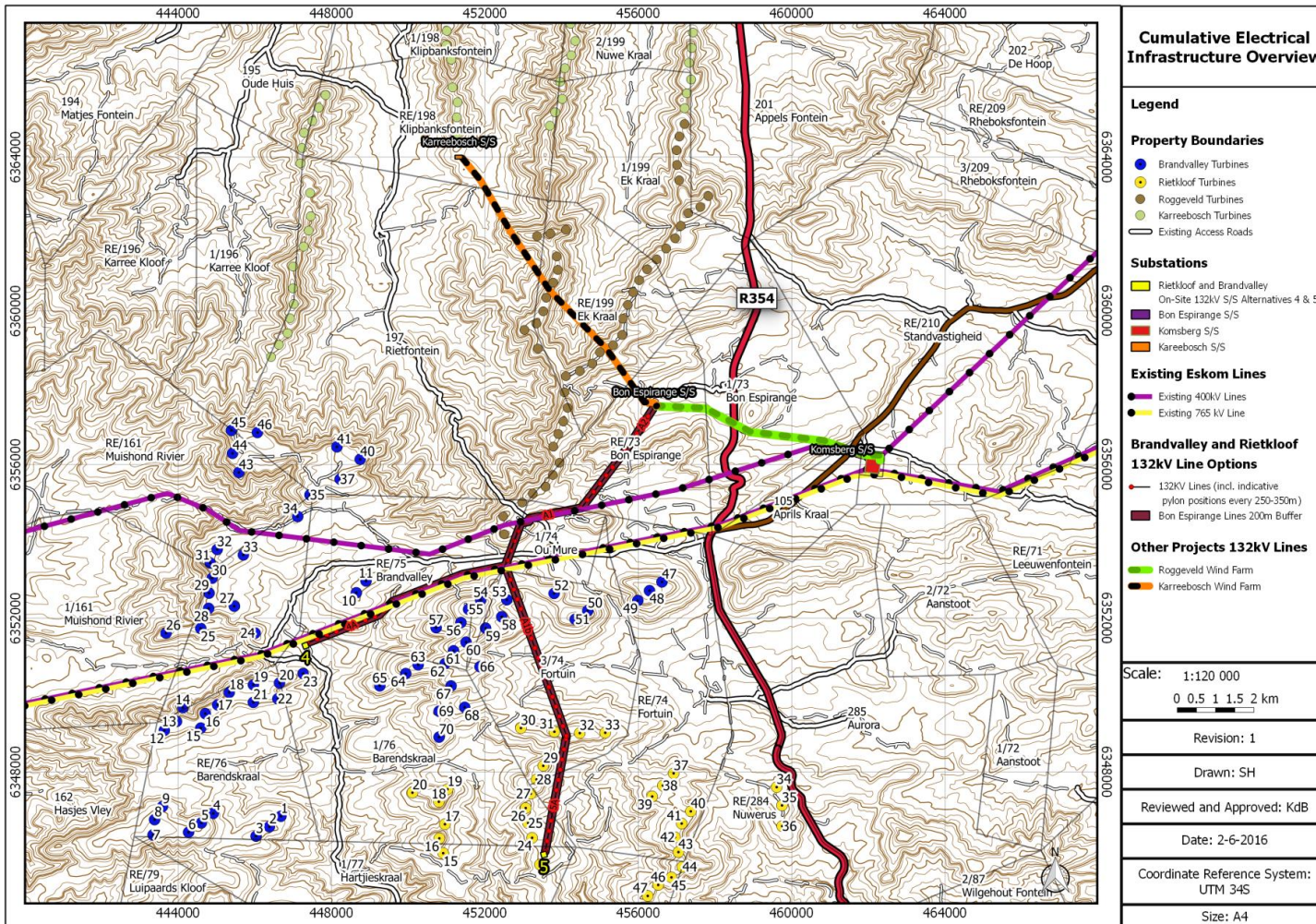


Figure 1: The proposed Rietkloof project site (Preferred Alternative) in relation to other electrical infrastructure project

