

Specialist Terms of Reference

Ecology: Sustainable Development ProjectsCC

APPOINTMENT AS A SUB-CONSULTANT ON A ZITHOLELE PROJECT : BA for the proposed Pongola–Candover 132kV power line, upgrades to the Pongola Substation and Candover switching station, development of the Golela 132/22 kV substation and linking 132kV transmission lines in the uPhongola and Jozini Local Municipalities

1 REFERENCE DOCUMENTATION

With reference to your proposal of 7 November 2011 we hereby appoint Sustainable Development Projects (SDP) to carry out the specified scope of work, according to the defined schedule and to provide the approved deliverables within the proposed budget. SDP is appointed through this sub-consultant agreement to carry out a Ecological Impact Assessment that complies with:

1. National Environmental Management: Biodiversity Act (No. 10 of 2004);
2. The scope of work as outlined in the Specialist Request for Proposal (Zitholele Report: 12722-PCG Specialist Study RFP-v3-wk-4Nov11.pdf);
3. The quotation provided by SDP in their document titled: Pongola-Candover-Golela 132kV Powerline and Associated Infrastructure Project.

The sub-consulting work is to be carried out according to the attached “Conditions of Engagement”.

2 STUDY APPROACH

The approach to be utilised will consist of the following process:

- Baseline Studies of the Study Area:
 - Undertake desktop studies and mapping using available information;
 - Undertake site visits and appropriate data verification to inform the rating of the study area;
 - Undertake mapping and rating of the study area. Rating system to consist of 3 categories (Yellow = High Impact on the environment Orange = Very High Impact on the environment; Red = preferably No-Go area);
 - Two rated layers must be generated. One showing the impact of the power line on the receiving environment, and a second showing the impact of the environment on the power line;

- Identification and Evaluation of potential corridors / substation sites;
 - Presentation of findings of the baseline studies at a joint specialist workshop to Identify corridor / substation location alternatives; and
 - To inform two preferred corridors / substation sites selection for more detailed investigation and comparison;
- Assessment of two most feasible alternatives:
 - Undertake more detailed field work of two most feasible substation site / power line corridors alternatives;
 - Impact assessment and comparative assessment of two most feasible alternative corridors / substation sites;
- Corridor selection and final impact statement; and
- Report compilation.

3 BASELINE ASSESSMENT

Desktop studies and field surveys must be carried out over the entire study area.

Cognisance must be taken of the nature of development and as such baseline studies should be ideally scoped. The baseline studies will be utilised to identify feasible power line corridors on which a comparative assessment will be undertaken. Baseline studies must:

- Characterise the existing state of the environment within your specialist domain highlighting key sensitivities, opportunities, and environmental impacts to Eskom;
- Ensure that all information presented in the baseline assessment is relevant to the assessment;
- Identify and quantify potential impacts of the environment on the power line and its construction / operation and maintenance;
- List all the variables that are needed to characterise the baseline and define an existing state for each of these variables.

4 IMPACT ASSESSMENT METHODOLOGY

The impact assessment is conducted by determining how the proposed activities will affect the state of the environment previously described. Specific requirements are:

- Undertake a comparative assessment of the two most feasible corridor and substation positions, identifying and quantifying the environmental and/or social aspects of the various activities associated with the proposed project;
- Assess the impacts that may accrue and the significance of those impacts using the methodology as described below in **Error! Reference source not found.**; and

- Identify and assess cumulative impacts utilising the same rating system.

5 MANAGEMENT PLAN

SDP will compile a management plan documenting measures that will mitigate negative impacts or increase the likelihood of positive impacts. Specific requirements are:

- The management plan must comply with the requirements of the NEMA and NEM:BA;
- Detail whether the mitigation will reduce the intensity of the impact or the probability of the impact;
- Always specify a 'performance' expectation for the mitigation allowing some latitude for adaptive environmental management;
- Define associated monitoring requirements that will provide a clear indication of whether the mitigation is effective or not; and
- Detail specific legal provisions that need to be met for your specialist field.

To ensure uniformity, the assessment of impacts is addressed in a standard manner so that a wide range of impacts can be compared with each other. For this reason a clearly defined significance rating scale is provided to assess the significance (importance) of the associated impacts. The scale embraces the notion of extent and magnitude, but does not always clearly define these since their importance in the rating scale is very relative. For example, the magnitude (i.e. the size) of an area affected by atmospheric pollution may be extremely large (1000 km²) but the significance of this effect is dependent on the concentration or level of pollution. If the concentration were great, the significance of the impact would be HIGH or VERY HIGH, but if it were dilute it would be LOW or VERY LOW. Similarly, if 60 ha of a grassland type are destroyed the impact would be VERY HIGH if only 100 ha of that grassland type was known. The impact would be VERY LOW if the grassland type were common.

The potential significance of every environmental impact identified is determined by using a ranking scale, based on the following (the terminology is extracted from the DEAT guideline document on EIA Regulations, April 1998):

Occurrence

- Probability of occurrence (how likely is it that the impact may occur?), and
- Duration of occurrence (how long may it last?)

Severity

- Magnitude (severity) of impact (will the impact be of high, moderate or low severity?), and
- Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?).

In order to assess each of these factors for each impact, the following ranking scales were used:

Probability:

5 – Definite/don't know
4 – Highly probable
3 – Medium probability
2 – Low probability
1 – Improbable
0 – None

Duration:

5 – Permanent
4 – Long-term (ceases with the operational life)
3 – Medium-term (5-15 years)
2 – Short-term (0-5 years)
1 – Immediate

Scale:

5 – International
4 – National
3 – Regional (>5km)
2 – Local (<5km)
1 – Site only
0 – None

Magnitude:

10 – Very high/don't know
8 – High
6 – Moderate
4 – Low
2 – Minor

Once the above factors had been ranked for each impact, the environmental significance of each was assessed using the following formula:

$$SP = (\text{magnitude} + \text{duration} + \text{scale}) \times \text{probability}$$

The maximum value is 100 significance points (SP). Environmental effects were rated as either of high, moderate or low significance on the following basis:

- More than 60 significance points indicated high environmental significance.
- Between 30 and 60 significance points indicated moderate environmental significance.
- Less than 30 significance points indicated low environmental significance.

High = H	Moderate = M	Low = L
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Please note that **only negative impact will be ranked**

The degree of certainty of the assessment was judged on the following criteria:

Definite:	More than 90% sure of a particular fact.
Probable:	Between 70 and 90% sure of a particular fact, or of the likelihood of that impact occurring.
Possible:	Between 40 and 70% sure of a particular fact or of the likelihood of an impact occurring.
Unsure:	Less than 40% sure of a particular fact or the likelihood of an impact occurring.

Figure 1: Impact Assessment Methodology.

6 DELIVERABLES

Reports are to be submitted in MS Word Format. The broad structure of the report should include the following sections:

- Introduction;
- Description of the project;
- Legal requirements;
- Description of the method used to conduct the specialist assessment;
- The baseline environment;
- Activities and aspects of the proposed prospecting (as relevant to the specialist study);
- Impact assessment;
- Management Plan;
- Summary and conclusions; and
- Details of the specialist and declaration that the specialist is independent.

One report is required and can be submitted in three phases:

- Phase 1: Baseline Information;
- Phase 2: Impact Assessment and Management Plan;
- Phase 3: Consolidated Final Report.

Each report will be submitted in Draft to Zitholele for review prior to finalisation of the report.

Heritage: PGS Heritage and Grave Relocation Consultants

APPOINTMENT AS A SUB-CONSULTANT ON A ZITHOLELE PROJECT : BA for the proposed Pongola–Candover 132kV power line, upgrades to the Pongola Substation and Candover switching station, development of the Golela 132/22 kV substation and linking 132kV transmission lines in the uPhongola and Jozini Local Municipalities

7 REFERENCE DOCUMENTATION

With reference to your proposal of 14 November 2011 we hereby appoint PGS Heritage and Grave Relocation Consultants (PGS) to carry out the specified scope of work, according to the defined schedule and to provide the approved deliverables within the proposed budget. PGS is appointed through this sub-consultant agreement to carry out a Heritage Impact Assessment (HIA) that complies with:

4. Section 38 of the National heritage Resources Act ([NHRA] No 25 of 1999);
5. The scope of work as outlined in the Specialist Request for Proposal (Zitholele Report: 12722-PCG Specialist Study RFP-v3-wk-4Nov11.pdf);
6. The quotation provided by PGS in there document titled: HeritHeritage Proposal - Zitholele - HIA Pongola-Candover-Golela 132kv - QU1207&1208.pdf.

The sub-consulting work is to be carried out according to the attached “Conditions of Engagement”.

8 STUDY APPROACH

The approach to be utilised will consist of the following process:

- Baseline Studies of the Study Area:
 - Undertake desktop studies and mapping using available information;
 - Undertake site visits and appropriate data verification to inform the rating of the study area;
 - Undertake mapping and rating of the study area. Rating system to consist of 3 categories (Yellow = High Impact on the environment Orange = Very High Impact on the environment; Red = preferably No-Go area);
 - Two rated layers must be generated. One showing the impact of the power line on the receiving environment, and a second showing the impact of the environment on the power line;
- Identification and Evaluation of potential corridors / substation sites;

- Presentation of findings of the baseline studies at a joint specialist workshop to Identify corridor / substation location alternatives; and
- To inform two preferred corridors / substation sites selection for more detailed investigation and comparison;
- Assessment of two most feasible alternatives:
 - Undertake more detailed field work of two most feasible substation site / power line corridors alternatives;
 - Impact assessment and comparative assessment of two most feasible alternative corridors / substation sites;
- Corridor selection and final impact statement; and
- Report compilation.

9 BASELINE ASSESSMENT

Desktop studies and field surveys must be carried out over the entire study area.

Cognisance must be taken of the nature of development and as such baseline studies should be ideally scoped. The baseline studies will be utilised to identify feasible power line corridors on which a comparative assessment will be undertaken. Baseline studies must:

- Characterise the existing state of the environment within your specialist domain highlighting key sensitivities, opportunities, and environmental impacts to Eskom;
- Ensure that all information presented in the baseline assessment is relevant to the assessment;
- Identify and quantify potential impacts of the environment on the power line and its construction / operation and maintenance;
- List all the variables that are needed to characterise the baseline and define an existing state for each of these variables.

10 IMPACT ASSESSMENT METHODOLOGY

The impact assessment is conducted by determining how the proposed activities will affect the state of the environment previously described. Specific requirements are:

- Undertake a comparative assessment of the two most feasible corridor and substation positions, identifying and quantifying the environmental and/or social aspects of the various activities associated with the proposed project;
- Assess the impacts that may accrue and the significance of those impacts using the methodology as described below in **Error! Reference source not found.**; and
- Identify and assess cumulative impacts utilising the same rating system.

11 MANAGEMENT PLAN

PGS will compile a management plan documenting measures that will mitigate negative impacts or increase the likelihood of positive impacts. Specific requirements are:

- The management plan must comply with the requirements of the NEMA and NHRA;
- Detail whether the mitigation will reduce the intensity of the impact or the probability of the impact;
- Always specify a 'performance' expectation for the mitigation allowing some latitude for adaptive environmental management;
- Define associated monitoring requirements that will provide a clear indication of whether the mitigation is effective or not;
- Detail specific legal provisions that need to be met for your specialist field.

To ensure uniformity, the assessment of impacts is addressed in a standard manner so that a wide range of impacts can be compared with each other. For this reason a clearly defined significance rating scale is provided to assess the significance (importance) of the associated impacts. The scale embraces the notion of extent and magnitude, but does not always clearly define these since their importance in the rating scale is very relative. For example, the magnitude (i.e. the size) of an area affected by atmospheric pollution may be extremely large (1000 km²) but the significance of this effect is dependent on the concentration or level of pollution. If the concentration were great, the significance of the impact would be HIGH or VERY HIGH, but if it were dilute it would be LOW or VERY LOW. Similarly, if 60 ha of a grassland type are destroyed the impact would be VERY HIGH if only 100 ha of that grassland type was known. The impact would be VERY LOW if the grassland type were common.

The potential significance of every environmental impact identified is determined by using a ranking scale, based on the following (the terminology is extracted from the DEAT guideline document on EIA Regulations, April 1998):

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Scale:

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- 3 – Regional (>5km)
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- 1 – Site only
- 0 – None

Magnitude:

- 10 – Very high/don't know
- 8 – High
- 6 – Moderate
- 4 – Low
- 2 – Minor

Once the above factors had been ranked for each impact, the environmental significance of each was assessed using the following formula:

$$SP = (\text{magnitude} + \text{duration} + \text{scale}) \times \text{probability}$$

The maximum value is 100 significance points (SP). Environmental effects were rated as either of high, moderate or low significance on the following basis:

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Please note that **only negative impact will be ranked**

The degree of certainty of the assessment was judged on the following criteria:

Definite:	More than 90% sure of a particular fact.
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Possible:	Between 40 and 70% sure of a particular fact or of the likelihood of an impact occurring.
Unsure:	Less than 40% sure of a particular fact or the likelihood of an impact occurring.

Figure 2: Impact Assessment Methodology.

12 DELIVERABLES

Reports are to be submitted in MS Word Format. The broad structure of the report should include the following sections:

- Introduction;
- Description of the project;
- Legal requirements;
- Description of the method used to conduct the specialist assessment;
- The baseline environment;
- Activities and aspects of the proposed prospecting (as relevant to the specialist study);
- Impact assessment;
- Management Plan;
- Summary and conclusions; and
- Details of the specialist and declaration that the specialist is independent.

One report is required and can be submitted in three phases:

- Phase 1: Baseline Information;
- Phase 2: Impact Assessment and Management Plan;
- Phase 3: Consolidated Final Report.

Each report will be submitted in Draft to Zitholele for review prior to finalisation of the report.

Surface Water and Visual Impact Assessment: Jones and Wagener

APPOINTMENT AS A SUB-CONSULTANT ON A ZITHOLELE PROJECT : PONGOLA CANDOVER 132KV POWER LINE

With reference to your proposal of 25 SEPTEMBER 2012 we hereby appoint you to carry out the specified scope of work, according to the defined schedule and to provide the approved deliverables within the proposed budget.

The sub-consulting work is to be carried out according to the attached “Conditions of Engagement” and shall fulfil the following criteria.

13 SCOPE OF WORK

13.1 Specialist study approach

The following general approach to the specialist studies is suggested, deviations from this procedure, and reasons therefore must be clearly indicated in the proposal:

- Baseline Studies of the Study Area:
 - Undertake desktop studies and mapping using available information;
 - Undertake site visits and appropriate data verification to inform the rating of the study area;
 - Undertake mapping and rating of the study area. Rating system to consist of 3 categories (Yellow = High Impact on the environment, Orange = Very High Impact on the environment; Red = preferably No-Go area);
 - Two rated layers must be generated. One showing the impact of the power line on the receiving environment, and a second showing the impact of the environment on the power line;
- Identification and Evaluation of potential corridors / substation sites;
 - Presentation of findings of the baseline studies at a joint specialist workshop to identify corridor / substation location alternatives; and
 - To inform two preferred corridors / substation sites selection for more detailed investigation and comparison;
- Assessment of three most feasible alternatives:
 - Undertake more detailed field work of two most feasible substation site / power line corridors alternatives;
 - Impact assessment and comparative assessment of two most feasible alternative corridors / substation sites;
- Corridor selection and final impact statement; and
- Report compilation

13.2 Baseline assessment

Desktop studies and field surveys should be carried out over the entire study area. Cognisance must be taken of the nature of development and as such baseline studies should be ideally scoped. The baseline studies will be utilised to identify feasible power line corridors on which a comparative assessment will be undertaken. Baseline studies must:

- Characterise the existing state of the environment within your specialist domain highlighting key sensitivities, opportunities, and environmental impacts to Eskom;
- Ensure that all information presented in the baseline assessment is relevant to the assessment;
- Identify and quantify potential impacts of the environment on the power line and its construction / operation and maintenance;
- List all the variables that are needed to characterise the baseline and define an existing state for each of these variables.

13.3 Impact assessment methodology

The impact assessment is conducted by determining how the proposed activities will affect the state of the environment previously described. Specific requirements are:

- Undertake a comparative assessment of the two most feasible corridor and substation positions, identifying and quantifying the environmental and/or social aspects of the various activities associated with the proposed project;
- Assess the impacts that may accrue and the significance of those impacts using the methodology as supplied; and
- Identify and assess cumulative impacts utilising the same rating system.

13.4 Management plan

Each specialist will be required to compile a management plan documenting measures that will mitigate negative impacts or increase the likelihood of positive impacts, Specifics in your specialist field should be discussed in detail. Specific requirements are:

- The management plan must comply with the requirements of the NEMA;
- Detail whether the mitigation will reduce the intensity of the impact or the probability of the impact;
- Always specify a 'performance' expectation for the mitigation allowing some latitude for adaptive environmental management;
- Define associated monitoring requirements that will provide a clear indication of whether the mitigation is effective or not;

- Detail specific legal provisions that need to be met for your specialist field.

13.5 Study specific details

Study specific details for the various specialist components are documented in Table 1.

Table 1: Specialist study specific details

Surface Water	<i>Surface water over the entire study area.</i> The surface water features over the entire study area (including wetlands, perennial and non-perennial rivers, pans and dams) must be identified and mapped. The wetlands needs to be identified and mapped using the DWAF, 2005 delineation methodology.
Topography and Visual Impact	<i>Generate a DEM of the study area.</i> Using available relief information a DEM will be generated of the study area to be utilized in the identification of topographically sensitive areas that may also pose an impact from the environment to the construction of the power line. Using the DEM a viewshed analysis and visual impact assessment will also be undertaken
GIS	<i>Mapping and analysis.</i> The mapping and analysis of all the various specialist studies to determine the ideal corridor. A GIS analysis comprising of overlay analysis, composite mapping, and negative mapping will be undertaken.

14 DELIVERABLES

Reports are to be submitted in MS Word Format. The broad structure of the report should include the following sections:

- Introduction;
- Description of the project;
- Legal requirements;
- Description of the method used to conduct the specialist assessment;
- The environmental baseline;
- Activities and aspects of the proposed prospecting (as relevant to the specialist study):
- Impact assessment;
- Management Plan;
- Summary and conclusions; and
- Details of the specialist and declaration that the specialist is independent.

One report is required and can be submitted in three phases:

- Phase 1: Baseline Information;
- Phase 2: Impact Assessment and Management Plan;
- Phase 3: Consolidated Final Report.

Each report will be submitted in Draft to Zitholele for review prior to finalisation of the report.