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Our Ref : 12935-45-Eng-010

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Eskom SOC Ltd.

By E-mail

Attention : Ms Emmy Molepo

Dear Madam,

**Comparative Assessment for the Re-routing of 18" Transnet Pipeline at the Proposed Eskom Kendal Power Station 30 Year Ash Dump Facility Site**

**BACKGROUND**

Zitholele Consulting has been appointed by Eskom SOC Ltd. to undertake Environmental Authorisation processes for the proposed Kendal 30 Year Ash Disposal Facility (ADF) project. A site selection process was undertaken and the outcome revealed that Site H as the preferred site as it is the site that is the least affected by mining and it is also the site that is closest to the Kendal Power Station site.

An existing 18 inch / 450 mm diameter Transnet steel diesel pipeline traverses Site H and runs, directionally, from the south west side of the site to the north east. The existing pipeline runs directly under the proposed footprint area of the ADF.

**OPTIONS CONSIDERED**

Three options were considered in order to accommodate the ADF on the preferred footprint taking into consideration the presence of the aforementioned pipeline. These are as follows:

**Option 1:** The pipeline is discontinued throughout the entire length it traverses under the proposed footprint. This portion of the pipeline is replaced by diverting it to the west of the proposed ADF complex as shown on concept Dwg No 12935/03-09 P00. An alternative to this approach will be to divert the pipeline to the east of the facility however space is limited and the length of the deviation would be significantly longer.

**Option 2:** The pipeline remains in place with a protective culvert being constructed over it. Adequate allowance will be provided in the culvert for routine maintenance of the pipeline. Ashing operations will be on top of the culvert. Dwg No 12935/03-10 P00 conceptualises this proposal.

**Option 3:** The pipeline remains in place and the ADF is split into two such that the nearest toe of each facility is outside the servitude of the pipeline. This is shown on Dwg No 12935/03-11 P00.

**Option 4:** The pipeline remains in place and the ADF is stopped to the east of the pipeline such that the nearest toe of each facility is outside the servitude of the pipeline. This is shown on Dwg No 12935/03-12 P00.

### CAPITAL COST ESTIMATE

High level capital costs estimates were undertaken for the accommodation of the pipeline and is shown on the table below. The costs only include for protection or deviation of the pipeline.

Option	Description	Cost (Rm)
<b>Option 1</b>	Deviate pipeline around the footprint of the ADF complex	80
<b>Option 2</b>	Leave the pipeline in place and protect it by constructing a culvert over it	234
<b>Option 3</b>	Leave the pipeline in place and split the ADF such that its toe is outside the servitude of the pipeline	0
<b>Option 4</b>	Leave the pipeline in place and stop the ADF to the east of the pipeline such that its toe is outside the servitude of the pipeline	0

## AIR SPACE IMPLICATIONS

Certain options proposed above will compromise the years of air space achieved on the ADF. The table below gives you the number of years of air space lost on implementation of the respective option.

Option	Description	Air Space Lost (Time)
Option 1	Deviate pipeline around the footprint of the ADF complex	0
Option 2	Leave the pipeline in place and protect it by constructing a culvert over it	1 month
Option 3	Leave the pipeline in place and split the ADF such that its toe is outside the servitude of the pipeline	4.5 years
Option 4	Leave the pipeline in place and stop the ADF to the east of the pipeline such that its toe is outside the servitude of the pipeline	8.5 years

It should be noted that five (5) years of contingency has been built into the current volume of the ADF.

## COMPARATIVE ASSESSMENT

A comparative assessment of the above four options were done. The following criteria were assessed for each of the Options:

- Risk – damage to pipeline or not achieving desired ADF airspace
- Engineering difficulty
- Environmental implications
- Interruptions to ADF operations
- Capital cost

Each of the Options were scored on the above criteria using the following scoring system:

<i>Fatal flaw</i>	0
<i>Unacceptable</i>	1
<i>Acceptable</i>	2
<i>Good</i>	3

The table below shows the comparative matrix and the results achieved:

Options	Risk (damage to pipeline or not achieving desired air space)	Engineering Difficulty	Environmental Implications	Interruption to ADF Operations	Cost	Weighted Score	Rank
	35%	10%	10%	10%	35%		
<b>Option 1:</b> Deviate pipeline around the footprint of the ADF complex	3	2	1	3	2	2.35	<b>1</b>
<b>Option 2:</b> Leave the pipeline in place and protect it by constructing a culvert over it	1	1	2	3	1	1.30	<b>4</b>
<b>Option 3:</b> Leave the pipeline in place and split the ADF such that its toe is outside the servitude of the pipeline	1	3	3	1	3	2.10	<b>3</b>
<b>Option 4:</b> Leave the pipeline in place and stop the ADF to the east of the pipeline such that its toe is outside the servitude of the pipeline	1	3	3	3	3	2.30	<b>2</b>

The weighted scores were determined for each option and ranked accordingly. **Option 1**, deviation of pipeline, was considered the most feasible option.

## **RECOMMENDATION**

Concept designs should ensue on Option 1 and will be included in the Conceptual Engineering Report. Zitholele and Eskom have engaged with Transnet with respect to this option.. However, no further work should be done on this option now. The servitude of the pipeline will only be reached 19 years after the first ash is disposed onto the footprint. This will be approximately in the year 2043. The status of the pipeline or power station may change over this period. It is recommended that the situation be reassessed 5 years prior to reaching the aforementioned servitude.

Yours faithfully



Mr N Rajasakran PrEng  
**ZITHOLELE CONSULTING (PTY) LTD**

### Attachments :

12935/03-09 P00  
12935/03-10 P00  
12935/03-11 P00  
12935/03-12 P00

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