

	<b>Strategy</b>	<b>Engineering</b>
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Strategy for the desilting of slurry  
dam**

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## 1. INTRODUCTION

The storage capacity of the Slurry Dams (Pollution Control Dams) is compromised by sludge accumulation, which prohibits the dams to operate at a level that promotes its function, particularly during the rainy season,

The table below shows the slurry dam that needs to be cleaned in order to increase the storage capacity of the dams by means of desilting.

Pollution Control Dam	Dam Volume (m <sup>3</sup> )	Estimate Sludge Accumulation (%)	Estimate Volume of sludge to be removed (m <sup>3</sup> )
1. Seven Year Dam	18 588	50	9 294
2. Seepage Dam	8910	45	4 010
3. New Lower Dam: Small Pond	32 000	40	12 800
4. New Lower Dam: Large Pond	45 500	40	18 200
5. Old Lower Dams	8 700	30	2 610
6. Upper Dam North	21000	30	6 300
7. Upper Dam Centre	18000	30	5400
8. Upper Dam South	21000	30	6300

### Seven Year Dam

The Seven Year Dam is an unlined earth dam, which collects run-off water from the eastern side of the power station and from the coal stockpile. The Seven Year dam has a maximum storage capacity of 18 588 m<sup>3</sup> and a maximum dam wall height of 3.6 m, with a concrete lined spillway section measuring approximately 2 m long by 300 mm high.

Runoff from the ash spillages is conveyed from the ash booster pump house to the Seven Year Dam by an earth channel, which connects to a concrete pre-settling channel. Run-off from the coal stockpile is conveyed to the Seven Year Dam via concrete settling weir which connects to a concrete pipeline.

Capacity of the Seven Year Dam is compromised by wet ash slurry content, which is estimated to be 50% of the respective storage capacity.

The objective is to de-silt the Seven Year Dam using Online Cleaning mechanism to restore its capacity and ensure that the Seven Year dam is not susceptible to overflow during the rainy season.

### Seepage Dam

The Seepage Dam is an unlined earth dam, which receives subsurface drainage water from Ash Dam 1. From the Seepage Dam, water is transferred to the Old Lower Dams by gravity flow. Seepage dam has a maximum storage capacity of 8910 m<sup>3</sup>.

Capacity of the Seepage Dam is compromised by wet ash slurry content, which is estimated to be 45% of the storage capacity of the Seepage Dam.

The objective is to de-silt the Seepage Dam using Online Cleaning mechanism to restore its capacity and ensure that the Seepage Dam is not susceptible to overflow during the rainy season.

### New Lower Dams

The New Lower Dams consists of two small unlined earth ponds. The smaller pond has a wall height 1.45 m and a maximum storage capacity of 32 000 m<sup>3</sup>, while the larger pond has a wall height of 2 m and a maximum storage capacity of 45 500 m<sup>3</sup>.

Capacity of the New Lower Dams is compromised by wet ash slurry content, which is estimated to be 40% of the respective storage capacity.

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The objective is to de-silt the New Lower Dams using Offline Cleaning mechanism in order to restore its capacity and ensure that the New Lower Dams are not susceptible to overflow during the rainy season.

### Old Lower Dams

The Old Lower Dams consists of two unlined earth ponds with a combined total storage capacity of 8 700 m<sup>3</sup>. The smaller pond has a maximum wall height of 1.13 m while the larger pond is approximately 1.77 m high. The Old Lower Dams receives inflow from the Ash dam through concrete inlet pipes.

Capacity of the Old Lower Dams is compromised by wet ash slurry content, which is estimated to be 30% of the storage capacity.

The objective is to de-silt the Old Lower Dams using Offline Cleaning method to restore its capacity and ensure that the Old Lower Dams are not susceptible to overflow during the rainy season.

### Upper Dams

The Upper Dams consists of three unlined earth ponds with a combined total storage capacity of 53 375 m<sup>3</sup>

Capacity of the Upper Dams is compromised by wet ash slurry content, which is estimated to be 30% of the storage capacity.

## 1.1 SCOPE

### De-silting the Slurry Dams

#### Seven Year Dam

- *Contractor* provides surface preparation to de-silt the Seven Year Dam.
- *Employer* provides no isolations for the whole duration of conducting the de-silting works. *Contractor* de-silts the Seven Year Dam using Online Cleaning mechanism.
- *Contractor* disposes the sludge to Ash Dam 3. Maximum hauling distance from the Seven Year Dam to Ash Dam 3 is 4.5km.
- *Contractor* cleans and rehabilitates the site after completion of conducting the required works.

#### Seepage Dam

- *Contractor* provides surface preparation to de-silt the Seepage Dam.
- *Employer* provides no isolations for the whole duration of conducting the de-silting works. *Contractor* de-silts the Seepage Dam using Online Cleaning mechanism.
- *Contractor* disposes the sludge to Ash Dam 3. Maximum pumping distance from the Seepage Dam to Ash Dam 3 is 2 km and the respective maximum haul distance is 1.5 km.
- *Contractor* cleans and rehabilitates the site after completion of conducting the required works.

#### New Lower Dams

- *Contractor* provides surface preparation to de-silt the New Lower Dams.
- *Employer* provides isolations for the whole duration of conducting the de-silting works. Inflow is restricted and water level is reduced to 30% by pumping the water to the old lower dams *Employer* provides 400mm HDPE pipeline for the *Contractor* to further reduce the water level to 0%, by pumping the water to Ash Dam 5. Maximum pumping distance from the New Lower Dams to Ash Dam 5 is 1.5 km.
- *Contractor* de-silts the New Lower Dams using Offline Cleaning mechanism.
- *Contractor* disposes the sludge to Ash Dam 3. Maximum pumping distance from the New Lower Dams to Ash Dam 3 is 2.5 km and the respective maximum haul distance is 1.5 km.
- *Contractor* flushes the 400mm HDPE pipeline after each shift.
- *Contractor* cleans and rehabilitates the site after completion of conducting the required works.

#### Old Lower Dams

- *Contractor* provides surface preparation to de-silt the Old Lower Dams.
- *Employer* provides isolations in the mornings from 8:00am till 4:00pm. Inflow is restricted and water level is reduced to 30% by pumping the water to the Upper Dams. *Employer* provides 300mm steel pipeline for the

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*Contractor* to further reduce the water level to 0%, by pumping the water to Ash Dam 2. Maximum pumping distance from the Old Lower Dams to Ash Dam 2 is 1.5km

- *Contractor* de-silts the Old Lower Dams using Offline Cleaning mechanism.
- *Contractor* disposes the sludge to Ash Dam 3. Maximum pumping distance from the Old Lower Dams to Ash Dam 3 is 2.5 km and the respective maximum haul distance is 1.8 km.
- *Contractor* flushes the 300mm steel pipeline after each shift.
- *Contractor* cleans and rehabilitates the site after completion of conducting the required works.

#### Upper Dams

- *Contractor* provides surface preparation to de-silt the Upper Dams.
- *Employer* provides isolations for the whole duration of conducting the works to de-silt one pond at a time. Inflow is restricted and the water level is reduced to 40% by pumping the water back to the station. *Employer* provides 300mm steel pipeline for the *Contractor* to further reduce the water level to 0%, by pumping the water to Ash Dam 2. Maximum pumping distance from the Upper Dams to Ash Dam 2 is 1.5 km
- *Contractor* de-silts the Upper Dams using Offline Cleaning mechanism.
- *Contractor* disposes the sludge to Ash Dam 3. Maximum pumping distance from the Upper Dams to Ash Dam 3 is 2.5 km and the respective maximum haul distance is 6.5 km.
- *Contractor* flushes the 300mm steel pipeline after each shift

#### **Contractor cleans and rehabilitates the site after completion of conducting the de-silting works**

##### 1.1.1 Purpose

The purpose of this tender technical evaluation strategy is to define the technical requirements to be met by a contractor/supplier of the services for technical evaluation purposes.

##### 1.1.2 Applicability

This document is applicable to Hendrina Power Station slurry dams.

#### 1.2 NORMATIVE/INFORMATIVE REFERENCES

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

##### 1.2.1 Normative

- [1] 240-168966153 Tender Technical Evaluation Procedure
- [2] 32-1034 Eskom Procurement and Supply Chain Management Procedure

##### 1.2.2 Informative

- [1] Eskom Hendrina power station operating manual.

#### 1.3 DEFINITIONS

Definition	Description
De-silt	Mechanism to clean a dam by removing suspended or settling solids.
Flushing test	The use of water to clean a pipeline by removing dirt, debris or loose foreign materials
Offline Cleaning	Mechanism to de-silt the dam, based on the isolations provided by the <i>Employer</i> .

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Online Cleaning	Mechanism to de-silt a dam while it is live in operation, with no isolations being provided.
Occupational Health and Safety	Measures adhering compliance with Occupational Health and Safety Act (Act 85 of 1993) and its regulations and with the Employers Health and Safety Specification
Environmental Management	Measures adhering compliance with Environmental Management Plan
KPI	Measurement of the project deliverables
Rehabilitate	Restoring a site back to its original state after completing applicable construction and/or maintenance task, and decommissioning activities.
Shift	Daily period of conducting the de-silting works)
Slurry Dams	Pollution Control Dams at Hendrina Power Station. These consist of the Seven Year dam, Seepage Dam, New Lower Dams, Old Lower Dams, and Upper Dams.
Surface preparation	Application of providing site readiness to conduct the required works.

### 1.3.1 Classification

**Controlled Disclosure:** Controlled Disclosure to external parties (either enforced by law, or discretionary).

### 1.4 ABBREVIATIONS

Abbreviation	Meaning given to the abbreviation
KPI	Key Performance Index
N/A	Not Applicable
QIP	Quality Inspection Plan
QCP	Quality Control Plan
SHERQ	Safety, Health, Environmental, Risk and Quality

### 1.5 ROLES AND RESPONSIBILITIES

As per 32-1034 Eskom Procurement and Supply Chain Management Procedure

### 1.6 PROCESS FOR MONITORING

N/A

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**1.7 RELATED/SUPPORTING DOCUMENTS**

Cleaning of AWR and Pollution Control Dams NEC

**2. TENDER TECHNICAL EVALUATION STRATEGY****2.1 TECHNICAL EVALUATION THRESHOLD**

The minimum weighted final score (threshold) required for a tender to be considered from a technical perspective is 70%.

**2.2 TET MEMBERS****Table 1: TET Members**

<b>TET number</b>	<b>TET Member Name</b>	<b>Designation</b>
TET 1		
TET 2		
TET 3		

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**2.3 TECHNICAL EVALUATION CRITERIA****2.3.1 MANDATORY TECHNICAL EVALUATION CRITERIA**

No.	Mandatory Technical Criteria Description	Reference to Technical Specification/Tender Returnable
1.	The tenderer must provide proof of CIDB Grade Level 7 CE	Tenderer must submit a valid CIDB Grade Level 7 CE.
2.	Proof of company ISO 14001:2015 Environmental Management Systems Accreditation	Proof of company ISO 14001:2015 Environmental Management Systems Accreditation.
3.	Proof of company's permission to transport hazardous waste material.	Tenderer must submit a valid hazmat permit.

## 2.3.2 QUALITITATIVE TECHNICAL EVALUATION CRITERIA

Technical Evaluation Criteria	
All documents mentioned in the list are compulsory and must be submitted	Points
<b>Technical Knowledge:</b> Base requirements	65
<p>Provide CV of technical skills (Human resources) demonstrating to be equipped with a minimum of 5 years Dam Cleaning experience</p> <p><u>Site manager-5 points</u></p> <ul style="list-style-type: none"> <li>*Experience greater or equal to five (5) years = 5</li> <li>*Experience less than three (5) years but greater than two (2) years = 4</li> <li>*Experience less than two (2) years but greater than one (1) year = 2</li> <li>*Experience less than one (1) year and/or no experience = 0</li> </ul> <p><u>Operators- 5 points</u></p> <ul style="list-style-type: none"> <li>*More than two (2) Operators = 5</li> <li>*Two (2) operators = 4</li> <li>*One (1) Operator = 2</li> <li>*No Operator = 0</li> </ul> <p><u>Safety officer- 5 points</u></p> <ul style="list-style-type: none"> <li>*Experience greater or equal to three (3) years = 5</li> <li>*Experience less than three (3) years but greater than two (2) years = 4</li> <li>*Experience less than two (2) years but greater than one (1) year = 2</li> <li>*Experience less than one (1) year and/or no experience = 0</li> </ul> <p>Submission to include competency certificate aligning with the applicable dam cleaning mechanism.</p>	15

Provide detailed methodology and applicable machinery/equipment to execute the cleaning of slurry Dams.

Detailed methodology to specify surface preparation activities, mechanism to agitate the sludge and de-silt the slurry Dams as per the applicable site conditions and isolations provided by the *Employer* and relevant waste disposal requirements.

Specification to include production rate broken down according to the use of equipment and effective rate at which each dam will be desilted, and sludge will be disposed to Ash Dam.

\*Complete Methodology with referrals to equipment = 35

\*Methodology without referrals to equipment = 25

\*Methodology provided as per scope of work = 10

\*No Methodology provided = 0

35

Provide pdf Gantt chart illustrating a detailed programme to execute the required works for the within the specified project duration. Programme to summarize the major work activities, estimated durations, and relationships to the other activities of the project. This includes providing a strategy identifying how quickly labour, machinery and equipment to execute the required services can arrive and be secured on site.

\*Gantt chart with clear with clear description of activities and strategy for bringing resources to site = 15

\*Gantt chart with clear with clear description of activities = 10

\*Gantt chart only = 5

\*No submittal of Gantt chart = 0

15

**Availability of facilities:** Contractor must have sufficient tools to perform the project

25

<p>Provide a letter counter signed by the Contractor's line of authority for authenticity and quality verification specifying the list of equipment/machinery proposed to be used to conduct the de-silting works on the slurry Dams ,as per the site conditions and isolations provided by the Employer in the Works Information</p> <p>*Submitted signed letter = 15            *Submitted unsigned letter = 10            *No letter submitted = 0</p>	15
<p>Provide a letter counter signed by the Contractor's line of authority for authenticity and quality verification specifying the list of equipment/machinery proposed to be used to dispose sludge as per the scope issued by the <i>Employer</i>    *Submitted signed letter = 10            *Submitted unsigned letter = 5            *No letter submitted = 0</p>	10
<b>Completed contracts of similar nature:</b>	<b>10</b>
<p>Previous completed contracts, with referrals of providing services to conduct Offline Dam Cleaning, and disposing sludge using appropriate mechanisms.</p> <p>*Submittal of two letters of referral = 10            *Submittal of one letters of referral = 5            *Non submittal of letter = 0</p>	10
<b>Minimum qualifying weighted average score</b>	<b>70</b>
<b>Total scores for tenders</b>	<b>100</b>
<b>Technically Acceptable Yes/No</b>	

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**2.4 TET MEMBER RESPONSIBILITIES****Table 2: TET Member Responsibilities**

Qualitative Criteria Number	TET 1	TET 2	TET 3	TET 4	TET 5	TET 6
Technical skills	X	X	X			
Completed similar Projects	X	X	X			
Detailed methodology	X	X	X			
Detailed programme/ ghannt chart	X	X	X			
List of equipment	X	X	X			

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**2.5 FORESEEN ACCEPTABLE / UNACCEPTABLE QUALIFICATIONS****2.5.1 Risks****Table 3: Acceptable Technical Risks**

<b>Risk</b>	<b>Description</b>
1.	None

**Table 4: Unacceptable Technical Risks**

<b>Risk</b>	<b>Description</b>
1.	None

**2.5.2 Exceptions / Conditions****Table 5: Acceptable Technical Exceptions / Conditions**

<b>Risk</b>	<b>Description</b>
1.	None

**Table 6: Unacceptable Technical Exceptions / Conditions**

<b>Risk</b>	<b>Description</b>
1.	None

### **3. AUTHORISATION**

This document has been seen and accepted by:

### **4. REVISIONS**

<b>Date</b>	<b>Rev.</b>	<b>Remarks</b>
2022-02-02	0	Document for review.
2023-06-15	1	Add mandatory requirements.

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