

	<b>Specifications</b>	<b>Medupi Power Station</b>
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Title: **Medupi Power Station Scope of work for Hydrated Lime**

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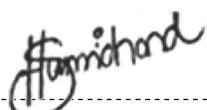
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## **1. Introduction**

A layer of lime hydrate protects the bags from chemical attacks (acid attacks) and prevents plugging due to cracking of sticky particulates contained in the flue gas of the combustion process. It has been proven that pre-coating has a favourable effect on the service life of the bags.

Lime coating is necessary if the unit has been off for 2 or more days.

A silo truck with on-board compressor is connected to a coating line. Permission to coat will be given after plant conditions for pre-coating have been met. Pre-coating is achieved when the predetermined quantity of hydrated lime is injected to filter bags at a pressure of up to 2.5 bar.

## **2. Supporting Clauses**

### **2.1 Scope**

The user requirements specification for Bulk Hydrated Lime involves among other things, the chemical requirements concerning impurity limitations on Hydrated Lime that will be used during PJFF pre-coating for a period of three (3) years on an “as and when” required basis.

#### **2.1.1 Purpose**

The purpose of this document is to outline the requirements and specifications of the Hydrated Lime needed for PJFF coating.

#### **2.1.2 Applicability**

This document is applicable to Medupi Power Station.

#### **2.1.3 Effective date**

The effective date of the document is the authorisation date.

### **2.2 Normative/Informative References**

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

#### **2.2.1 Normative**

- [1] ISO 9001 Quality Management Systems
- [2] Eskom Procurement and Supply Chain Management Policy
- [3] Eskom Procurement and Supply Chain Management Procedure

#### **2.2.2 Informative**

- [4] 240-53113965 Fabric Filter Plant Bag Standard

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### 2.3 Definitions

Definition	Explanation
Contractor	Service provider contracted for supplying specific service to Eskom, Medupi Power Station.
Employer	Eskom, or Eskom Medupi Power Station.

### 2.4 Abbreviations

Abbreviation	Explanation
Al <sub>2</sub> O <sub>3</sub>	Aluminium oxide
C&I	Control and instrumentation
Ca(OH) <sub>2</sub>	Calcium Hydroxide
CaCO <sub>3</sub>	Calcium Carbonate
CaSO <sub>4</sub>	Calcium Sulphate
CO <sub>2</sub>	Carbon dioxide
COA	Certificate of analysis
Fe <sub>2</sub> O <sub>3</sub>	Iron Oxide
ISO	International standard organisation
MgO	Magnesium Oxide
Mn <sub>2</sub> O <sub>3</sub>	Manganese Oxide
MSDS	Material Safety Data Sheet
NEC	New Engineering Contract
PJFF	Pulse Jet Fabric Filter
PO	Purchase Order
Ppm	Parts per million
SAP	System Application and Products
SiO <sub>2</sub>	Silica Oxide
SO <sub>3</sub>	Sulphur trioxide

### 2.5 Roles and Responsibilities

System Engineer	Specify system requirements
C&I Engineer	Verifying C&I requirements
OPS personnel	Perform pre-coating activity

### 2.6 Process for Monitoring

N/A

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## **2.7 Related/Supporting Documents**

None

## **3. User Requirements**

### **3.1 Adherence to Eskom generic policies**

- a) All Contractor employees shall comply with Eskom's policies and site regulations, including but not limited to, use of cell phones in restricted areas, adherence to Eskom's cardinal rules, no smoking policy, zero tolerance on alcohol usage, etc. These requirements will be detailed during the induction training process.
- b) The contractor shall comply with Eskom policies and regulation, including confidentiality agreement.
- c) The contractor shall comply with NEC contract signed.

### **3.2 Quality**

- a) The Contractor provides a complete Quality Assurance plan in accordance with the requirements of ISO 9001 2008 to Eskom for approval. This plan must ensure an integrated quality service as part of the contract. Execution of all quality related activities, including inspection and test plans compilation and execution, stores material quality inspections and all quality-related record keeping is part of the Contractor's scope of work.

### **3.3 Scope of Work**

#### **3.3.1 Delivery Requirements**

- a) The contractor shall supply and deliver Hydrated Lime to the premises timely as per the request and must make emergency deliveries within 24 hours after the official order has been made.
- b) Proper performance shall require delivery personnel's constant inspection and observation of unloading operations and knowledgeable response to problems or emergencies.
- c) Eskom reserves the right to refuse all deliveries made with equipment that is poorly maintained and/or leaking.
  - i.) Delivery of all Hydrated Lime shall be as per the Eskom's request only
  - ii.) The supplier as well as the Eskom employee shall ensure that the product delivered is within the agreed specifications.
  - iii.) Supplier to issue all the necessary operating manual(s) as well as handling procedures to Eskom.
  - iv.) The Contractor shall furnish a Purchaser approved, leak-free connection device between the trailer and the Purchaser's intake receptacle. The Contractor shall

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observe the entire filling operation at each delivery site and shall immediately report any spills caused during the pre-coating operations

### **3.3.2 Delivery Locations**

Delivery shall be made to:

Medupi Power Station

Steenbokpan road

Lephalale

0557

### **3.3.3 Quantity and Payments**

Eskom Medupi Power Station Generation division will use the weight bridge on-site to weigh the tanker before and after the deliveries in the presence of the driver. The quantity reflecting on the supplier's weigh bridge slip will be used for payment purpose provided the percentage difference between the supplier and Eskom's weight is 3% or less. Should the difference be above 3% a dispute arises where Eskom and supplier agrees on the quantity to be considered.

### **3.3.4 Limestone quality and traceability prior to offloading**

For quality control and traceability, the supplier shall supply a chemical together with their MSDS and COA corresponding to the specific batch number of a chemical.

If the chemical received does not meet the specifications though accepted and indicate compliance in COA, Eskom shall return the product back to the supplier to exchange and get a new batch.

### **3.3.5 Orders and Purchases**

- a) Deliveries will be done after an official order is sent to the supplier, indicating quantities required.
- b) The Eskom employee shall sign on the chemical received form in Annexure A and file the necessary documents.
- c) Expected offloading time from the time the tanker reaches the station is 2 hours, however Eskom might experience plant challenges which may lead to delays for offloading the tankers.

### **3.3.6 Tanker Contamination**

- a) The tankers shall be clean and free of residue that may contaminate the Contractor's product or impede the unloading process. It is the Contractor's responsibility to verify the cleanliness of the transporting equipment before loading. All valves, pumps, and discharge hoses used for the delivery of Hydrated Lime shall be supplied by the Contractor and shall be clean and free from contaminating material. The Purchaser may reject a load if the equipment is not properly cleaned.
- b) The Contractor shall take immediate and appropriate actions to clean up any spilled Hydrated Lime and if the spill is not cleaned up, the Purchaser will hire a certified hazardous material handling company to clean up the spill, and the cost of such service will be charged to the Contractor and deducted from the amount due to the Contractor. If

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the Purchaser's unloading equipment such as pipe, valves or level indication and alarms should fail and the spillage is not the fault of the Contractor or its subcontractor, the Contractor shall be relieved of clean-up of the spill.

### 3.4 Documentation

The contract shall be authorised and signed by responsible people between the supplier/contractor and Eskom.

### 3.5 Hydrated lime Specifications

#### 3.5.1 Hydrated Lime

<b>Hydrated Lime Specifications: Chemical Properties</b>	<b>Average (%)</b>	<b>Min. (%)</b>	<b>Max. (%)</b>
Free Calcium Oxide (CaO)	0.16	-	1.00
Magnesium Oxide (MgO)	1.01	-	1.20
Silica	0.50	-	0.98
Ferric Oxide (Fe <sub>2</sub> O <sub>3</sub> )	0.15	-	0.60
Alumina (Al <sub>2</sub> O <sub>3</sub> )	0.08	-	0.35
Calcium Hydroxide (CaOH <sub>2</sub> )	94.8	90.0	-
Carbon Dioxide (CO <sub>2</sub> )	0.60	-	1.5
Free Moisture (H <sub>2</sub> O)	0.64	0	2.00
Colour / Texture	Light Brown / Fine Powder		

#### High Calcium Hydrated Lime Particle Size:

<b>Size Parameter</b>	<b>Typical %</b>
< 850 micron	100
< 300 micron	99.5
< 100 micron	99.0
< 75 micron	85

#### 3.5.3 Silo Truck

2 lime truck of 17 Tons or 1 lime truck with 32 tons capacity each equipped with on-board compressor. connecting a quick coupler DN10

#### 3.5.3 Lime Bulk Bags

Delivery of 1200 kg bulk bags with handles for onsite lime conveying

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### **3.6 Safety**

#### **3.6.1 Health and safety regulations**

All Contractors shall comply with the Medupi Health and Safety Policy, some of the key requirements of which are attached as Annexure B.

#### **3.6.2 Task Risk Assessments**

It must be conducted jointly by the Employer and Contractor.

#### **3.6.3 First Aid Centre**

Medical, ambulance and first aid facilities are provided on site by the Eskom. Medupi emergency number **(086 123 7566)**

### **3.7 Technical Requirements**

- a) The Supplier shall inspect each off-loading facility prior to the first delivery of the chemical in order to confirm tanker access to the off-loading facility and to confirm compatibility with power station connections, including, but not limited to, chemical off-loading and air supply couplings and flange sizes.
- b) Eskom shall inform the Supplier of any modification to the off-loading facility. Where necessary, the Supplier shall inspect the off-loading facility to assess the impact of the modification and to ensure compatibility.
- c) The Supplier shall not use a calf for the delivery of the chemical.
- d) The tanker shall be equipped with off-loading equipment and delivery pipes fitted with the correct couplings and seals. A spare set shall be available with every tanker.
- e) Equipment shall be capable to deliver to a height of 30 meters.
- f) The tanker must have an off-loading pipe to reach a distance of approximately 15 meters.
- g) Every tanker shall be in possession of the following documentation:
  - (i) Material Safety Data Sheet
  - (ii) Product Specification
- h) The Supplier shall arrange for safety induction of all individuals delivering chemicals to power stations.
- i) The Supplier shall ensure that bulk chemical deliveries are made by personnel trained in safety precautions specific for handling the delivered chemical, and that delivery personnel abide by Supplier and the Eskom safety procedures, including the use of required personnel protective equipment.
- j) The Supplier shall communicate with the power station to arrange weekly delivery schedule.
- k) Deliveries shall only be accepted during the following working hours during the week, namely between 08:00 to 15:00, except for Fridays where deliveries shall only be accepted up to 10:00. During emergency situations, after hour deliveries can be accommodated with prior arrangement with the power station.
- l) Eskom shall inform the Supplier in cases where a split delivery is planned. The anticipated off-loading time for a single point of delivery is 3 hours. Eskom shall record the time that documents are delivered to the Water Treatment Plant Control Room.
- m) The Supplier shall report to the Water Treatment Plant Control Room on arrival, with all documentation required.

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- n) The following documentation shall be shown to the Eskom personnel in the Water Treatment Plant Control Room upon arrival at the power station:
  - (i) Competency declaration for the person responsible for off-loading and sampling of bulk chemical being delivered
  - (ii) Tanker Inspection Form, confirming:
    - a. Vehicle road worthiness
    - b. Functionality of air/pump off-loading system
    - c. Condition of flexible pipes and connections (cleanliness and wear)
    - d. Date of off-loading pipe pressure test
    - e. Tanker content cleanliness
- o) The following documentation shall be submitted to the Eskom personnel in the Water Treatment Plant Control Room upon arrival at the power station:
  - (iii) Weigh bridge certificate
  - (iv) Certificate of Analysis showing that that the chemical in the tanker meets the specification.
  - (v) Delivery note, which must include the Eskom order number, the name of the power station and the power station address
- p) The Supplier shall be accompanied to the off-loading facility by the Eskom personnel.
- q) The Supplier shall take a sample from the tanker for analysis by the Eskom personnel.
- r) Connection to the off-loading facility shall only commence after the Eskom personnel has confirmed the quality of the chemical and has given permission for off-loading to proceed.
- s) A tanker shall be rejected in the event of product quality non-conformance or safety non-conformance. The Contract Manager shall be informed immediately and no payment shall be made.
- t) The Supplier shall be responsible for connecting the tanker to the off-loading facility.
- u) Where an intermediate transfer pump is required, the tanker shall be fitted with stainless steel pump.
- v) Standing time shall only be claimed if the delay is caused by Eskom. Standing time shall not be claimed where external conditions affect off-loading, such as rain, hail, lighting, etc.

### **3.8 Communication and correspondence**

- a) The Contractor shall communicate with the contract supervisor and the buyer if there are any changes on the orders or product. The communication shall be professionally via e mail.
- b) The correspondence shall include the following:
  - i.) Medupi Power Station
  - ii.) Eskom's contract number
  - iii.) Contract description
  - iv.) Correspondence subject matter
  - v.) Contractors contract details

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- vi.) Date
- vii.) Signatures of responsible people.

### **3.9 Tender Requirements**

- a) The contractor shall supply a price list and tender documents.
- b) Medupi Power Station shall evaluate the tender according to Eskom policy on the issuing of the contract and the contract shall be discussed.

### **3.10 Common site services and conditions**

#### **3.10.1 Roads and Vehicles**

- a) All traffic is limited to using existing roads.
- b) All road signs and traffic laws / regulations on site will be adhered to.
- c) Damage caused to underground services, structures, etc., because of the Contractor not using the prescribed routes will be recovered from the Contractor.
- d) All Contractors shall comply with Eskom Vehicle and Driver Procedure 32 – 93 and Construction Site Vehicles requirements.

#### **3.10.2 Security**

##### **a) Site access and departure**

All vehicles and persons entering or leaving site will be subjected to Security checks and or search. This includes but is not limited to briefcases and toolboxes. Personal tools need to be listed and acknowledged by Security when brought on site. This list will be used for verification when the tools are removed from site.

### **3.11 Eskom Safety Principles**

- a) No operating condition, or urgency of service, can justify endangering the life of anyone or cause injury.
- b) Conduct business with respect and care for people and the environment and, ensure that adequate resources are available for SHE management
- c) Entrench the belief that all injuries are preventable.
- d) All employees and Contractors are responsible for their own and that of their colleague's safety.
- e) The Contractor commits to employ only people who have been duly authorized in terms thereof and who have received sufficient training to ensure that they can comply therewith.
- f) No extension of time will be allowed because of any action taken by the Employer in terms of the above and the Contractor shall have no claim against the Employer as a result thereof.

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Furthermore, no amendments to the Act or Regulations or reasonable amendment to Eskom's Safety and Operating procedures will entitle the Contractor to claim any additional costs incurred in complying the therewith from Eskom.

#### **4. Acceptance**

<b>Full Name and Surname</b>	<b>Designation</b>
Benji Rahlogo	Chief Technologist Engineer
Deon Barnard	Manager Operating Shift
Ennie Manganye	(Manager Operating Shift)
Goodwill Baloyi	Manager Operating Shift
Lesetsa Maropola	Senior Advisor Engineering
Malose Langa	Senior Technologist Engineer
Moses Nonyane	Manager Contract Management
Mpho Selai	Manager Commissioning
Pontsho Letsholonyane	Manager Contract Management
Rabelani Makananise	Production Manager
Stephina Kubyana	Manager Operating Shift
Thabang Thango	Production Manager
Thapelo Mdlakaze	Senior Supervisor Technical Operating
Tlangelani Mathebula	Manager Contract Management

#### **5. Revisions**

<b>Date</b>	<b>Rev.</b>	<b>Compiler</b>	<b>Remarks</b>
September 2024	2	ME Molefe	2 <sup>nd</sup> Revision
September 2020	1	ML Manamela	New Document

#### **6. Development Team**

The following people were involved in the development of this document:

- Benji Rahlogo

#### **7. Acknowledgements( if applicable )**

None

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## Appendix A – Chemical Composition

### LIME SCOPE DESCRIPTION

<b>CALCIUM HYDRATED LIME</b>		
<b>Chemical Formula</b>	Ca(OH) <sub>2</sub>	
<b>Alternative</b>	Slaked Lime, Calcium Hydroxide, Hydrated	
<b>Typical chemical analysis</b>	<b>Typical%</b>	
	Available calcium as CaO	69,0
	Total calcium as CaO	72.0
	Total magnesium MgO	1.2
	Manganese as Mn <sub>2</sub> O <sub>3</sub>	1.0
	Iron as Fe <sub>2</sub> O <sub>3</sub>	0.5
	Aluminium as Al <sub>2</sub> O <sub>3</sub>	0.3
	Silica as SiO <sub>2</sub>	0.8
	Carbon dioxide	1.0
	Combined moisture	23.0
	Free moisture	0.3
<b>Physical properties</b>	<b>Aerated</b>	<b>De-aerated</b>
Bulk density (kg/m <sup>3</sup> )	450	600
	Air separated to produce the following size analysis	
Size:	<b>Screen Aperture (µm)</b>	<b>% Retained (Typical)</b>
	850	0.0
	250	0.5
	150	5.0
	75	15.0
Minus	75	79.5
Colour : Buff due to the presence of Manganese as Mn <sub>2</sub> O <sub>3</sub>		
Angle of repose : Very fluid in the aerated state (0°-5°)		
Handling	Moisture free air is essential for bulk unloading	
Storage	Keep under cover	
Safety	Hydrated Lime is strongly alkaline having a saturation pH of 12.4 in an aqueous solution. Refer to the Lime Safety and Handling Guide.	
The tanker should have a serviceable offloading compressor		

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**APPENDIX A2**

ITEM	DESCRIPTION	UNIT OF MEASURE	QTY	CONTRACT DURATION IN YEARS	RATE	AMOUNT
					R	R
1	Calcium Hydrated Lime	tons		3		
2	Transportation to Medupi Power Station	per ton		3		
3	Standing time	per hour		3		

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