

Eskom	Grootvlei Power Station Scope of Work for Supply and Delivery of Coagulant and Flocculent for a period of 60 months		
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Unit	Vaal dam & Water treatment Plant	Plant area	Pre-Treatment
Responsible Department	Chemical Services		

Background: Grootvlei Power Station receives its raw water source from the Vaal dam. This water is treated through coagulation, flocculation, clarification, and sand filtration before being fed to the ion exchange vessels. The purpose is to produce demineralised water as per Eskom Standard 240-53113712 suitable for used on steam boiler for power generation.

Objective: The Supply and Delivery of Coagulant and Flocculent for a period of 60 months at Grootvlei Power Station.

Scope

Required works.

The Supplier is required to supply and delivery Pre-treatment Chemicals Flocculent & Coagulant for a period of 60 months at Grootvlei Power Station.

Full Plant Specifications

Vaal Dam Flocculent dosing

Grootvlei has a plant at the Vaal marine that is approximately 60km from the station were raw water is pre-treated by poly dosing for turbidity removal before it is pumped to the station via terminal reservoirs.
The plant is equipped with 2 x 10 tons chemical storage tanks with a suitable offloading space for a truck. The chemical must be pumped to the storage tanks thus a suitable long discharge pipe approximately 5 metres long will be adequate for chemical transfer.

The turbidity of untreated raw water ranges between 70 NTU to 140 NTU and when the dam level is extremely low it can reach 250 NTU and above with the Alkalinity between 60 ppm to 100 ppm or greater.

The turbidity after the clarifiers is expected to be reduced to less than 20 NTU.TOC Removal of at least greater than 20%

The chemical must high in viscosity due to the setup of the dosing system, to avoid high flow dosing by gravity.

Grootvlei Water Treatment Plant (Coagulant and Flocculent) dosing

Raw water to station expected at the turbidity less than 20 NTU is introduced at the water treatment Plant at a flow rate between 100 m³/hr to 300 m³/hr. The system has two dosing points, the coagulation dosing (preferably Inorganic with aluminium metal) and flocculation (high molecular weight polymer at a limit of 1 ppm dosing concentration). The dosing points are 8m apart agitated, mixed and allowed to settle at the flocculation tank and clarifiers.

No additives for alkalinity and pH control prior to chemical dosing, raw alkalinity between 60 ppm and 100 ppm and pH between 7.2 and 8.5.

The turbidity outlet on the clarifiers must be less than 2NTU and the percentage Total Organic carbons removal of more than 45% as per Eskom standard 240 – 53113712. The enhanced dosage is preferred for Natural Organic Matter removal.

The plant treat water to produce potable water that is used by the community around the station and the employees at the station, the water must meet the aesthetic, chemical, microbiological, and physical quality acceptable levels as per the SANS 241 requirement and the chemicals must be NSF approved/certified. We also use pre-treated water to produce demineralised water using cation and anion exchange resins therefore the metal concentration on the coagulant must be low.

The plant has 1x 10 tons coagulation chemical storage tank, the tank is located 25 m from where the truck can be able to park for offloading.

The required works includes the following.

Provision of Service

- The contract will be for the duration of three years (60 months),
- Chemical Supply and delivery of Coagulant as and when required, supplied in 10 000L for the station Water Treatment Plant
- Chemical Supply and delivery of Flocculent as and when required, supplied in 10 000L for the Vaal Dam Pre-treatment Plant
- Chemical supply and delivery of Flocculent as and when required, supplied in 1000L Flow bins for the Station Water Treatment Plant

The following targets are strived for in terms of pre-treatment performance for the removal of organic matter after clarification and sand filtration by Grootvlei Power Station:

- Clarification outlet turbidity < 2 NTU
- Sand filtration outlet turbidity <0.2 NTU
- TOC (measured as C) at the outlet of the clarifier: >40% (but as high as reasonably achievable) with respect to raw water TOC.
- UV₂₅₄ reduction (measured as the absorbance): 75 – 85 % with respect to raw water absorbance.

- Particulate organic removal (determined by the difference between total organic carbon measurement and dissolved organic carbon measurement) : >90 % with respect to raw water concentration.

Supplier to take note of the following:

- The supplier shall provide a 16 points Safety Data Sheet with a South African contact number for each chemical upon delivery.
- The suppliers provide COA including but not limited to Colour, pH and SG.
- All chemical containers shall have an identifying label that includes as a minimum the substance name, shelf life or expiry date, appropriate hazard warnings and identification of manufacturer or distributor.

Additional information to be noted by the Supplier.

1. All the chemicals must be SABS or NSF approved/certified.
2. Goods to be tested and inspected before delivery.
3. Packing - The chemical is to be contained in plastic container. Transport – Supplier/Contractor will transport the chemical from their factory to the Water Treatment Plant or Vaal Dam wherever the chemical is needed for use. Offloading – The supplier will connect the pump to the offloading hose and pump the chemical to the storage tanks as safely as possible (The offloading hose and pumps are to be provided by the supplier).
4. All chemical to be packed and transported according to manufacturer's requirements.
5. The Supplier to provide storage and preservation requirements for each chemical supplied at Grootvlei Power Station
6. Ensure compliance with legislation and national standards.
7. Ensure compliance with Eskom policies and procedures.

The Supplier must provide a method statement clearly indicating how the work will be executed, considering the minimum requirements contained in this document. This must also include samples of all documents that will be used. The Supplier must also provide full details of his quality management plan and safety management plan.

Total Quantities of the chemicals

1. Coagulant Water treatment plant – 280 000L
2. Flocculent water treatment plant – 60 000L
3. Flocculent Vaal dam – 280 000L

Designation	Compiled by	Reviewed by	Approved by	Accepted by
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Date	11/09/2024	11/09/2024	11/09/2024	12/09/2024