

	SCOPE OF WORK	Grootvlei Power Station
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TITLE: Supply, Delivery and Dosing of Cooling water chemicals at Grootvlei Power Station for a period of 60 months.

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1. INTRODUCTION

Grootvlei Power Station consists of 3 wet cooled units which produce 200MW each at full load, during the process of electricity generation, the station uses cooling water to cool the water from the condensate system. There is a need for microbiological treatment in the cooling water system to eliminate Biofouling in the system pipes that can reduce efficiency, to eliminate corrosion and health risk in terms of Legionella.

2. SUPPORTING CLAUSES

2.1 SCOPE OF WORK

2.2 Purpose

The purpose of this document is to outline the requirements and specifications of the chemicals needed for operation of Grootvlei Power Station Auxiliary Cooling Water Treatment Plants.

2.3 Applicability

This document is applicable to all Grootvlei Power Station Chemistry personnel and all relevant contractors.

3. Normative/Informative References

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

3.1 Normative

None

3.2 Informative

240-55864767 Cooling water standard – Microbiological

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4. Definitions

Definition	Description
Algae	Relatively large organisms generally coloured blue-green or green by the presence of chlorophyll. Algae require sunlight for growth.
Biodispersants	Compounds that will penetrate and detach microbial deposits while preventing re-attachment.
Biocide - Non-Oxidising	Compounds used to kill off micro-organisms affecting cell construction, composition or metabolic pathways. Normally slower acting than oxidising, e.g. Isothiazalone, DBNPA. Effective against planktonic microbes and the top layer of biofilm. Biocide resistance may be developed.
Biocide - Oxidising	Chemicals that literally “burn up” / oxidise any organic compound they come into contact with e.g. chlorine, bromine compounds, peroxide. Effective against planktonic microbes and the top layer of biofilm. No development of
Fouling	The formation of deposits on equipment surfaces, which significantly decrease equipment performance and/or the useful life of the equipment.
Limit	The values representing either an operating range or an absolute “end of the line” condition.
Scale	Scale is a dense coating of predominantly inorganic material formed from the precipitation of water-soluble constituents

4.1 Classification

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

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4.2 Abbreviations

Abbreviations Abbreviation	Description
Alk	Alkalinity
CCPP	Calcium Carbonate Precipitate Potential
CFU	Colony Forming Units
CoC	Cycles of Concentration
DWS	Department of Water and Sanitation
LIMS	Laboratory Information Management System
NTU	Nephelometric Turbidity Units (sometimes designated as FTU or NTU)
PPB	Parts per billion or µg.kg-1.
PPM	Parts per million or mg.kg-1.
PS	Power Station
SANS	South African National Standard
TOC	Total Organic Carbon
TSS	Total Suspended Solids

5. Roles and Responsibilities

It is the responsibility of Chemical Services supervisor to ensure that the chemicals supplied are of the correct specification and quality.

6. Process for Monitoring

Not applicable.

7. Related/Supporting Documents

None

8. Document Content

8.1 Requirements

8.2 Adherence to Eskom generic policies

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 Life Saving rules, no smoking

policy, zero tolerance on alcohol usage, etc. These requirements will be detailed during the induction

training process.

The contractor shall comply with Eskom policies and regulation, including confidentiality agreement.

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The contractor shall comply with NEC contract signed.

8.3 Quality

The Contractor provides a complete Quality Assurance plan in accordance with the requirements of

ISO 9001 2008 to the Employer 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.

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9. Scope of work

The contractor is required to supply, deliver ,dose chemicals ,monitor and optimize the cooling water system microbiological treatment.

The contractor is required to supply the following chemicals.

Material Number	Description	Unit of Measure	Quantity
0669621	INHIBITOR, CORROSION: TYPE: CHEMICAL; PHYSICAL FORM: LIQUID; CONTAINER TYPE: DRUM/FLOW BIN; CONTAINER CAPACITY: 1000 KG/L; COLOR: COLORLESS; SPECIAL FEATURES: ANTISCALENT; APPLICATION: SCALE REMOVAL; STANDARD: ISO 9001; SCALE CONTROL/INHIBITOR FOR ASH SYSTEM, ANTISCALENT TO BE DOSED CONTINUOUSLY TO PREVENT SCALE FORMATION ON COOLING WATER WATER PUMPS	KG	250 000
0763720	CHEMICAL: TYPE: HYPOCHLORITE SOLUTION; FORM: LIQUID; CONTAINER CAPACITY: 1000 KG; CONTAINER: BULK INTERMEDIATE; TRADE NAME: SODIUM HYPOCHLORITE; COMPOSITION: SODIUM HYPOCHLORITE 12.5 PCT; COLOR: YELLOWISH; CAS REGISTRY NUMBER: 7681-52-9; EINECS NUMBER: GHS16 POINT SDS AND LABELING; GRADE: SG 1.2; SPECIFICATION: ISO 9001-2008; SUPPL P/N: 8023; USED TO CONTROL MICRO ORGANISM IN WATER; MUST SUPPLY A GHS APPROVED SDS AND COPY OF GHS COMPLIANT LABEL; PACKING RELATED TO IBC MUST IN A KAYMAK DAUGHTER BIN TO ENSURE SAFE OFF-LOADING; CONTRACTORS ARE REQUIRED TO DELIVER AND OFF-LOAD CHEMILS IN ACCORDANCE TO THE TRANSPORT OF DANGEROUS GOODS ACT OF 1992	KG	420 000
0669623	CHEMICAL: TYPE: CHEMICAL; FORM: LIQUID FORM; CONTAINER CAPACITY: 1000 KG/L; CONTAINER: DRUM PLASTIC; TRADE NAME: ANTISCALENT OR CRYSTAL MODIFIER; COLOR: COLORLESS; SPECIFICATION: ISO 9001; SCALE CONTROL/CRYSTAL MODIFIER TO DOSED CONTINUOUSLY ON COOLING WATER SYSTEM TO PREVENT SCALE BUILD UP IN THE CONDENSORS, THIS CHEMICAL WILL BE DOSED TOGETHER WITH BIOCIDES AND BIODISPERSANT	KG	250 00
0667862	BIOCIDES, WATER ADDITIVE: TYPE: ISOTHIAZOLIN, NON OXIDIZING BIOCIDES; COMPOSITION: CHEMICAL; PHYSICAL FORM: YELLOW, LIQUID; MATERIAL GRADE: C; CONTAINER TYPE: PLASTIC; CONTAINER CAPACITY: 25 L; SHELF LIFE: 6 MONTH; SPECIFICATION: PH (6-9) DENSITY (1.08KG/M3); BIOCIDES ISOTHIAZOLONE IS AN ANTIMICROBIALS USED TO CONTROL BACTERIA, FUNGI, AND ALGAE IN COOLING WATER SYSTEMS, THE CHEMICAL SHOULD BE COMPATIBLE TO THE STAINLESS STEEL TUBES	KG	420 000

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0763654	CHEMICAL: TYPE: ORGANIC BIODISPERSANT; FORM: LIQUID; CONTAINER CAPACITY: 1000 KG; CONTAINER: TANK; SUPPLIER TO DO THE DOSING AND ENSURE THAT THE CHEMICAL IS EFFICIENT; INSPECTIONS AND SUBMIT REPORTS TO ESKOM, MATERIAL SAFETY DATA SHEETS WITH ENVIRONMENTAL INFORMATION IN THE 16 POINT FORMAT TO BE PROVIDED WITH EVERY DELIVERY AS REQUIRED BY THE OCCUPATIONAL HEALTH AND SAFETY ACT, THE CHEMICALS DOSED AND ITS ASSOCIATED DOSAGE RATE MUST ENSURE THAT THE MICROBIOLOGICAL REQUIREMENTS OF THE ESKOM STANDARDS 240-55864767-CHEMISTRY AND MICROBIOLOGY STANDARDS FOR COOLING WATER ARE MET	KG	250 000

Responsibilities of the contractor are as follows,

- The contractor shall be responsible for dosing and optimization of all the chemicals.
- The contractor is required to bring their own pumps and tubing for dosing purposes. ESKOM will not provide any pumps to the contractor. For offloading the contractor will use their own transfer pumps and for continuous dosing the contractor will use their own pumps
- The contractor is required to conduct monthly and quarterly analysis to ensure that the microbiological treatment is effective on the cooling water system and send official report which informs the service manager of the current state.
- For quality control and traceability, the contractor shall supply a chemical together with their SDS and COA corresponding to the specific batch number of a chemical.
- The contractor shall ensure that the chemicals are tested and inspected before delivery.
- Packing - The chemical is to be contained in plastic container. Transport Contractor will transport the chemical from their factory to Grootvlei PS.
- All chemical to packed and transported according to manufacturer's requirements, The contractor shall ensure that no repacking of the chemicals is done.
- The Contractor to provide storage and preservation requirements for each chemical supplied at Grootvlei Power Station.
- Provide a support function whenever issues regarding chemical dosing in the plant occur.
- Ensure compliance with legislation and national standards SANS 241.
- Ensure compliance with Eskom policies and procedures 240 – 53113712.

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9.1 BACTERIOLOGICAL QUALITY ANALYSIS REQUIREMENTS

The contractor conducts analysis as per the table below. The total bacteria results of the treatment efficiency must be recorded in a formal report and sent to the service manager.

NOTE: Where no limit is specified, the requirement is that trends are closely observed to detect deviations from normality.

Bacteriological quality Parameter	Target	Limit	Frequency of analysis
Total aerobic bacteria	<105 CFU/ml	<105 CFU/ml	Monthly
Chlorophyll A	< 25 µg.kg-1	< 25 µg.kg-1	Quarterly
Legionella	<100CFU/L	<10 000 CFU/L	Quarterly
H2S producers	< 50 CFUs/ml	< 50 CFUs/ml	Monthly

10. AUTHORISATION

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Name and surname	Designation
██████████	██████████
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██████████	██████████

11. REVISIONS

Date	Revision	Compiler	Remarks
January 2026	01	██████████ ██████████	New document

12. DEVELOPMENT TEAM

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

- Sabelo Hlatshwayo

13. ACKNOWLEDGEMENTS

Not applicable.

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