

	Specification	Kusile Power Station
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**Title: Kusile Power Station Laboratory
Chemicals and Consumables
Contractor user Requirements**

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1. Introduction

Kusile Power Station intends to partner with an accredited consumable and chemical contractor in order to ensure that reliable test results are obtained and achieved in the laboratory for various plant processes. This document details the scope of work and all the mandatory requirements from any suitable contractor for this project. The quantity of chemicals and consumables are indicated under the scope of work and the duration of the contract is estimated to be effective for a three-year period on an "as and when required" basis.

2. Supporting Clauses

2.1 Scope

This specification covers all forms of chemicals, including but not limited to chemicals that will be used at the Water Treatment Plant (WTP), Units/Cycle chemistry, Flue Gas Desulphurisation (FGD), Wastewater Treatment Plant (WWTP) and Laboratory sections (Oil and Water laboratory) for quality assurance of all the instruments and analysis that will be conducted by the laboratory to support all the processes under Chemical Services department.

2.1.1 Purpose

The purpose of this document is to describe and list the requirements of all chemicals and reagents that need to be supplied to Kusile Power Station laboratory by an accredited contractor.

2.1.2 Applicability

This document shall apply to Kusile Chemical Services department.

2.1.3 Effective date

This document is effective from 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] GPM/0147 User requirement specification guidelines.
- [2] Occupational Health and Safety Act 85 of 1993.
- [3] ISO 9001-2015 Quality Management Systems
- [4] SANS 17025:2017, 2nd edition, General requirements for the competence of testing and calibration laboratories

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2.2.2 Informative

- [1] Safety Health and Environment Specifications for Contractors - GVLIR 0007
- [2] Construction, Safety, Health and Environment Management in Eskom - 32/136 Rev 0 -
- [3] Eskom Information Security Policy - 32-85 Rev 0
- [4] Eskom Vehicle and Driver Safety Management Procedure - 32-93 Rev 0
- [5] Integrated Business improvement – prevention and improvement Standard - 6-366 Rev 0
- [6] Smoking Policy - 32-36 Rev 0
- [7] Alcohol Policy GGP 1209
- [8] Incident Management 32-95
- [9] Mandatory SHE requirements for the Eskom procurement and Supply chain management process - 32-726 Rev 0

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2.3 Definitions

2.3.1 CAS number – is the number allocated to chemical substances by Chemical Abstracts Services based in Columbus, Ohio (United States of America)

2.3.2 Hazard pictogram – is a safety signal indicating the hazard of the item

2.3.3 Contractor – Service provider contracted for supplying specific service to Eskom, Kusile Power Station.

2.3.4 Eskom representative – means the person defined as such in the contract and appointed by Eskom as representative for the purpose of the contract or his duly appointed nominee.

2.4 Abbreviations

Abbreviation	Explanation
ACS	American Chemical Society
AR	Analytical Grade
CAS	Chemical Abstract Services
COA	Certificate Of Analysis
CRM	Certified Reference Material
DIN	Deutsches Institut für Normung (German Institute for Standardization)
EN	European Standard
FGD	Flue Gas Desulphurisation
GHS	Global Harmonised System
GR	Guaranteed Reagents
IEC	International Electro-technical Commission
ISO	International Standards Organisation
LIMS	Laboratory Information Management System
SDS	Safety Data Sheet
NCR	Non-Conformance Report
NEC	New Engineering Contract
PO	Purchase Order
RFQ	Request for Quotation
SANAS	South African National Accreditation System
SANS	South African National Standard
SAP	System Application and Products
WTP	Water Treatment Plant
WWTP	Waste-Water Treatment Plant

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3. User Requirements

3.1 Project description

Supply and deliver laboratory chemicals and consumables on an “as and when required” basis at Kusile Power Station for the period of three (3) years. Refer to the scope of work in Appendix 1.

3.2 General requirements

- (a) The contractor shall ensure that all chemicals and consumables are supplied even if they are not manufactured by them; no repackaging is required.
- (b) The contractor shall supply all materials, consumables, tools, equipment, labour and transport required performing this work, unless otherwise instructed by the Eskom representative.
- (c) All orders and purchases shall be done on System Application and Products (SAP) for Eskom records.
- (d) The Contractor shall only deliver the good quality product/s to the premises after the Purchase Order (PO) number has been released by the buying department and within two to three days after approval of the purchase.
- (e) The Eskom representative shall accurately perform quality control of the product/s received before accepting the product/s at stores as per International Standards Organisation (ISO 9001) standards, no products of bad quality shall be accepted.
- (f) If the chemicals, reagents or products received was accepted and indicated to be of good quality during quality evaluation but fails when being used then it shall be returned to the contractor for replacement of a new batch should the shelf life indicate that the product is still within the specified shelf life from the date received.
- (g) The contractor shall ensure labelling of chemicals and reagents is clear and corresponds with the catalogue number. Label shall be listed as in 3.6.1.
- (h) The contractor shall ensure that a Safety Data Sheet (SDS) in the form as defined in regulation 9A of the Hazardous chemical substances regulations is supplied for each reagent or chemical. Reference where 16 point is defined.
- (i) The contractor shall communicate with Eskom whenever there are any changes, modification or amendments on the product/s.
- (j) The contractor shall ensure that the performance of the product is reliable and accurate.
- (k) All chemical deliveries should be made from 7:00 am to 15:30 pm from Monday to Thursday and from 7:00 am to 11:00 am on Friday, no deliveries should be made after the specified times or on a weekend unless otherwise arranged prior with the Eskom representative.

3.3 Quality Assurance Requirements

- (a) The contractor shall be Deutsches Institut für Normung (DIN) European Standard) EN ISO/IEC 17025:2017, ISO14001 and ISO9001:2015 accredited
- (b) The contractor shall supply chemicals and reagents together with their SDS and Certificate of Analysis (COA) corresponding to specific batch number of chemicals as per SANS

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17025:2017.

- (c) All pH buffer solution shall have verifiable information with corresponding temperature

3.4 Safety, Health and Environmental Requirements

- (a) The contractor shall provide Eskom with SDS for each chemical received. The SDS shall contain product information and shall comply with OHS Act 85 of 1993 and Hazardous Chemical Substances Regulations Section 9A.
- (b) The contractor shall comply with ISO 9001 quality standard, and American Chemical Society (ACS) and EU quality guidelines.
- (c) The contractor shall comply with Globally Harmonised System (GHS) for classification and labelling of chemicals.
- (d) The contractor shall be Hazchem compliant or use Hazchem compliant transporter to transport chemicals throughout the contract period.
- (e) The contractor and the Eskom representative to jointly conduct a baseline risk assessment for the contract after the contract is placed.
- (f) The contractor to submit a method statement for loading, offloading and transportation of chemicals to Eskom premises after the contract is placed and before the first delivery of chemicals.

3.5 Training Requirements

- a) The contractor shall continuously train Eskom chemistry personnel on using some products as per Eskom's request after the commencement of the contract.
- b) The contractor shall provide training for all chemistry staff at Eskom premises when a new product has been purchased.
- c) The contractor shall train the Eskom chemistry personnel on the storage and handling of chemicals after commencement of contract.

3.6 Adherence to Eskom policies and standard

- (a) The Contractor shall comply with Eskom policies and site regulations, including but not limited to, lifesaving, smoking policy, zero tolerance on alcohol usage, etc. These requirements will be detailed during induction training process.
- (b) The Contractor shall comply with all requirements upon signing the contract as stipulated in the National Engineering Contract (NEC)

3.7 Documentation

- (a) The contract shall be authorised and signed by responsible person(s) between the contractor and the Eskom representative.
- (b) The contractor shall submit all required documentations including the supporting documents that they are accredited and are the sole manufacturer or contractor of their brands as part of tender returnable.

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3.8 Key Dates

This gives realistic time that is needed to place the contract. The key projects steps before the contract is concluded are as follows.

- (a) URS completion
- (b) Contract strategy approval
- (c) Squad checks
- (d) Tendering committee
- (e) Request for Quotation (RFQ)
- (f) Clarification meeting
- (g) Tender Evaluation
- (h) Contract negotiation and placement.

3.9 Specifications

3.9.1 The labels on the chemicals shall include the following:

- (a) Full name of product and trade name
- (b) Chemical formula and molar mass
- (c) Specific gravity (for acids)
- (d) Pack size/ volume /mass with appropriate scientific units
- (e) Batch/ lot number
- (f) Date manufactured and minimum shelf-life date
- (g) Assay and/ or Maximum limits of impurities
- (h) Hazard pictogram
- (i) CAS number
- (j) Grade and purity
- (k) Storage and safe handling

3.9.2 The SDS of the product shall contain 16 points information as per OHS Act 85 of 1993, Annexure: 8, Hazardous Chemical Substances Regulations. The 16 points information as follows.

- (a) Product and company identification.
- (b) Composition
- (c) Hazard identification
- (d) First aid measures
- (e) Firefighting measures

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- (f) Accidental release measures
- (g) Handling and storage.
- (h) Exposure controls/Personal protection
- (i) Physical and chemical properties
- (j) Stability and reactivity
- (k) Toxicity Information
- (l) Ecology information
- (m) Disposal considerations.
- (n) Transportation information
- (o) Regulatory information
- (p) Other information

3.9.3 The COA shall contain the following information:

- (a) Chemical name
- (b) Chemical formula
- (c) Batch number and CAS number
- (d) Date of analysis
- (e) Analysis performed (Product Specification and Batch results)
- (f) Methods used for each analysis
- (g) Signature of responsible laboratory technician and supervisor

3.9.4 Technical support

- (a) The contractor shall advise and assist Eskom representative on selection, use, storage and handling of the products to be supplied.
- (b) The contractor shall advise and assist the Eskom representative on compatibility of chemical storage to avoid chemical reaction of non-compatible chemicals

3.9.5 Communication and correspondence

The Contractor shall communicate with the contract manager and the buyer if there are any changes on the orders or modifications on the product. The communication shall be professionally sent preferably via e-mail or alternatively by post. The correspondence shall include the following:

- (a) Kusile Power Station and address
- (b) Contract number and contract description
- (c) Contractors VAT number
- (d) Contractors Company's registration number.
- (e) Correspondence subject matter

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- (f) Contractors contact details
- (g) Clear description of the changes or modification of the product
- (h) Date
- (i) Signatures of responsible person(s).

3.10 Tender requirements

The contractor shall supply a price list and all returnables as requested by tender document. Kusile Power station shall evaluate the tenders according to Eskom' policy and select the suitable successful contractors. Thereof the contract shall be negotiated with the successful contractor.

4. Acceptance

This document has been seen and accepted by:

Name	Designation
Evans Ramabina	Snr Chemist Chemistry
Charlotte Tsumaki	Chemical Services Manager
Grace Olukune	Engineering Group Manager (Acting)

5. Revisions

Date	Rev.	Compiler	Remarks
January 2021	3	BD Ndala	Contract expired in May 2021. Title amendment. New template
April 2016	2	RN Tjiana	Change chemical grade and pack. Title amendment
December 2015	1	RN Tjiana	First issue

6. Development Team

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

- Khanyi Manganyi
- Evans Ramabina

7. Acknowledgements

- None

8. Records

Signed invoices, signed Non-Compliance Report (NCR), Signed Minutes of the meeting

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Appendix A –List of Required Chemicals

Chemical description	Pack	Grade	Total Quantities
Ammonia iron (II) Sulphate hexahydrate	500g	AR	30
Ammonia molybdate	500g	AR	10
Ammonium chloride	500g	AR	30
Ascorbic acid	500g	GR	25
Buffer pH 4	500ml	AR	240
Buffer pH 7	500ml	AR	240
Buffer pH 9.18	1L	AR	25
Buffer pH 9.22	1L	AR	25
Buffer pH 10	500ml	AR	75
Molybdate reagent	500 ml	AR	20
Citric acid reagent	500 ml	AR	20
Amino acid reagent	500 ml	AR	20
Calcium carbonate	250g	AR	25
Calcium hydroxide	500g	AR	25
Calcium standard 1000ppm	500ml	AR	50
Calcium standard	Ampoule		15
Calconcarboxylic acid.	5 g	GR	10
Camphor pellets	250g	GR	30
Citric acid salt	500g	GR	25
Chloride standard 1000ppm	500ml	AR	100
Chloride standard	Ampoule		25
Copper standard 1000ppm	500ml	AR	10
Cooper standard	Ampoule		10
DPD 1 (N,N-diethyl-p-phenylene-diamine 1)	pkts	AR	15
DPD 3 (N,N-diethyl-p-phenylene-diamine 3)	pkts	AR	15
Diisopropylamine	2.5L	AR	360
Di-sodium-tetraborate-decahydrate (Borax)	500g	AR	10
Eriochrome black T	250g	AR	10
Ethanol 70%	2.5 L	AR	45
EDTA (Ethylene diamine tetra acetic acid)	500g	AR	45
Flouride standard 1000ppm	500ml	AR	25
Hydrochloric acid 32%	2.5L	AR	55
Iron standard 1000ppm	500ml	AR	25
Iron standard	Ampoule		10
Iron chloride	500g	AR	5
Iodine indicator	500g	AR	5
Manganese standard 1000ppm	500ml	AR	10

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Manganese standard	Ampoule		10
Magnesium standard 1000ppm	500ml	AR	25
Magnesium standard	Ampoule		15
Methyl red indicator	250g	AR	5
Methyl orange	250g	AR	5
Nitrate standard 1000 ppm	500ml	AR	50
Nitrate standard	Ampoule		25
Nitric acid 65% (ultra-pure)	2.5L		25
Nessler reagent	500ml	AR	10
Oxalic acid	500 g	AR	25
Potassium hydroxide	500g	AR	25
Potassium standard 1000ppm	500 mL	AR	10
Potassium standard	Ampoule		10
Potassium chloride	500g	AR	1080
Potassium dichromate	500g	AR	25
Potassium dihydrogen orthophosphate	500g	AR	25
Potassium hydrogen phthalate	500g	AR	25
Potassium iodide	500g	AR	25
Potassium metabisulphate	500g	AR	25
potassium nitrate	500g	AR	25
Potassium permanganate	500g	AR	25
Potassium standard 1000ppm	500ml	AR	25
Potassium sulphate	500g	AR	10
Phenolphthalein indicator	500 g	AR	5
Phosphate standard 1000ppm	500ml	AR	25
Phosphate standard	Ampoule		10
Sodium carbonate	500g	AR	60
Sodium flouride	500g	AR	15
Sodium thiosulphate	500g	AR	25
Sodium hydrogen carbonate / sodium bicarbonate	500g	AR	75
Sodium hydrogen phosphate	500 g	AR	25
Sodium hydroxide pellets	500g	AR	30
Sodium standard 1000ppm	500ml	AR	50
Sodium standard	Ampoule		50
Sodium sulphite	500g	AR	10
Sulphate standard 1000ppm	500ml	AR	50
Sulphate standard	Ampoule		25
Sulphuric acid	2.5L	AR	50
Sodium chloride	500g	AR	25
Sodium sulphate	500g	AR	25
Silica standard 1000ppm	500ml	AR	50

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Tartaric acid	500g	AR	30
Turbidity standard (formazin) 4000 NTU	1L	GR	5
Turbidity standard (formazin) (<0.5 to 7500 NTU)	set	GR	5
Potassium chloride	50 g	GR	10
Potassium dihydrogen phosphate anhydrous	50 g	GR	10
di-potassium hydrogen phosphate anhydrous	50 g	GR	10
Potassium iodide	50 g	GR	5
Potassium nitrate	50 g	GR	5
Potassium sulphate	100 g	GR	5
di-Sodium hydrogen phosphate anhydrous	50 g	GR	5
Sodium iodide	50 g	GR	5
Sodium nitrate	50 g	GR	10
Sodium sulphate anhydrous	50 g	GR	10
Molecular sieves 0.3 beads with moisture indicator	250 g		15
Molecular sieves 0.3 beads	250 g		15
Buffer titrisol pH 4	ampoule		5
Buffer titrisol pH 7	ampoule		5
Buffer solution 4 (titripac)	10 L		5
Buffer solution 7 (titripac)	10 L		5
Potassium chloride solution (3 mol/l)	500 ml		15
Anion multi-element standard I	500 ml		5
Anion multi-element standard II	500 ml		5
Cation multi-element standard I acc to EN ISO 14911	100 ml		25
UV standard I	10 ml		20
UV standard II	10 ml		20
Rectangular cell quartz 10 mm	2 cells		10
TOC standard acc to EN 1484/DIN 38409-H3	100 ml		25
Chemizob- Alkalis	1 kg		15
Chemizorb-Acid	2 kg		15
Extran MA 02 liquid neutral for glass cleaning phosphate free	10 L		15
Extran AP 22	10 L		15
Adapter composed of PP for 10 Extran canister	1 piece		5
Sodium hydroxide pellets	500 g	GR	40
Gloves latex powder free (small)	100/box		500
Gloves latex powder free (Medium)	100/box		500
Gloves latex powder free (Large)	100/box		500
Chloride titrisol	Ampoule		25
Flouride titrisol	Ampoule		25
Nitrite titrisol	Ampoule		25
Phosphate titrisol	Ampoule		25
Sulphate titrisol 1g H2SO4 in water	Ampoule		25

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Tris(hydroxymethyl)aminomethane	80 g		10
Potassium dichromate	80 g		10
Ethanol 99.5%	2.5 L	AR	30
Filter paper 0.45 micron, 47 mm membrane	box		50
Hydrofloric acid 38-40 %	2.5 L	AR	5
Acetone 99.5%	2.5 L	AR	59
Toluene 99.5%	2.5L	AR	100
Methanol 99.5%	2.5L	AR	25
Combimethanol	2.5 L		25
Hydranal composite 5	2.5L		25
Water standard 0.1%	8 ml x10		25
Combititrant 5	2.5 L		25
Chloroform	250 ml		40
Combicoulomat for cells with diaphragm	500 ml		25
Tetrabutylammonium hydroxide	2.5 L		10
Electrolyte solution	500 ml		30
Sample bottles PE LD wide neck with caps 1000 ml	Box		25
Sample bottles PE LD wide neck with caps 2000 ml	Box		25
Cell culture flask with red standard caps sterile, 50 ml	Box		15
Cell culture flask with red standard caps sterile, 250 ml	Box		25
Cell culture flask with red standard caps sterile, 500 ml	Box		3
Plastic Erlenmeyer flask, 250 ml	250 ml		75
Glass beaker, 120 ml	piece		60
Aluminium foil 0.010/80mm	box		5
Low level Metrohm IC sample bottles, 50ml	piece		1000
Cadmium granular	500 g	AR	1
Filter paper 125 mm diameter	100/pack		70
Jumbo paper roll (158 mm)	roll		65
Jumbo paper roll (210 mm)	roll		65
Micropipette tips (0.1mL-1 mL)	pack		15
Micropipette (0.1mL -1 mL)	1 piece		15
Micropipette (1mL-10 mL)	1 piece		15
Micropipette tips (1mL-10 mL)	pack		15
Pipette (1 -10 mL)	1 piece		10
Pipette tips (1-10 mL)	pack		10
Rubber less syringe (10 mL)	100/box		50
Silver nitrate	100 g	AR	45
Starch soluble (Thiodene)	500 g	AR	45
EDTA 0.2N/0.1M Solution,2.5L	2.5L		30
Total Hardness standard 1000ppm	500ml		30
Total alkalinity 1000ppm	500ml		30

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Conductivity Standard 1000 uS/cm	500ml		30
IC eluent concentrate	64mmM and 20mM		25

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Appendix B – Health and Safety Regulations

The Contractor and his subcontractors shall always comply with safety regulations imposed by any Act of Parliament, ordinance or any regulation or by-law of any local or statutory authority. Specifically, the Contractor shall comply with:

The Occupational Health and Safety Act, 1993, and all Regulations made there under

All Eskom Safety and Operating Procedures including:

Construction Safety 32-136

Cardinal Rules 32-421

Driver Safety 32-93

Vehicle Safety 32-345

Incident Management 32-95

Alcohol Policy GGP 1209

Smoke Policy 32-36

Eskom Safety Principles:

No operating condition, or urgency of service, can justify endangering the life of anyone or cause injury.

Conduct business with respect and care for people and the environment and, ensure that adequate resources are available for SHE management.

All employees and Contractors are responsible for their own and that of their colleague's safety

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.

No extension of time will be allowed as a result 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. 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 therewith from Eskom.

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