

	Scope of Work	Kusile Power Station
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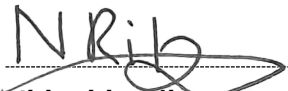
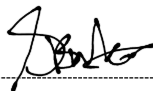
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1. Introduction

The Kusile Water Treatment Plant (WTP) produce demin and potable water that is within the chemistry standard by utilising different technology. These technologies include membranes which are used for producing both potable and demin water. Kusile is using Gas Transfer Membrane (GTM) technology, for the removal of CO₂ and O₂. Ultra Filtration (UF) membrane technology is used for the removal of virus, bacteria colloidal matter.

For the plant to work within the desired plant availability, and to ensure that the units always have a supply of demin water, the membranes must operate effectively, with time the membranes efficiency/effectiveness get reduced. With reduced efficiency the quality of both potable and demin water produced won't meet the chemistry standard. The membrane needs to be replaced after a certain period for Kusile it is after 5 years of operation.

This document describes the detail of the applicable plant areas, scope of work, quality requirements and specifications.

This scope was reviewed due to UF Membrane cassette being obsolete, see attachment letter from Original Equipment Manufacturer (OEM) below.

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VEOLIA Water Technologies & Solutions
3239 Dundas St W
Oakville
Ontario
L6M 4B2, Canada
Tel: +1 905 485 3030

Subject: ~~ZeeWeed~~ ZW5000 64 Module Cassette Product Retirement Notification

To our valued customer,

This letter is to inform you of the retirement of the ~~ZeeWeed~~ ZW5000 64 Module Cassette Membrane Product.

As part of VEOLIA's commitment to continuously offer our customers the most advanced membrane technologies at competitive prices, we determined the retirement of the ~~ZeeWeed~~ ZW5000 64M Cassette.

With the introduction of the ~~ZeeWeed~~ ZW5000 68 Module Cassette, the ~~ZeeWeed~~ ZW5000 64M Cassette was replaced as our standard commercial offering.

Your local VEOLIA Water Technologies & Solutions [sales person](#) is happy to work with you to begin planning your plant conversion and to answer any questions you may have.

Yours sincerely,

VEOLIA Water Technologies & Solutions
3239 Dundas St W, Canada, Oakville L6M 4B2, Canada Tel: +1 905 485 3030

SUEZ confidential and proprietary information
proposal for PROXA ESKOM Kusile PP
proposal number 587280- revision 0 - February 5th 2024

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2. Supporting Clauses

2.1 Scope

This document covers the requirements for the procurement and delivery of membranes for the UF module, GTM system, storage and refurbishment of the existing cassette.

2.1.1 Purpose

The purpose of this document is to outline the Scope of Work (SOW) and technical specification for the Kusile Power Station WTP membrane replacement.

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2.1.2 Applicability

This document applies to all stakeholders involved in the Kusile Power Station project.

2.1.3 Effective date

This document will be effective from the date of its authorisation.

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 System
- [2] Occupational Health and Safety Act No. 85 of 1993
- [3] 32-727-Eskom Safety, Health, Environment and Quality (SHEQ) Policy

2.2.2 Informative

- [4] 240-86973501 - Engineering Drawing Standard

2.3 Definitions

2.3.1 Disclosure Classification

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

2.3.2 Contractor

Service provider contracted to provide a specific service to Eskom, Kusile Power Station.

2.3.3 Employer

Eskom, Eskom Kusile Power Station or representative

2.4 Abbreviations

Abbreviation	Explanation
EMP	Environmental Management Plan
OEM	Original Equipment Manufacturer
UF	Ultra-Filtration
GTM	Gas Transfer Membrane
WTP	Water Treatment Plant

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Abbreviation	Explanation
MMD	Mechanical Maintenance Department
QCP	Quality Control Procedure

2.5 Roles and Responsibilities

2.5.1 Contractor

- Executes the defined scope according to contractual agreements
- Submits all relevant and necessary documentation requested by the Employer once works are completed

2.5.2 Employer

- Review and approves the delivered item

2.6 Process for Monitoring

This works will be monitored through the approved QCP and ITP.

2.7 Related/Supporting Documents

None.

3. SCOPE OF WORKS

This document provides the requirements and specifications relating to the procurement of membranes for WTP at Kusile power station by the *Contractor*. These requirements are outlined to ensure the correct membrane are procured and delivered to Kusile power station without delays.

3.1 WTP membrane replacement

3.1.1 Procurement and delivery

The following membrane must be procured and delivered to Kusile.

Quantity	Material Number	Component	Description
24	644958	Primary GTM Membranes	FILTER, FLUID: TYPE: GAS TRANSFER MEMBRANE; FILTERING MEDIA: WATER; MATERIAL: POLYPROPYLENE; FILTERING ELEMENT QUANTITY: 1; DESIGN TYPE: CYL; MODEL NO: G533RP; X50 FIBRE; MICRON IN/OUT: 220/300U; DIMENSIONS: DIA 356MM X LG 1.156M; 14X28 LIQUI-CEL MEMBRANE CONTATOR; SOURCE DOCUMENT REFERENCE: SMC-0114-12-9024

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90	644959	Second GTM Membranes	FILTER, FLUID: TYPE: GAS TRANSFER MEMBRANE; FILTERING MEDIA: DEMIN WATER; MATERIAL: POLYPROPYLENE; FILTERING ELEMENT QUANTITY: 1; DESIGN TYPE: CYL; MODEL NO: G531RP; X40 FIBRE; MICRON IN/OUT: 200/300U; DIMENSIONS: DIA 356MM X LG 1.156M; 14X28 LIQUI-CEL MEMBRANE CONTATOR; SOURCE DOCUMENT REFERENCE: SMC-0114-12-9024;
768		UF Membranes module & its accessories	Module type: ZW500D13-2, Module dimension (H X W X D) mm 2 198 x 844 x 49, Pore size 0,04 µ, Fibre material PVDF, Surface properties non-ionic and hydrophilic, Nominal surface area 40,9 m², Fiber diameter (outside/inside) 1.9 mm/0.8 mm Flow path Outside-in

The membranes/spares and components will be supplied to the “goods received” section of the Kusile main store where it will be received by the material management section. The spares will be delivered with all of the required data books and certificates, where required.

Kusile Stores Working Times: Monday – Thursdays: 07h00 – 16h15
Fridays: 07H00 – 12h00

Only once the spares have passed the Quality control checks and are booked into the system can payment be effected.

The Spares must be the same in all respects when compared to the original equipment, supplied to Eskom by OEM under contract. This includes all aspects such as design, materials and material specifications, manufacturing, including manufacturing processes and acceptance testing. Where spares offered deviate from the original in any respect, it should be indicated to the *Employer*.

It is the *Contractor's* responsibility to ensure that correct spares are delivered. If the incorrect spares are delivered, the spares will have to be replaced with the correct spares at the *Contractor* cost, this includes transport and delivery. The Delivery and Transport Costs (including off-loading items) must be included in the quotation.

The following packaging requirements should be adhered to:

- The Goods are to be packaged in such a manner that it can be transported and stored for an extended period of time without resulting in damage to the goods.
- This includes damage due to moisture ingress, corrosion, vibration from the power station etc.
- Where lifting gear is utilised to move the goods, the packaging should allow the lifting operation and ensure that the goods are not damaged in any way during the process.
- It will also not be necessary to open packaging for any lifting or transport operation.

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- e) Where eyebolts are fitted to move the goods, these eyebolts should be fitted such a way that they can be easily removed and replaced with the Purchaser's eyebolts, ensuring that the packaging stays intact.
- f) The different spares types are to be packaged separately in such a way that each type can be stored separately.
- g) Packaging and labelling of spares should ensure that the spare can be identified without opening the packaging.
- h) Where possible the packaging should ensure that parts can be positively identified through the packaging. Where this is not possible, the packaging should allow opening and closing of the packaging and still maintain the packaging integrity afterwards.
- i) Delivery packaging to have the following detail on it as a minimum (removable adhesive sticker if possible):
 - Order number,
 - A short description of component
 - The stock number
 - Manufacturing date, where possible

3.1.2 Storage

- The New modules (preserved with glycerine solution, bagged and factory- sealed) UF membrane module might need to be stored for a period of 6 to 12 months.
- UF Membrane modules to be stored and preserved in the right conditions as recommended by the Original Equipment Manufacturer (OEM)
- To be stored in a reputable place/warehouse that has insurance, imply that should anything happen to the stored membrane, they will replace them
- Membrane to be made available on demand from the employer

3.1.3 Discard old membrane.

Both old/used GTM and UF membrane module accessories that are not in usable condition are to be discarded off as general waste, environmental standard to be followed.

3.1.4 Installation

- Installation of the GTM membranes will be done by the Kusile Water Treatment Plant mechanical maintenance team (MMD). MMD will be required to compile a Quality Check Procedure (QCP) for the execution of the works.

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3.2 Refurbishment and commissioning

The existing cassette ZW500D64/60 must be refurbished using the new module that will be procured. The existing aerator tubes and permeate saddle and collector must be replaced with new ones.

After the refurbishment is done the system must be fully commissioned and ensure the Membrane Integrity Test (MIT) is fully functional as well.

3.2.1 Assessment

Full assessment must be done on one cassette per train by the OEM on the current existing system, the Membrane Integrity Test (MIT) system and give a fully detailed report with recommendation on the items/systems that require replacement or installation.

Record the following information for each cassette assessed/inspected:

- Site name.
- Inspector's name.
- Inspection date.
- Train number.
- Cassette position.
- Cassette serial number.

3.2.2 Test

Analyse the remaining life span of the old module that were removed from the existing system.

3.2.3 Training

Training on the installation, commissioning, and repairs of the UF membrane module shall be conducted, this include on-job and classroom training the targeted audiences will be:

- Maintenance
- Engineering
- Commissioning

The *contractor* shall provide Training, commissioning, and maintenance manuals, which shall be reviewed by the employer before training can commence.

3.3 Quality Control Procedures

The Contractor must compile the Quality Control Procedures (QCP) and Inspection Test Plans (ITP) and submit to the *Employer* for review.

The following must be developed and approved by Engineering before the refurbishment works can begin.

- Quality Control Plan (QCP).

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- Inspection Test Plan (ITP) for the UF module and GTM.
- Method statement for refurbishment.
- Commissioning procedure.
- Check sheet to be used for all activities.

Eskom is ISO 9001:2015 certified, it is therefore important that the contractor complies with the requirements of ISO 9001:2015 quality standard.

3.4 Management Strategy and Start Up

3.4.1 Contractor's plan for the service

Operational Hours

The *Contractor* notes that the normal station operating hours are as follows:

07:00 – 16:15 (Monday – Thursday)

07:00 – 12:00 (Fridays)

The *Contractor* makes time allowance to perform *service* after-hours for scheduled work not to interfere with station operations.

Contractor's Programme

The *Contractor* provides programmes or schedules for his inspection and refurbishment activities. The programme shall outline the sequence in which the *Contractor* proposes to conduct his operations. The programmes provide clear, concise and consolidated activities for his work plans. The *Contractor's* programme incorporates the programmes of all his *Subcontractors*, if any. The interface points between his *Sub-contractor's* works and that of the main Contractor are clearly defined. The *Employer* approves the *Contractor's* programme prior commencement of work activities.

3.4.2 Management meetings

The Employer and the *Contractor* meet as and when required to report on the overall progress of work activities and as a minimum, the following is addressed:

- Actual progress achieved on project activities.
- Management of delays encountered.
- Key issues and risks of concern and mitigation actions

Management Meetings will be held on an as and when required basis between the Service Manager and the *Contractor*.

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3.4.3 Contractor's management, supervision and key people

The *Contractor* submits to the Service Manager an organisational structure of key personnel of the main *Contractor* and his *Subcontractors*. In the case of an association/joint venture/consortium, it should be indicated how the duties and responsibilities are to be shared. If the *Contractor* intends on making use of the services of a *Subcontractor* for sections of the scope, the delegation of duties and responsibilities should be clearly indicated.

3.5 Environmental Requirements

- a) The *contractor* must identify all aspect and impact related to the scope of work and put measures in place to minimise/prevent environmental contamination.
- b) All waste including scrap materials to be disposed in allocated bins onsite.
- c) In terms of Sec 28 of National Environmental Management Act 107 of 1998: Every person who causes has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing, or recurring.
- d) If any incident occurs, it must be reported to the Environmental Department immediately or within 24 hours of occurrence.

3.5.1 Environmental constraints and management

- a) The *Contractor* shall have a documented environmental management system relating to the scope activities.
- b) The *Contractor* shall prepare an environmental management plan (EMP) relating to the scope activities. The EMP must include all aspects and impacts relating to the *Service* to be carried out.
- c) The *Contractor* shall comply with the Eskom Kusile Power Station environmental policies, standards and procedures.
- d) The *Contractor* shall appoint trained and competent personnel in writing, who will be responsible for implementing all environmental related requirements during the contract duration.
- e) All spills/emergency incidents shall be reported to the *Service Manager* immediately on occurrence. The *Contractor's* reporting of the incident shall include the following but not limited to:
 - o The date and time of the incident
 - o The cause of the non-conformance/incident.
 - o The proposed actions to correct and prevent recurrence.

3.6 Health and safety risk management

- a) The *Contractor shall* complies with the Occupational Health and Safety Act, 85 of 1993, Employer's SHEQ Policy, standards, procedures, guidelines and specifications, when

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performing the Service. The *Contractor* always ensures safety awareness through continuous training and interventions.

- b) The *Contractor* is responsible for the supervision of his employees, agents and sub-Contractors, and takes full responsibility and accountability in ensuring that they are competent and aware of all safety related requirements.
- c) The *Contractor* ensures that all statutory appointments that are required by the Employer are recorded in writing and that all appointees and/or agents fully understand their responsibilities and are trained and competent to execute their duties.
- d) The *Contractor* provides a health and safety plan based on the Employer's Safety, Health and Environmental Specifications.
- e) The *Contractor* notes that all persons entering the site shall undergo the Employer's safety induction course prior to site establishment and commencement of works.
- f) The *Contractor* completes activity risk-based assessments and provides the assessments to the Service Manager for acceptance before activities take place.
- g) The *Contractor* notes that the Employer has full rights to issue the *Contractor* with a STOP WORK ORDER should the Employer's Service Manager become aware of any unsafe working procedures or conditions.
- h) The *Contractor* is responsible to report all incidents and potential threats to safety and health of persons on site.

3.7 Data Pack and removal tools

Upon completion of the scope, the *Contractor* is required to submit the following, in the form of a data pack:

- All the signed QCP and ITP documentation
- All the supplied material documentation/product data sheets
- The module removal tools.

3.8 General

The following is required from the *Contractor*:

- Adheres to the South African Occupational Health and Safety Act No. 85 of 1993 and the regulations promulgated under the Eskom Safety, Health, Environment and Quality (SHEQ) Policy 32-727.
- Provides a detailed Method Statement for all work activities and details the activity durations. All method statements are reviewed and accepted by the Employer prior commencement of Works. The *Contractor* in his method statements includes the following as a minimum:
 - A comprehensive construction/installation methodology of the project activities.
 - A clear description of the responsibilities of the *Contractor's* personnel involved in the activity,
 - Health, safety and quality control considerations for the activity.
 - All plant, equipment and machinery required to complete the project activity.
 - Temporary works to be used for the Works.
 - Technical Data Sheets for all materials used including product description, composition, material and performance properties, installation, application procedures and product use limitations etc.

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- Plans for confining, collecting, and disposing of waste materials as a result of removal operations, where applicable.
- Works required to safeguard existing infrastructure and services.
- Manage his access to the working areas and the site to ensure none of the existing plant that is not in the scope is damaged.
- Manage his activities on site to ensure that no interference takes place between his work and that of others.
- Submit a project specific safety file to the *Employer* for acceptance, prior to the start of the works.
- Identifies a registered waste disposal site, for dumping of waste, which must be approved by the *Service Manager*

4. Acceptance

This document has been seen and accepted by:

Name & Surname	Designation
Grace Olukune	Engineering Group Manager
Busi Nkomo	Auxiliary Plant Engineering Manager
Nhlanhla Rikhotso	Auxiliary Senior Engineer
Thomas Mphagi	Maintenance Supervisor
Cylia Malebana	Senior Advisor Environmental
Nolwazi Mnisi	Material Management Manager
Tumi Mosaka	Finance Manager
Thobile Yonga	Manager Occupation and Hygiene
Matshidiso Kgafane	Procurement Manager
Mapula Chauke	Buyer
Mpume Mthethwa	Project Coordinator
Wenziwe Mathebula	Project Manager

5. Revisions

Date	Rev.	Compiler	Remarks
September 2022	1	Sam Motluguneng	New document

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Date	Rev.	Compiler	Remarks
June 2024	2	Sam Motluguneng	Scope updated due to obsolete UF system

6. Development Team

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

- Sam Motluguneng
- Nhlanhla Rikhotso

7. Acknowledgements

Not applicable.

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