



public works & infrastructure

Department:
Public Works and Infrastructure
REPUBLIC OF SOUTHAFRICA

TERMS OF REFERENCE (Scope of Work)

KING WILLIAM'S TOWN AND SURROUNDING AREAS: OPERATION AND MAINTENANCE OF WATER CARE FACILITIES, BOREHOLES AND WATER SOFTENERS

DEPARTMENT OF PUBLIC WORKS AND INFRASTRUCTURE

GQEBERHA REGIONAL OFFICE

EBEN DONGES BUILDING

CORNER ROBERTS AND HANCOCK STREETS /

PRIVATE BAG X 3913

NORTH END

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A1. Enquiries

Please note that all enquiries shall be limited to the contents of this document and shall be in writing, emailed to the Project Leader's details appearing in the annexure / elsewhere on the supplemental documents.

A2. Documents to be submitted by prospective professional service provider as part of the proposal

The following documents are required upon submission:

- A2.1. Company profile including geographical spread of office locations;
- A2.2. Bid / proposal outlining the proposed methodology or how the scope of work will be carried out;
- A2.3. Curricula vitae of project team /project leaders outlining individual experience, certificates of professional registration and qualification(s) in the relevant field(s);
- A2.4. Full particulars of company's experience in the field, outlining specific references and contact numbers. Department of Public Works and Infrastructure shall have the right to contact referenced End Users to verify the nature, quantity and quality of services provided.

Bidders that are qualified and meet set requirements after pre-evaluation criteria has been conducted may be required to present proof of concept.

A3. Costing

This is a fixed rate contract. Rates quoted for individual quantities shall remain fixed, irrespective of any upward or downward variation in such quantities and no escalation will be paid.

A4. List of abbreviations and Definition of Terms

A4.1. Abbreviations

BDRR	Blue Drop Risk Rating
BDS	Blue Drop System
CIN	Component Identification Number
CV	Curriculum Vitae
DCS	Department of Correctional Services
DPW	Department of Public Works
DWQ	Drinking Water Quality
DWS	Department of Water Sanitation
ECSA	Engineering Council of South Africa
EUL	Expected Useful Life
FCA	Facility Condition Assessment
GDS	Green Drop System
GIS	Geographic Information System
HR	Human Resources
IT	Information Systems
MOU	Memorandum of Understanding



NIAMM	National Immovable Asset Maintenance Management (Framework)
O & M	Operations and Maintenance
RUL	Remaining Useful Life
SABS	South African Bureau of Standards
SACNASP	South African Council of Natural Scientific Profession
SANDF	South African National Defence Force
SANS	South African National Standard
SAPS	South African Police Services
SCM	Supply Chain Management
SOP	Standard Operation Procedure
SP	Service Provider
WHO	World Health Organization
WRC	Water Research Commission
WTW	Water Treatment Works
WWRAP	Wastewater Risk Abatement Plan
WWTW	Wastewater Treatment Works

A4.2. Definitions

- A4.2.1. **Corrective maintenance:** This entails regular observation of the equipment, identifying pending breakdowns, maladjustment or anomalies of equipment, units or parts of installations and subsequent action to restore installations to the functional condition as before the breakdown.
- A4.2.2. **Critical Component:** Components that are likely to result in a more significant financial, environmental and social cost in terms of impact on organisational objectives and service delivery (NIAMM).
- A4.2.3. **Base Location:** the location as determined by the Employer (DPWI), to be where the Service Provider is based out of for the purpose of service delivery coordination, mileage calculation and cost capping.
- A4.2.4. **Breakdown maintenance:** This entails repair and /or replacement of defective equipment, units or parts of installations following a breakdown that leaves the installation inoperable or unsafe, and subsequent action to restore installations to their normal functional condition, within the maximum down-time allowed.
- A4.2.5. **Emergency maintenance repairs:** These repairs are defined as any work required to rectify an emergency breakdown that disables a complete installation and prevents it from functioning to its designed service level.
- A4.2.6. **Expected useful life (EUL):** The useful life of an asset is the period over which an asset is expected to be available for use by an entity or the number of production or similar units expected to be obtained from the asset by an entity (GRAP).



A4.2.7. **Failure:** A component has suffered a failure when it is no longer capable of fulfilling one or more of its intended functions. A component does not need to be completely unable to function to have suffered a failure.

An example: a pump that is still operating, but is not capable of pumping the required flow rate, has failed – a dominant asset failure mode in this case is performance (NIAMM).

A4.2.8. **Failure mode:** Not all assets fail in the same way. Assets' failure mode status are; (1) performance, (2) condition, (3) capacity / utilisation, (4) Cost of operations.

An example: electricity supply capacity and / or performance are the leading failure modes.

A4.2.9. **Fatal breakdown:** Fatal breakdown is defined as an occurrence when an installation or a specified part thereof fails to operate for any period of time other than during the execution of routine preventative and corrective maintenance activities.

A4.2.10. **Immediate response repairs:** These repairs are defined as repair work required where no breakdowns are allowed at any time.

A4.2.11. **Maximum down-time:** Maximum down-time shall mean the period of time allowed to repair a breakdown, and actual down-time shall mean the measured period from the instant when the breakdown was logged with the Service Provider until the installation has been repaired to its functional specification.

A4.2.12. **National Immovable Asset Maintenance Management (NIAMM) Framework:** Sets out the key principles and practices required for the maintenance of immovable assets through their lifecycle and for the purpose of this document – encompasses the Water Treatment & Waste Water Treatment Plants and Boreholes. The framework includes six documents:

- A4.2.12.1. NIAMM Management Standard
- A4.2.12.2. NIAMM Accounting Framework
- A4.2.12.3. NIAMM Monitoring and Evaluation Protocol
- A4.2.12.4. NIAMM Planning Guidelines
- A4.2.12.5. NIAMM Competency Framework
- A4.2.12.6. Contractor Development through the Maintenance Industry

The NIAMM framework is accessible at: <https://www.cidb.org.za/resource-centre/downloads-2/#47-94-wpfd-infrastructure-maintenance>



- A4.2.13. **Operational damage** : Operational damage shall be defined for the purpose of this clause as being any damage caused on purpose, by accident or through negligence by the user End User's employees, inmates (where applicable), suppliers, subcontractors, etc. for any reason whatsoever. Where repair work is necessitated during the contract as a result of operational damage caused by End Users or their associates.
- A4.2.14. **Ordinary maintenance repairs**: These repairs are defined as all maintenance work required other than emergency maintenance repairs.
- A4.2.15. **Preventative maintenance**: This entails the rendering of services and servicing of equipment according to a predetermined maintenance control plan to:
- A4.2.15.1. Replace and service components of equipment, units or parts thereof for each installation at prescheduled moments regardless of condition;
- A4.2.15.2. Readjust, reset, clean, corrosion protect all the components of equipment, units or parts thereof for each installation, and
- A4.2.15.3. Carry out all implied actions to maintain installation in their present functional condition.

Preventative maintenance shall be aimed at minimisation of breakdowns.

- A4.2.16. **Remaining useful life (RUL)**: The time remaining until an asset ceases to provide the required service level or economic usefulness (NIAMM).
- A4.2.17. **Routine Maintenance**: Maintenance carried out during the time that the component is in use. Regular or repeated elementary maintenance activities which usually do not require special qualifications, authorisation(s) or tools.

***Note** - Routine maintenance may include for example cleaning, tightening of connections, checking liquid level, lubrication, etc.



B1. Service Description

Project title:	<i>KING WILLIAM'S TOWN AND SURROUNDING AREAS: OPERATION AND MAINTENANCE OF WATER CARE FACILITIES, BOREHOLES AND WATER SOFTENERS FOR A PERIOD OF 24 MONTHS</i>		
Tender no:	PET20-2023	Reference no:	

B2. Contract duration and option for renewal

B2.1. Duration: 24 months

B2.2. Option 1: Option to renew for a further period of 12 months, based on good performance.

B2.3. Option 2: Option to renew for a further period of 24 months, based on good performance and biogas collection.

B3. Overview

The Department of Public Works and Infrastructure (DPWI) is an intermediary water service provider for all government installations falling beyond Municipalities' water services infrastructure. The DPWI intends to improve its water services compliance regarding Blue / Green Drop requirements on its wastewater plants, boreholes system, reservoirs, dams, and water treatment plants with the plant capacity of less 2 ML/day. Most of these plants are registered under general authorisation and regulated by the Department of Water and Sanitation (National Water Act No. 36 of 1998). It is critical that the above plants are operated and maintained effectively and efficiently to comply with regulatory requirements.

B4. Objective of document and Broad Scope of Work

Appointment of qualified and suitable Service Providers (SPs) or Consortium with an extensive experience and expertise in water, wastewater, environmental, water resources management civil / mechanical engineering, asset care / management, financial management, and human resources related fields to manage, ensure statutory compliance and fully run the operations, maintenance and monitoring of all Department of Public Works and Infrastructure (DPWI) water care facilities in its Gqeberha (Port Elizabeth) Region, with the intention to acquire and maintain the excellent Blue and Green Drop Scores through Green Drop and Blue Drop Improvement Plans for the plants covered in this document. Furthermore, to maintain good and acceptable condition of all DPW water care infrastructure through proper maintenance.



B5. Site information

B5.1. It is important that Service providers / contractors familiarise themselves with the site prior to submitting a final tender offer and make provision for all material, installation and commissioning where required, equipment use / hire, overhead costs, transport costs, Labour costs (including statutory requirements as per the Basic Conditions of Employment Act, 1997 (No. 75 of 1997)), Occupational Health Safety costs, insurance and profit and / general attendance; in relation to the size and requirements per each facility / site.

B5.2. The Operations and Maintenance (O&M) is required on the following summary (details of part 5: Details of Treatment Plants) Wastewater and Water Treatment Plants:

B5.2.1. Middledrift Prison Wastewater Treatment Works; Middledrift Prison Piggery

B5.2.2. Wastewater Treatment Works; Debenek Wastewater Treatment Works;

B5.2.3. Healdtown Wastewater Treatment Works;

B5.2.4. Bulembu South African Police Service Air Wing Wastewater Treatment

B5.2.5. Works;

B5.2.6. Grahamstown South African National Defence Force Wastewater Treatment Works;

B5.2.7. Fort Brown South African Police: Water Treatment Works.

B6. Addition or reduction of treatment plants

The number of treatment plants, depending on DPWI's requirements, can be added or reduced with written prior agreement of the Service Provider.

B7. Contractual Price Adjustments and Escalation Cap

B7.1. Pursuant to this contract, the rates shall be subject to an annual **escalation cap limited to five percent (5%)** per annum, the base rate being the date of an award of tender;

B7.2. Irrespective of the date of award, no price adjustment will be allowed in the first twelve (12) months after the date of award of the tender;

B7.3. Rates / prices will be escalated in accordance with the competitive escalation rate tendered, not exceeding the escalation cap above. Should the competitive tendered escalation rate be zero percent (0%) per annum, the rates shall not change throughout the term of the contract, including the renewal period;

B7.4. The rates for year two (2) and subsequent years (should the contract be renewed based on performance) shall be escalated as follows:

B7.4.1. Rates for year 2 (per item) = Tendered rates per the bid for year 1 plus the tendered percentage (%) escalation;



B7.4.2. Rates for year 3 (per item) = Tendered rates per the bid for year 2 plus the tendered percentage (%) escalation.

B8. Regulatory Framework

- B8.1. Occupational Health and Safety Act 85 of 1993
- B8.2. Water Services Act (Act. 108 of 1997)
- B8.3. National Water Act (Act No. 36 of 1998)
- B8.4. National Environmental Management Act, 1998 (Act No. 107 of 1998)
- B8.5. Public Finance Management Act (Act No. 1 of 1999) as amended
- B8.6. Immigration Act (Act No. 13 of 2002).
- B8.7. National Infrastructure Maintenance Strategy (NIMS, 2007)
- B8.8. Government Immovable Asset Management Act, 2007 (Act No. 19 of 2007)
- B8.9. Environmental Management Waste Act, 2008 (Act NO.59 Of 2008)
- B8.10. Department of Public Works Green Building Policy (2015)
- B8.11. National Immovable Asset Maintenance Management Framework (NIAMM, 2016)
- B8.12. South African Bureau of Standards (SABS) / South African National Standards (SANS)
- B8.13. Local Authority Bylaws (Respective Jurisdictions)

B9. Document Structure

This document is structured into six (6) sections as follows to maximise use of resources, apportion responsibility and ease of reference / navigation of document:

- B9.1. **Part 1:** Contract, Plant Management and Compliance
- B9.2. **Part 2:** Operations
- B9.3. **Part 3:** Maintenance
- B9.4. **Part 4:** Penalties
- B9.5. **Part 5:** Details of Treatment Plants
- B9.6. **Part 6:** Pricing Schedule

B10. Compliant Invoice

- B10.1. Service Providers must provide compliant invoices to ensure timely payments;
- B10.2. A compliant invoice, for the purpose of this contract comprises of:
 - B10.2.1. Contains the words “Tax Invoice”, “VAT Invoice” or “Invoice”
 - B10.2.2. Name, address and VAT registration number of the supplier
 - B10.2.3. Name, address and where the recipient is a vendor, the recipient’s VAT registration number
 - B10.2.4. Serial number and date of issue of invoice
 - B10.2.5. Accurate description of goods (components / material) and /or services.



- B10.2.6. Quantity or volume of goods (components / material) or services supplied. Itemised billing shall apply where material has been utilised / repair work has taken place on components / subcomponents and furthermore:
- B10.2.6.1. A Component Identification Number (CIN) as outlined on the Asset Register requirement(s) shall appear on the invoice / supporting annexure;
 - B10.2.6.2. A supplier's purchase invoice / copy must be provided for material / goods purchased where such material is unscheduled, for instance, attending to Corrective Maintenance (CM);
 - B10.2.6.3. A comparative quotation from reputable equipment hiring companies where equipment is owned by their firm / company – claims shall only be restricted to equipment hire only, OR;
 - B10.2.6.4. A detailed invoice for equipment hire inclusive of attendance for maintenance (profit and attendance) where equipment is not owned by the company / firm.
- B10.2.7. Value of the supply, the amount of tax charged and the consideration of the supply (value and the tax).
- B10.3. All invoices must be submitted within a period of 60 days after a service has been rendered by the Service Provider – this excludes disputable services.
- B10.4. Non-compliant invoices increase administrative work for DPWI, shall not be paid and will be returned to the Service Provider to effect corrections / provide supplemental information.
- B10.5. **Penalties shall be imposed** on the Service Provider as outlined under the penalty scheme for submitting **non-compliant invoices**.



Part 1: Contract Management & Compliance



1.1. Scope of Work: Contract, Plant Management and Compliance

The Service Provider (SP) is expected to have adequate resources (financial and human) to manage and successfully execute the requirements of this contract. Due to the clustering of various plants into a single contract, it is expected that the overall management of the contract, the respective plant and the compliance thereof will be the sole responsibility of the appointed SP. The following responsibilities should therefore be costed under the Contract, Plant Management and Compliance:

- 1.1.1. Mobilisation (site establishment) and demobilisation;
- 1.1.2. Occupational Health and Safety Compliance;
- 1.1.3. Plant Management (Management of onsite personnel);
- 1.1.4. EPWP Implementation
- 1.1.5. Facility Condition Assessment;
- 1.1.6. Green Drop Regulation Compliance
- 1.1.7. Blue Drop Regulation Compliance
- 1.1.8. Training and Development of Employees

1.2. Mobilisation (site establishment), transition contract management and demobilisation

1.2.1. It is the responsibility of the SP to ensure availability of structures to house all on-site personnel, including provision of furniture and office equipment, which should form part of overhead costs. The SP **must allow costs for** in the contract following for mobilisation, Overhead Costs and demobilisations as follows :

- 1.2.1.1. Name boards;
- 1.2.1.2. Offices and storage sheds;
- 1.2.1.3. Workshops;
- 1.2.1.4. Living accommodation including ablution facilities;
- 1.2.1.5. Water supplies, electric power and communications;
- 1.2.1.6. The Senior Management availability for bi-monthly meetings / as required (for intervention purposes);
- 1.2.2. Physical changes should not be implemented on existing structures without the written approval of the Project Leader/ Scientist/ Engineer ;
- 1.2.3. The appointed SP is expected to immediately ensure the various water care facilities are operated and immediate maintenance is attended to on acceptance of this contract;
- 1.2.4. The SP shall avail skilled personnel with trade qualifications where necessary to ensure the optimal operation and maintenance of various water care facilities;
- 1.2.5. The SP shall ensure seamless discussions and management of personnel and honouring of existing contracts as part of the transition period. The SP shall therefore make provision for services of an experienced Contracts Manager.
- 1.2.6. At the commencement of the contract, within the first month, the Service Provider must draft and provide to DPWI, a preliminary maintenance management plan comprising of personnel to be utilised, preliminary servicing



/ maintenance programme and schedules and the budget / expenditure plan to enable DPWI to plan accordingly. The preliminary plans must be completed within three (3) months of the appointment of the Service Provider to become operational plans for submission and review to DPWI on a monthly basis.

- 1.2.7. At the end of the contract – as part of demobilisation, the SP shall, where required, reinstate the structure as required, leave it in a good condition, and be available to hand over existing documentation (close out report) / contracts of personnel to the newly appointed service provider.

1.3. Occupational Health and Safety Compliance

- 1.3.1. The Occupational Health and Safety Act, 1993 (Act 85 of 1993) stipulates that the Chief Executive Officer is primarily responsible or liable for the health and safety of all his/her employees. This is embedded in Section 16(1) of the said Act. This responsibility or liability is also extended to include a mandatory that performs work on behalf of the employer on her/her premises.
- 1.3.2. A “mandatory” is defined in the said Act as: - “Including an agent, contractor or subcontractor for work, but without derogating from his status in his own right as an employer or user.”
- 1.3.3. In terms of Section 37(2), read with Section 41, of the said Act, it is legally possible for an employer to indemnify himself from this responsibility or liability regarding the actions of the mandatory. Section 37(2) stipulates that there should be a written agreement between the employer and the mandatory regarding the arrangements and procedures between them to ensure compliance by the mandatory with the provisions of the Occupational Health and Safety Act, 1993.
- 1.3.4. By Ensuring that there is a written agreement in place, the Management of the Department of Public Works and Infrastructure is acting in a responsible manner, to ensure that the requirement is indeed being met.
- 1.3.5. To ensure that this written agreement is always honoured, regular inspection of work that is performed will be conducted and if found not complying with the said agreement. A notice of non-compliance will be issued. All work will be stopped and reasons for non-compliance must be given and what corrective action will be taken to rectify the situation must be stipulated.
- 1.3.6. In addition, adherence to the Occupational Health and Safety (OHS) Act, the Service Provider **must allow costs for** but not limited to provision of;
- 1.3.6.1. Provision of a Health and Safety Plan;
- 1.3.6.2. OHS file on-site and maintained / updated on a regular basis and available for inspection by relevant authorities;
- 1.3.6.3. Hazard identification, risk assessment(s) and mitigation for the Service Provider;
- 1.3.6.4. Sufficient personal protective equipment (PPE) and clothing made available to staff – minimum two (2) sets per employee, including but not limited to waterproof/ abrasion-resistant gloves, footwear, eye and respiratory



protection – face visors are effective against splashes (**Allowance elsewhere / provision can be made under this section as well**);

- 1.3.6.5. First aid kits and re-filling;
 - 1.3.6.6. Visible display of the latest OHS Act on-site;
 - 1.3.6.7. Site inspections, incident reporting and formation of a reporting structure;
 - 1.3.6.8. Health and Safety Committee establishment and training;
 - 1.3.6.9. Vaccination of personnel working at wastewater care facilities according to prescribed regulations / requirements
- 1.3.7. The Service Provider is required to sign the hereunder OHS Mandatory agreement.



Mandatory agreement (Occupational Health and Safety Act)

This is a written agreement between

The Department of Public Works and Infrastructure

And

(Name of the MANDATARY)

In terms of the Section 37(2) of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended.

I, _____ representing the MANDATARY do hereby acknowledge that _____ (*mandatory*) is an employer in its own right with duties as prescribed in the Occupational Health and Safety Act, 1993 (Act 85, 1993) as amended and agreed to ensure that all work that will be performed, any article or substance that will be produced, processed, used, handled, stored, or transported and plant and machinery that will be used, will be done in accordance with the provisions of the said Act.

I, furthermore, agree to comply with the Health and Safety requirements and to liaise with the Department should I, for whatever reason, be unable to perform in terms of this Agreement.



1.4. Management and Compliance Human resources

The Service Provider **must allow costs for** and is required to facilitate, ensure and provide evidence of the following human resources as shared services for all the plants;

1.4.1. Employment, verification of qualifications and citizenship, registration & classification of all Management and Compliance Human Resources (internal & external). The required number of personnel at a specific treatment work must be based on the classification of the treatment plant as outlined in Regulation 2834/813 (or as revised) of the Water Services Act (108 of 1997). The Service Provider must familiarise themselves with the requirements of respective sites to enable provision of optimal human resources inclusive of all statutory costs (UIF, Compensation Fund, etc.), Personal Protective Equipment (PPE), profit and employee incentives comprising of, but not limited to:

- 1.4.1.1. Water Quality Scientist;
- 1.4.1.2. Contract Manager / Plant Superintendent;
- 1.4.1.3. Health and Safety Officer;
- 1.4.1.4. Instrument technician (If outsourced must be available when required)
- 1.4.1.5. Civil Engineer (Part-time);
- 1.4.1.6. Other (Specify: _____)
- 1.4.1.7. Training & development of management and compliance Human Resources

** Personnel for O&M appear under respective sections.

1.5. Management / Supervision of operations

1.5.1. The Service Provider **must allow costs for** management / supervision of duties in the operation of works and for related systems and shall interact with the Project Leader/ Scientist/ Engineer to receive any additional guidance or co-ordination necessary to ensure tasks are performed in a manner consistent with the industry best practice. It is the responsibility of the Service Provider to estimate the optimal number of manager(s) / supervisor(s) for the cluster contract as follows:

- 1.5.1.1. Manager(s) / Supervisor(s) of personnel for the duration of the O&M contract;
- 1.5.1.2. Training & development of Manager(s) / Supervisor(s).
- 1.5.2. The service provider shall ensure employees onsite fulfil the following:
 - 1.5.2.1. Perform laboratory tests such as chlorine level and pH, analyse results, takes, or as per each site's operational requirements under applicable water use authorisation (i.e. General Authorisation or License conditions)
 - 1.5.2.2. Maintain laboratory records and equipment, orders supply;
 - 1.5.2.3. Daily inflows and outflows recording and reconciliation of data
 - 1.5.2.4. Maintain inlet works and dispose screenings as per prescribed methods



- 1.5.2.5. Clean and maintain aeration basins and clarifiers. Determines aeration adjustments to aeration basin and adjusts pH as needed;
- 1.5.2.6. Backwash Slow, pressure and rapid sand filters (where applicable)
- 1.5.2.7. Inspects, flushes, desludge and maintain septic tanks and sewage lines;
- 1.5.2.8. Inspects and maintains outlying pump station to ensure standards of operation;
- 1.5.2.9. Performs preventative maintenance on machinery and schedules necessary repairs activities with skilled trades;
- 1.5.2.10. Operates wastewater treatment plant to discharge effluent compliant with the discharge standards applicable to each specific plant;
- 1.5.2.11. Determines desludging patterns;
- 1.5.2.12. Performs ground maintenance;
- 1.5.2.13. Prepares and files daily, weekly, and monthly laboratory result reports with the Department of Water Sanitation Blue/Green Drop System;
- 1.5.2.14. Apply relevant chemicals to maintain quality levels necessary for the operation of a water and wastewater treatment plant;
- 1.5.2.15. Scrutinise laboratory test results and operational data in order to determine plants operations optimisation;
- 1.5.2.16. Perform maintenance, calibration, and operation of equipment;
- 1.5.2.17. Interpret data under unique circumstances or to reconcile conflicting data from laboratory tests and other sources of information although guidelines and procedures are available;
- 1.5.2.18. A service provider shall provide the direct supervision to their employees, the Department's Interns and/or subcontractors, however the service provider shall coordinate with the Department's authorised personnel for the purpose of scheduling work activities and other water/ wastewater operating related items;
- 1.5.2.19. Responsible for repairs and maintenance of the Department's electrical and mechanical components with direct assistance from the Department authorised personnel per operating standards such as contacting equipment representatives for the maintenance of proprietary equipment as it currently applies in the facilities;
- 1.5.2.20. On behalf of the Department apply for new permit or renewals. Address non-compliance notifications.
- 1.5.2.21. Update operation and maintenance manuals and other regulatory manuals
- 1.5.2.22. Conduct semi-annual performance evaluations for all parameters accredited;
- 1.5.2.23. Shall attend to all audits and inspections requested by Department of Water and Sanitation.
- 1.5.3. Document each shift by completing the necessary paperwork;
- 1.5.3.1. The service provider shall be responsible for the proper performance of flow measurement devices (NB: Annual calibration of flow meters).
- 1.5.3.2. Maintenance of maturation ponds shall include all work necessary to maintain water quality regarding aquatic growth.
- 1.5.3.3. Maintenance of building and structures for the duration of the contract.
- 1.5.3.4. Maintenance of the grounds, which would include cutting of grass on a regular basis



1.6. Medical Surveillance and Certificates

The Service Provider **must allow costs for** and perform base medical examinations and obtain medical certificates of all employees prior to their employment, during employment and at the exit of employment. The Service Provider must ensure protection of workers by identifying all risks associated with the O&M of the treatment plants, eliminating or minimising such risks through proper medical, legislative and engineering measures;

- 1.6.1. Initial baseline medical examinations
- 1.6.2. Periodic and exit medical examinations
- 1.6.3. Vaccination of wastewater treatment plants personnel

1.7. Expanded Public Works Programme (EPWP) Implementation

- 1.7.1. All work created under this contract will be subject to the Expanded Public Works Program (EPWP) aimed at alleviating and reducing women, youth and disabled persons' unemployment.
- 1.7.2. The Service Provider shall identify a minimum number of workers from the priority list (where such a list exists) and employ them in various forms of labour to execute operations and maintenance of the facility at statutory labour rates for a minimum of 12 months and train them during that period;
- 1.7.3. Tenderers **must allow costs for** the following employment requirements of the EPWP Beneficiaries including training, reporting, provision of branded Personal Protective Equipment (PPE), profit and employee incentives comprising of, but not limited to the following minimum guidelines applicable for compliance:
 - 1.7.3.1. EPWP beneficiaries including stipends, recruitment in an open, fair and transparent process;
 - 1.7.3.1.1. The following targets in terms of demographics should be complied with in the recruitment of EPWP participants:
 - 1.7.3.1.1.1. Women at **60%**
 - 1.7.3.1.1.2. Youth aged between 18 and 35 years at **55%**
 - 1.7.3.1.1.3. Persons with disabilities at **2%**
 - 1.7.3.1.1.4. **100%** unskilled Labour utilised must reside within the boundaries of the Municipality where this contract is executed, with preference to the local community closest to the contract site. Wherever possible local skilled tradesmen are to be employed on this contract.
 - 1.7.3.2. Social facilitation in communities prior to recruitment;
 - 1.7.3.3. Initial baseline medical examinations;
 - 1.7.3.4. Periodic and exit medical examinations;
 - 1.7.3.5. Training of EPWP beneficiaries in the Water Treatment works-related skills.
 - 1.7.3.6. EPWP reporting by the appointed service provider is required on EPWP participants on a monthly basis and provide the following information to DPWI;
 - 1.7.3.6.1. Certified Identity documents;
 - 1.7.3.6.2. Proof of attendance on project – signed by the relevant manager;



- 1.7.3.6.3. Proof of payment of participant (Can be bank printout showing payment, signed document by each participant confirming payment or a letter from a SP confirming amount payment to workers);
- 1.7.3.6.4. Bank confirmation of participants (this is an Auditor General South Africa requirement especially where Electronic Funds Transfer is provided as proof of payment);
- 1.7.3.6.5. Contract of employment for every participant-signed by all parties;
- 1.7.3.6.6. Signed disability declaration form when Persons with Disability are employed.

DPWI will provide a job reporting template.

1.8. Operation and Maintenance (O&M) Manual

- 1.8.1. *****NB!** An information / data overlap exists between O&M Manuals, Green / Blue Drop requirements, Condition Assessments, Asset Registers, Maintenance, etc. Consequently, cross-referencing is allowed **ONLY** if information is detailed, properly labelled and annexed, as a basis to achieve efficiency and economy.
- 1.8.2. The service provider **must allow costs for** and is responsible for drafting, developing, updating and maintaining a detailed operation and maintenance manual as per the Department of Public Works and Infrastructure's guidelines, **not later than three (3) months after the date of appointment.**
- 1.8.3. The manuals must clearly illustrate the operational functions necessary to run the water and wastewater treatment systems effectively and to delegate them to the relevant operational staff, to create an awareness of the maintenance tasks necessary to ensure the smooth operation of the existing plant, and in order for supervisory staff to monitor the maintenance work being carried out by studying the completed schedules.
- 1.8.4. The manual shall include (but not limited to) information sourced from Original Equipment Manufacturers (OEMs), descriptions, functions, operational procedures, planning and schedules, processes, troubleshooting, hazards, health precautions further details as follows:
 - 1.8.4.1. **Wastewater treatment plant Manual**
 - 1.8.4.1.1. Physical description, functional description & Flow diagram inclusive of all components
 - 1.8.4.1.2. Daily Tasks Checklists
 - 1.8.4.1.3. Monitoring & Reporting
 - 1.8.4.1.4. Flow Measurement
 - 1.8.4.1.5. Inlet Works (IW)
 - 1.8.4.1.6. Activated Sludge Reactor / Bio-filter
 - 1.8.4.1.7. Final Clarifier
 - 1.8.4.1.8. Disinfection Structure System Chlorination
 - 1.8.4.1.9. Irrigation System
 - 1.8.4.1.10. Reed Bed



- 1.8.4.1.11. Final Effluent Discharge
- 1.8.4.1.12. Pumping Systems
- 1.8.4.1.13. Sludge Return and Wasting
- 1.8.4.1.14. Sludge Handling
- 1.8.4.1.15. Sizes, Capacities & Criteria
- 1.8.4.1.16. Safety Aspects
- 1.8.4.1.17. Power interruptions & Standby Generators
- 1.8.4.1.18. Classification of Plant
- 1.8.4.1.19. Applicable Water Quality Standards
- 1.8.4.1.20. Preventative Maintenance (Procedures and schedules)
- 1.8.4.1.21. Corrective Maintenance (Procedures and schedules);
- 1.8.4.1.22. O&M significant drawings (as built) with Geographic Information System (GIS in the format of DWG & PDF)
- 1.8.4.1.23. Equipment-specific O&M information, organised into a vendor/manufacturer data library
- 1.8.4.2. Water treatment plant Operation and Maintenance Manual
 - 1.8.4.2.1. Physical description, functional description & flow diagram inclusive of all components Daily Tasks Checklists.
 - 1.8.4.2.2. Monitoring & Reporting
 - 1.8.4.2.3. Flow Measurement
 - 1.8.4.2.4. Inlet Works (Coagulants, Flocculants mixing)
 - 1.8.4.2.5. Sedimentation Tanks
 - 1.8.4.2.6. Sand Filters
 - 1.8.4.2.7. Sludge handling
 - 1.8.4.2.8. Disinfection Structure System Chlorination
 - 1.8.4.2.9. Final water Discharge
 - 1.8.4.2.10. Pumping and storage systems
 - 1.8.4.2.11. Sizes, Capacities & Criteria
 - 1.8.4.2.12. Safety Aspects
 - 1.8.4.2.13. Power interruptions & Standby Generators
 - 1.8.4.2.14. Classification of Plant
 - 1.8.4.2.15. Applicable Water Quality Standards
 - 1.8.4.2.16. Preventative Maintenance (Procedures and schedules)
 - 1.8.4.2.17. Corrective Maintenance (Procedures and schedules);
 - 1.8.4.2.18. O&M significant drawings (as built) with Geographic Information System (GIS in the format of DWG & PDF)
 - 1.8.4.2.19. Equipment-specific O&M information, organised into a vendor/Manufacturer's data library
 - 1.8.4.2.20. Process Control of the plants' components (Operator intervention on each component and all applicable steps)
- 1.8.2. **Penalties shall be imposed** on the Service Provider as outlined under the penalty scheme for failure to submit the **O&M manual** within a period of three (3) months of the site handover.



1.9. Green Drop Regulation Compliance

- 1.9.1. The appointed service provider **must allow costs for** and is responsible for conducting a Green Drop Assessment and ensure audit outcomes implementation on all sites while performing work on water and wastewater treatment plants, and must provide the report to the Project Leader/ Scientist/ Engineer responsible for the oversight of water and wastewater treatment plants not later than three (3) months after the date of appointment.
- 1.9.2. The Service Provider must assess factors and conditions affecting performance and compliance to the National Green Drop Certification Programme.
- 1.9.3. The assessment / process audit must be aligned with the capable plant model for Implementation of Process Performance Audit and Wastewater Risk Abatement Plan as outlined in the Department of Water and Sanitation's assessors training guidelines for the Green Drop Programme.

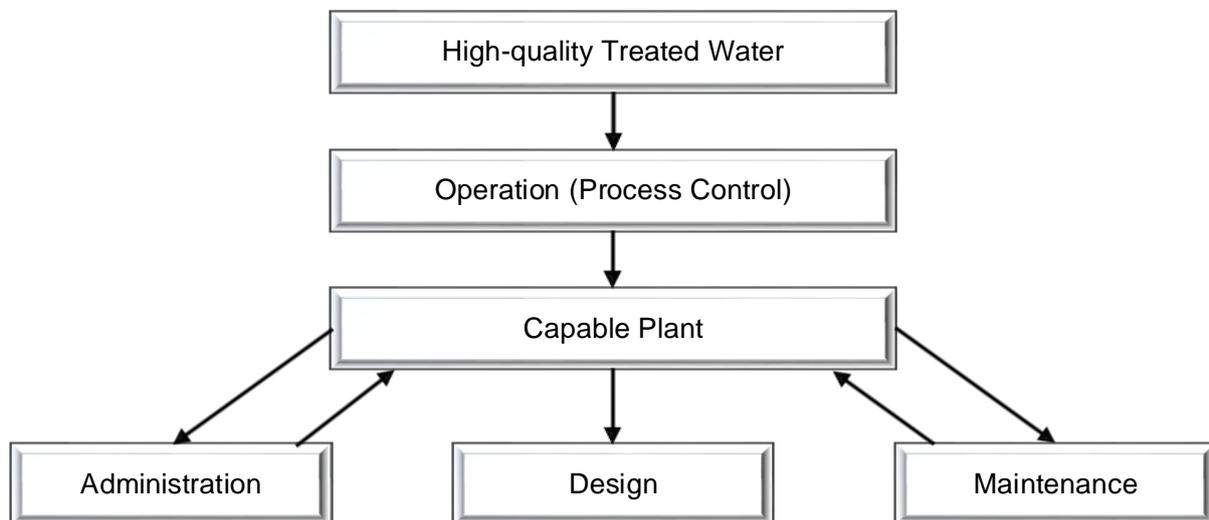


Figure 1: A Capable Plant Model

- 1.9.4. The Service Provider must improve conditions affecting the Green Drop Certification and ensure DPWI achieves the highest rating Green Drop Score. DPWI reserves the right to appoint an independent entity to conduct an assessment for comparison with that compiled and submitted by the appointed service provider. The scores to be achieved are demonstrated below:

Table 1: Green Drop Scores & Certification

Item	Rating	Condition	Appropriate Action
T.1.1.	90-100%	Excellent	Maintain via continued improvement
T.1.2.	80-89%	Good	Improve where gaps identified to shift to excellent
T.1.3.	50-79%	Average	Ample room for improvement
T.1.4.	30-49%	Poor	Need targeted intervention towards gradual sustainable improvement
T.1.5.	0-29%	Critical state	Need urgent intervention for all aspects if the wastewater services business



- 1.9.5. The service provider will be expected to develop / subscribe to the Department of Public Works and Infrastructure's approved assessment rating toolkit in order to properly assess the service provider's performance in relation to compliance on all sites.
- 1.9.6. The assessment report submitted by the service provider will be evaluated and approved by DPWI's committee for implementation. The committee will determine and grant the service provider reasonable timeframes to improve on compliance to Green Drop standards, with the expectation that all the Treatment Works should achieve **a good condition rating within a period of 12 months** from the appointment of the Service Provider.
- 1.9.7. The **Green Drop Assessment and implementation** is expected to include the following (but not limited to);
 - 1.9.7.1. Registration of wastewater treatment plants on IRIS system
 - 1.9.7.2. Registration / Licensing of wastewater treatment plants' water use
 - 1.9.7.3. Registration of process controllers and supervisors
 - 1.9.7.4. Maintenance, engineering management and scientific capacity
 - 1.9.7.5. Wastewater risk management (Wastewater risks abatement plan for each site/plant)
 - 1.9.7.6. Operational monitoring and operational records
 - 1.9.7.7. Compliance monitoring (Plant organic & hydraulic load and effluent as per applicable authorisation)
 - 1.9.7.8. Sludge classification and monitoring (including beneficiation and disposal at an authorised sludge handling site)
 - 1.9.7.9. Water samples/ laboratory credibility (Testing to be done at SANAS accredited lab only – no proficiency testing)
 - 1.9.7.10. Operations and maintenance budget
 - 1.9.7.11. Wastewater operations cost determination
 - 1.9.7.12. Wastewater treatment works design capacity management
 - 1.9.7.13. Process audit
 - 1.9.7.14. Sewer main inspection
 - 1.9.7.15. Wastewater asset management
 - 1.9.7.16. Bylaws and enforcement
 - 1.9.7.17. Monitoring data submission to Department of Water and Sanitation
 - 1.9.7.18. Effluent quality compliance
 - 1.9.7.19. Process control
 - 1.9.7.20. Stormwater management
 - 1.9.7.21. Water demand management
 - 1.9.7.22. Wastewater and sewer capital projects planned for upgrades or refurbishment
 - 1.9.7.23. Sludge reuse / Beneficiation
 - 1.9.7.24. Additional impact monitoring
- 1.9.8. **Penalties shall be imposed** on the Service Provider as outlined under the penalty scheme for failure to submit a **Green Drop Assessment Report**.



1.10. Blue Drop Regulation Compliance

- 1.10.1. The appointed service provider **must allow costs for** and is responsible for conducting a Blue Drop Assessment and ensure audit outcomes implementation on applicable site(s) while performing work on treatment plants, and must provide the report to the Project Leader/ Scientist/ Engineer responsible for the oversight of water treatment plants not later than three (3) months after the date of appointment.
- 1.10.2. The Service Provider must assess factors and conditions affecting performance and compliance to the National Blue Drop Certification Programme in order to improve drinking water management.
- 1.10.3. The Service Provider must improve conditions affecting the Blue Drop Certification and ensure DPWI achieves the lowest risk rating Blue Drop Risk Rating (BDRR) and the highest Blue Drop Score. DPWI reserves the right to appoint an independent entity to conduct an assessment for comparison with that compiled and submitted by the appointed service provider. The scores to be achieved are demonstrated below:

Table 2: Blue Drop Risk Rating

Item	Category	Risk Rating
T.2.1.	Critical risk	90-100%
T.2.2.	High risk	70-89%
T.2.3.	Medium risk	50-69%
T.2.4.	Low risk	<50%

- 1.10.4. The service provider will be expected to subscribe to the Department of Public Works and Infrastructure's approved assessment rating toolkit in order to properly assess the service provider's performance in relation to compliance on all sites.
- 1.10.5. The Blue Drop Assessment and implementation report submitted by the service provider will be assessed and approved by the National Department of Public Works and Infrastructure. The Department will determine and grant the service provider reasonable timeframes to improve on compliance to Blue Drop standards, with the expectation that all the Treatment Works should achieve a good condition rating and pose a **low risk category within a period of 9 months** from the appointment of the Service Provider.
- 1.10.6. The Blue Drop Assessment is expected to include the following (but not limited to);
- 1.10.7. Water quality compliance (Physical, Chemical and Biological);
- 1.10.8. Water quality monitoring programme (Registration of the programme on IRIS system);
- 1.10.9. Credibility of water samples / laboratory;(SANAS accredited lab testing)
- 1.10.10. Submission of water quality results to DWS and NDPWI;
- 1.10.11. Water safety planning (Water safety plan per site);



- 1.10.12. Water quality failure response (Documented official procedure);
- 1.10.13. Process control, maintenance and management skills;
- 1.10.14. Publication of potable water quality management performance (Water quality reports to End Users);
- 1.10.15. Water asset management (Assets register for all facilities);
- 1.10.16. Population determination (Population served);
- 1.10.17. Classification and capacity on IRIS system;
- 1.10.18. Water use registration/Licensing
- 1.10.19. Process Audit
- 1.10.20. **Penalties shall be imposed** on the Service Provider as outlined under the penalty scheme for failure to submit a **Blue Drop Assessment Report** within a period of three (3) months of the site handover.

1.11. Maintenance Planning: A Componentised Asset Register

The NIAMM Framework refers to maintenance planning as activities to develop Maintenance Management Plans that specify the detailed maintenance activities, resources, responsibilities, timescales and risks for the achievement of asset management objectives stated earlier. Maintenance management functions for applicable to this contract are summarised in the figure below:

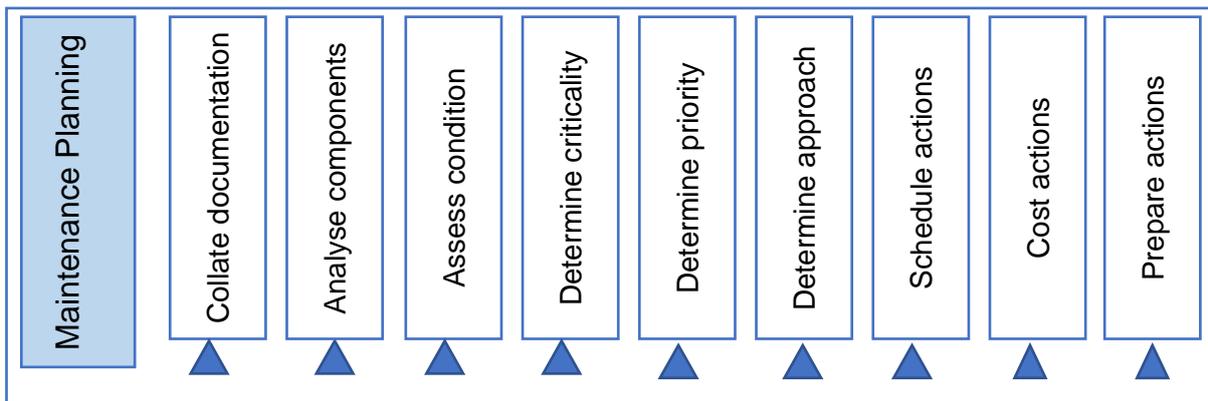


Figure 2: Maintenance Management Functions

- 1.11.1. The Service Provider **must allow costs for** and compile and maintain a geotagged componentised asset register and implement an electronic Component Identification System inclusive of respective handheld scanners for all the immovable and movable assets for respective sites, within a period of three (3) months of the site handover;
- 1.11.2. Unique component identification numbers (CINs) and tags forming part of the componentised asset register must be developed for all components and sub-components of electrical and mechanical Installations.
 - 1.11.2.1. Component Identification Numbers (CINs) / asset codes must be allocated to asset tags and be attached to (possibly be in close proximity to) respective components / subcomponents.



- 1.11.2.2. The CIN must appear in the asset register handed over to DPWI and the End User, and be allocated to each incident (complaint).
- 1.11.2.3. The CIN must be administered in collaboration with the End User and be described in the maintenance control plan as part of the componentised asset register.
- 1.11.2.4. Reference shall be made to CINs in the maintenance control plan, operating and maintenance manuals and during all maintenance activities, including the logging of breakdowns, other correspondence and on **invoices**. Identification shall also be indicated on as-built drawings.
- 1.11.2.5. Electrical, stormwater, water, wastewater and all other reticulation shall also have CINs appearing on invoices.
An example: a sewer pipe which has been replaced needs to demonstrate the length replaced and the position. A naming convention can be used in a number line format, i.e. SP01 to SP40, wherein if a portion has been replaced / work done on a 5m portion, a CIN will indicate SP16 – SP21.
- 1.11.3. The asset register must be availed in hard copies, excel format, PDF and / or any other recommended format (electronic) be componentised, fully detailed and updated on an annual basis or when new asset additions are made. It must include, but not limited to the following;
 - 1.11.3.1. Asset / equipment model and serial number;
 - 1.11.3.2. Physical description;
 - 1.11.3.3. Physical parameters;
 - 1.11.3.4. Estimated useful life in years (can be sourced from OEM);
 - 1.11.3.5. Remaining useful life in years;
 - 1.11.3.6. Actual and minimum acceptable asset failure mode ratings (condition, performance, capacity and cost-of operations);
 - 1.11.3.7. Any statutory obligations regarding the operation and maintenance of the asset;
 - 1.11.3.8. Asset criticality rating (Immediate risk and concerns and risk status)
 - 1.11.3.9. Current and estimated depreciated replacement cost (ZAR);
 - 1.11.3.10. Suggest replacement or upgrade options;
 - 1.11.3.11. Suggest energy efficient alternatives;
 - 1.11.3.12. Responsible persons.
- 1.11.4. The asset register shall be used as a basis for a condition assessment;
- 1.11.5. A condition assessment shall be used to inform the maintenance plan;
- 1.11.6. **Penalties shall be imposed** on the Service Provider as outlined under the penalty scheme for failure to submit a complete **asset register** within a period of three (3) months of the site handover.

1.12. Maintenance Planning: Facility Condition Assessment

- 1.12.1. The appointed service provider **must allow costs for** and is responsible for conducting a Facility Condition Assessment (FCA) for the building, its components and sub-components on all respective sites before and while



conducting work. The SP must provide the FCA report to the Project Leader/ Scientist/ Engineer responsible for the oversight of water and wastewater treatment plants not later than three (3) months after the date of appointment.

1.12.2. Through the FCA, the Service Provider shall assess the condition and functionality factors that make the building and its components adequate in condition and appropriate for the intended use. A FCA assists in the identification of the required maintenance, repairs and/or renewal to reinstate a facility (and its components) to their original performance level. DPWI reserves the right to appoint an independent entity to conduct an assessment for comparison with that compiled and submitted by the appointed service provider.

1.12.3. The service provider will be expected to subscribe to the Department of Public Works and Infrastructure's approved condition assessment rating (see demonstration on the below table) in order to properly assess the service provider's performance in relation to operation and maintenance on all sites.

Table 3: Condition rating scale

* Condition Rating	** Risk Grading	Criticality Description	Qualitative Description	Indicative RUL
5	1	Very good	Sound structure, well maintained. Only normal maintenance required.	71 - 100%
4	2	Good	Serves needs but minor deterioration (< 5%). Minor maintenance required	46 - 70%
3	3	Fair	Marginal, clearly evident deterioration (10-20%). Significant maintenance required.	26 - 45%
2	4	Poor	Significant deterioration of component / sub-component and/or appearance. Significant impairment of functionality (20-40%). Significant renewal / upgrade required.	11- 25%
1	5	Very poor	Unsound, failed, needs reconstruction /replacement (>50% of component / sub-component needs replacement).	0 - 10%

***Condition rating:** It is a standard practice to allocate a rating of 5 for an asset in a very good condition.

****Risk grading:** Is an inverse of the condition rating scale to determine the asset criticality

1.12.4. The outputs expected from a Facility Condition Assessment report shall include individual condition assessment reports per discipline (mechanical, electrical, civil-structural, architectural, others) comprising the following (but not limited to);

1.12.4.1. Executive summary

1.12.4.2. Methodology

1.12.4.3. For each and every problem/defect found specify:

1.12.4.3.1. Problem / defect description;

1.12.4.3.2. Problem / defect root cause;



- 1.12.4.3.3. Problem / defect location (facility, building, floor/area, room, etc.);
 - 1.12.4.3.4. Photographic evidence;
 - 1.12.4.3.5. Invasive and non-invasive tests conducted and results (where applicable);
 - 1.12.4.4. Recommendations;
 - 1.12.4.5. Conclusions.
 - 1.12.4.6. Facility Cost Estimates, including Activity Schedules for the critical areas of attention. Includes those components requiring repairs, refurbishment, replacement or renovations according to the findings from the FCA;
 - 1.12.4.7. Facility Maintenance Management Plan including lifecycle costing;
 - 1.12.4.8. Facility File comprising all the information gathered. The data should be summarised in a Facility Condition Index (FCI) that provides an objective benchmark against which DPWI can monitor changes over time.
- 1.12.5. The service provider will be expected to submit the FCA and make a presentation to DPWI's steering committee chaired by the Head of Facilities Management through the Project Leader/ Scientist/ Engineer responsible for the oversight of water and wastewater treatment plants. The FCA shall form a basis for a maintenance plan as a basis for the Service Provider to commence with the operation and maintenance on plants on respective sites.
- 1.12.6. The FCA submitted by the service provider will be assessed and approved by a Department of Public Works and Infrastructure's steering committee. The committee, chaired by the Head of Facilities Management or their delegate will determine and grant the service provider reasonable time frames to improve on the condition of assets or items listed by the service provider.
- 1.12.7. **Penalties shall be imposed** on the Service Provider as outlined under the penalty scheme for failure to submit a **Condition Assessment Report** not later than three (3) months after the site handover.

1.13. Incident Management Protocol

- 1.13.1. A service provider **must allow costs for** and is required to prepare, review, and maintain a detailed and comprehensive incident management protocol for each water and wastewater facility. The protocol must be compiled as outlined in the Department and Water Sanitation's (DWS) green drop certification. The incident management protocol should be in place within a period of one (1) month after the date of appointment of the SP and must include the following:
 - 1.13.1.1. Identify triggers, alert levels, response time required, required actions, roles and responsibilities and communication vehicles;
 - 1.13.1.2. Responses to risks identified in risk assessment;
 - 1.13.1.3. Include requirements for public water quality notices specified in relevant legislation;
 - 1.13.1.4. Development of an incident register for plant(s), supervisor(s), laboratory, and call centre (if applicable);
 - 1.13.1.5. Development of emergency incident contact details chart;



- 1.13.1.6. Procedures for accidental spillages and illegal discharge into sewers (for wastewater systems);
- 1.13.1.7. Procedures to deal with industrial effluent (for wastewater systems);
- 1.13.1.8. Clear communication protocols between all stakeholders including laboratory, plant personnel, local municipality, district municipality, and the Department of Water and Sanitation;
- 1.13.1.9. A plan including risk assessment of catchment, treatment works, reticulation, and implementation of risk assessment findings
- 1.13.1.10. Water Safety Plan process in compliance with the South African National Standards (SANS) 241;
- 1.13.1.11. Water safety planning risk assessments are conducted annually or when water quality changes. The World Health Organisation (WHO) Water Safety Planning manual is to be consulted for further information;
- 1.13.2. In facilities where an incident management protocol is already in place, the service provider will be responsible for annual amendments and updates.
- 1.13.3. **Penalties shall be imposed** on the Service Provider as outlined under the penalty scheme for **failure to implement Incident Management Protocols**.

1.14. Insurance

The service provider **must allow costs for** and is responsible to assess risks on the project and to ensure they obtain and maintain adequate insurances to cover such risks for the duration of the contract. The Service Provider shall provide comprehensive insurance and maintain during the entire period of this contract as follows:

1.14.1. Public Liability Insurance / General liability insurance

Operations, maintenance and application hazard, collapse hazard, products, completed operations, contractual, independent contractors, broad form property damage and personal injury wherein the limit of liability required under the Service Provider's **Public Liability insurance must be R 5'000'000 any one occurrence**.

1.14.2. Damage to electronic equipment and furniture, theft of materials and equipment

The Service Provider shall provide adequate insurance for the damage to electric and electronic equipment, furniture, theft of materials and equipment.

1.14.3. Government of RSA as additional insured

The general liability policy required of the Service Provider shall name "the Republic of South Africa, acting by and through the Presidency", as an additional insured with respect to operations performed under this contract.

1.15. Contractor and Local Economic Development Programme

- 1.15.1. The purpose of this section is to encourage the potential / incumbent Service Provider to incorporate principles of the National Contractor Development



Programme (NCDP) as espoused in book six (6) of the NIAMM Framework – Contractor Development in the Maintenance Industry.

1.15.2. The implementation of the principles of the NCDP for this contract is voluntary, however has a positive impact on the **incentives scheme and decision-making towards the renewal of the contract**;

1.15.3. **The objectives of the Contractor Development aligned to this contract is to:**

1.15.3.1. Increase the number of black, women, disabled and youth-owned local Small, Medium and Micro Enterprises (SMMEs) / companies;

1.15.3.2. Improve the grading status of the above companies;

1.15.3.3. Improve the performance of the above companies in terms of quality, employment practices, skills development, safety, health and the environment;

1.15.3.4. Improve business management and technical skills of the above SMMEs / companies.

1.15.4. **The following instruments are available to the Service Provider:**

1.15.3.5. Direct targeting of the local, previously disadvantaged Service Providers appointed through a fair, equitable, transparent, competitive and cost-effective process;

1.15.3.6. Indirect targeting through procurement by providing developmental support to the Joint Venture (JV) partner or sub-contractor;

1.15.3.7. Facilitating the establishment of the new start-ups through the currently contracted local employees;

1.15.3.8. Innovative developmental programmes similar to the EPWP's Vuk'uphile programme.

1.15.5. **Developmental tools for Contractor / Service Provider development;**

In order to qualify for an incentive scheme, the Service Provider must conduct an initial assessment of skills of employees / Service Provider's Construction Industry Development Board (cidb) status and end of programme audit and provide a portfolio of evidence (POE).

The table below provides a minimum guideline of the criteria for the contractor / service provider development initiative(s) comprising of Small Medium and Micro Enterprises (small businesses):



Table 4: Contractor Development Initiatives

Item	Deliverables	Purpose	Weighting	Comment
T.4.1.	Inception Report	Preliminary assessment of skills	5%	
T.4.2.	Development Implementation Plan	Plan to develop local businesses / employees	10%	
T.4.3.	Proof of recruitment and selection process	Recruitment using transparent processes in conjunction with the Local Community structures	10%	
T.4.4.	Induction and Orientation	Introducing beneficiaries to the business	5%	
T.4.5.	Registration with Construction Education & Training Authority (CETA)	Ensuring qualifications are worthy and recognisable	10%	
T.4.6.	Training Support	Provide training based on skills gap and ensure continuous improvement	10%	
T.4.7.	Mentorship and Technical Support	Enhance skills of mentees on operations and maintenance of treatment plants	15%	
T.4.8.	Implementation of enabling environment	Create time and space for the learning and skills transfer to take place	10%	
T.4.9.	*Fundraising from Developmental Funding Institutions (DFIs) ¹	Raise grants and funding on behalf of local businesses	15%	
T.4.10.	Reporting: <ul style="list-style-type: none"> ○ Monthly financial and performance progress reports ○ Quarterly reports ○ Annual reports 	Provide an ongoing portfolio of evidence, records and audit trail of the programme	5%	
T.4.11.	Close-Out Report	Summarise the project objectives, key success factors, expenditure, objectives not met, risk management, opportunities for the future programme and	5%	
Total			100%	

¹ *Capacity and understanding of Developmental Funding Institutions (DFIs) programme offerings, application procedures, and requirements to facilitate the raising of additional grant funding and other non-financial services through partnerships between the programme and the DFI's such as the Department of Small Business Development (DSBD), the Department of Trade, Industry and Competition (DTIC), Small Enterprise Development Agency (SEFA) and other similar institutions.



Part 2: Operation

2.1. Operations' registration of treatment plants and permit renewals

The Service Provider **must allow costs for** and is required to facilitate, ensure and provide evidence of registration of plants with the Department of Water and Sanitation and obtain permits, including renewal of permits prior to expiry;

2.1.1. Registration of water/ wastewater treatment facilities and permit renewals

2.2. Operations Human resources (Personnel)

The Service Provider **must allow costs for** and is required to facilitate, ensure and provide evidence of;

2.2.1. Employment, verification of qualifications and citizenship, registration & classification of all Operations Human Resources (internal & external). The required number of personnel at a specific treatment work must be based on the classification of the treatment plant as outlined in Regulation 2834 of the Water Services Act (108 of 1997). The Service Provider must familiarise themselves with the requirements of respective sites to enable provision of optimal human resources inclusive of all statutory costs (UIF, Compensation Fund, etc.), Personal Protective Equipment (PPE), profit and employee incentives comprising of, but not limited to:

2.2.1.1. Supervisor(s);

2.2.1.2. Process Controller(s) / Operators;

2.2.1.3. General Workers.

2.2.2. Information on shift patterns & personnel alternating across different sites

2.2.3. Required number & classification of staff per shift

2.2.4. During the operation of the contract, on-site staff must undergo training in the related field of practice, for example, Occupational Health and Safety training

2.2.5. Staff are to be remunerated market-related or competitive salaries

2.3. Operations Materials and consumables

2.3.1. The Service Provider **must allow costs** for and is responsible to provide SABS / SANS approved material and consumables for treatment of waste and water, disinfection, testing and ensuring compliance of treatment plants as follows:

2.3.1.1. Green Drop kits including servicing

2.3.1.2. Blue drop kits including servicing

2.3.1.3. Dissolved Oxygen meters for activated sludge plants

2.3.1.4. Sampling kit and sampling bottles

2.3.1.5. High pressure hose machine

2.3.1.6. Water and Wastewater treatment chemicals applicable to each site

2.3.1.7. Potable submersible pump



- 2.3.2. Water and Wastewater treatment chemicals: the service provider must provide sufficient chemicals specific to the requirements of each site throughout the contract period to ensure that water is treated to its best quality for consumption and discharge.
- 2.3.3. All the goods and services required at the water and wastewater treatment plants must be procured through the Service Provider's own supply chain management.
- 2.3.4. All goods purchased must have a minimum guarantee of three months, should goods malfunction within the warranty period they should be replaced at no cost to the Department.
- 2.3.5. Stocktaking and monthly usage of any consumables and tools must be conducted every month and recorded.
- 2.3.6. Goods procured by the service provider will remain the property of the Department of Public Works and Infrastructure and will be registered under the Department's asset register.
- 2.3.7. Should a service provider conduct an assessment and find it viable to procure new assets (found in the asset register such as pumps, generators, etc.), the service provider shall submit a written request to the responsible project leader for approval.
- 2.3.8. The project leader shall conduct an independent assessment with the consultation of relevant professionals with or outside the Department and are at liberty to either approve or reject the request of the service provider with stated reasons
- 2.3.9. Should a service provider procure new asset(s) in order to replace malfunctioning or malfunctioned asset(s), those assets shall be handed over to the DPWI for storage, and therefore shall not be the property of the service provider.
- 2.3.10. Should there be an unavoidable shortage in the market for critical chemicals or substances used in water and wastewater treatment, a service provider is required to consider and opt for compliant and safe alternatives available in the market.

2.4. Operations Plant, Machinery, Vehicles and Equipment

- 2.4.1. The Service Provider **must allow costs** for and is responsible to provide all commercial mechanical and electrical equipment and machinery (energy saving with low operating noise less than 85 decibels) necessary for the effective and efficient operation of the water and wastewater treatment plants and attending to grounds / horticultural services and cleaning. The Service Provider must provide sufficient machinery per site to ensure optimum provision of horticultural and cleaning services as follows:



- 2.4.1.1. Commercial brush cutters;
- 2.4.1.2. Commercial lawn mowers;
- 2.4.1.3. Commercial vacuum cleaners and blowers for plant room maintenance and personnel facilities;
- 2.4.1.4. Wheelbarrows, spades, hard brooms, hand rakes, scoop nets, skips/ grit removal bins, digging folks, (These assets will belong to the Service Provider);
- 2.4.2. The Department can, where possible, provide a space for the storage of equipment free of charge. The Department has the right to inspect at any time the provided space and at upon discretion cancel the arrangement
- 2.4.3. The operator of the machinery must be a trained person in compliance with the General Machinery Regulations, 1988 issued in terms of the Occupational Health and Safety Act, 1993.
- 2.4.4. The Service Provider **must allow costs** for and is responsible to provide vehicle(s) including fuel and drivers, not limited to as follows:
 - 2.4.4.1. Vehicle(s): 1 tonne pick-up(s) and / or trailer(s),
 - 2.4.4.2. Quad bike(s)
 - 2.4.4.3. Other (Specify:_____)

2.5. Security Provision and Security Clearance of personnel

- 2.5.1. The Service Provider and employees shall be required to undergo a security clearance before acceptance or anytime during the operation of the contract.
- 2.5.2. Service provider **must allow costs for** and is responsible to provide security services for DPWI and secure all assets under this contract including accredited physical security, uniform, incentives, statutory compliance and all requirements for personnel protection on site.
- 2.5.3. Physical Security are to control access to the sites and ensure that an attendance register/entry book is filled in.
- 2.5.4. Depending on the risk assessment conducted by the Service Provider, some sites will require 24 hour surveillance and additional security measures, e.g. security field devices while other sites will require 12 hour surveillance.
- 2.5.5. The number of security personnel and monitoring hours are subject to variation depending on the vulnerabilities of assets, offices and or accommodation
- 2.5.6. Should any assets, equipment, tools originally paid for by the Department of Public Works and Infrastructure in the previous financial year be stolen or not be found in the asset register, the service provider will be liable for the replacement of those items at no additional cost to the Department.



- 2.5.7. No exception will be made for a non-compliance with this requirement. All security officers must be at least grade “C” officers registered with the Private Security Industry Regulating Authority (PSIRA).
- 2.5.8. The service provider shall ensure that no illegal immigrants are employed by him or any sub-contractor in the execution of any part of the works and if any illegal immigrant is found to be employed, the End User shall, notwithstanding the provisions of this contract, be entitled to report / request the relevant government departments to act in terms of the Immigration Act (Act No. 13 of 2002).
- 2.5.9. Should unexpected circumstances arise (e.g. occurrence of a break-in(s) in a historically secure site), security services will be requested from the service provider at no additional cost to the Department.

2.6. Operation monitoring programme

- 2.6.1. Service provider **must allow costs for** and is responsible to provide and implement a properly designed standard operating procedure (SOP) for all operations, schematic and laminated layout including proof of operational monitoring of site(s), determinants and frequency of testing or analyses.
- 2.6.2. Samples taken at water and wastewater treatment works must be represented by:
 - 2.6.2.1. Inflow;
 - 2.6.2.2. Process flow;
 - 2.6.2.3. Outflow;
 - 2.6.2.4. Sludge.

An adequate monitoring coverage of distribution network is required.

2.7. Water/ wastewater bylaws

The Local Authority Bylaws of that particular jurisdiction must be adhered to, to address the status of the catchment and other related pollution matters and mitigation plans. Evidence of compliance must be provided by the Service Provider.

2.8. Groundwater, upstream and downstream monitoring

An environmental programme may be conducted depending on the nature of the environment. Bio-monitoring or / and boreholes assessment may be conducted or/and drilled on the receiving ends of the environment, based on geohydrology reports.

2.9. Water and Wastewater testing and Compliance monitoring programme

- 2.9.1. The Service Provider **must allow costs** for and is responsible to provide a Blue and Green drop monitoring kit comprising simple-to-use hand-held instrument, ideal for ensuring compliance with blue / green drop certification for the testing of drinking water on respective sites in accordance with industry standards (SABS / SANS) and ensure compliance as follows:



- 2.9.1.1. Testing drinking Water / portable water
- 2.9.1.1.1. Water quality monitoring must be done at all treatment plants.
- 2.9.1.1.2. Raw water (source) will be sampled quarterly and final water must be sampled once a month unless otherwise there is an emergency or plant dysfunctionality.
- 2.9.1.1.3. Onsite monitoring must be conducted daily and this will depend on process complexity and parameter demand. Onsite monitoring water quality trends and compliance graphs must be developed. These graphs must be posted on the walls in all plant offices on a monthly basis.
- 2.9.1.1.4. Water quality monitoring must be done at all boreholes and drinking water treatment plants. Processes and outcomes must comply with South African National Standards (SANS) 241 which must be consulted intensively for all requirements.
- 2.9.1.1.5. Details & proof of chemical and microbiological compliance monitoring, sampling, sampling sites, determinants [(provide figures per determinant, percentage compliance per determinant, measured against overall compliance percentage, pH, turbidity, chlorine tests, etc.)] and frequency of sampling must be provided. The number of samples taken must correlate to the number of samples to be taken per population size as stipulated in SANS 241
- 2.9.2. The Service Provider **must allow costs** for and is responsible to provide a Blue drop monitoring kit comprising simple-to-use hand-held instrument, ideal for ensuring compliance with blue drop certification for the testing of drinking water on respective sites in accordance with industry standards (SABS / SANS) and ensure compliance.
- 2.9.2.1. Testing Wastewater
- 2.9.2.1.1. Wastewater quality monitoring must be done at all plants.
- 2.9.2.1.2. Raw sewage sample must be taken quarterly and final effluent must be sampled once a month unless there is an emergency or plant dysfunctionality.
- 2.9.2.1.3. Onsite monitoring must be conducted daily and this will depend on process complexity and parameter demands. Onsite monitoring of water quality trends and compliance graphs must be developed. These graphs must be posted on the walls in all plant offices on a monthly basis.
- 2.9.3. The service provider is to ensure that wastewater treatment works under the custodianship of the Department of Public Works and Infrastructure receive excellent ratings for green drop assessments, exhibiting exceptional physical, chemical and microbiological compliance.
- 2.9.4. The service provider will be required to consistently ensure physical, chemical and microbiological compliance. Only chemicals approved by the South African Bureau of Standards (SABS) / SANS are to be purchased and used.



- 2.9.5. The discharge standards specified in the General Authorisation (No. 339) of March 2004 must be used as wastewater discharge standards. General or special standards applicable to a particular wastewater treatment works must always be adhered to. Documented design capacity of water/ wastewater treatment work and documented daily operating capacity over an annual basis (12 months). The Department of Water and Sanitation Blue and Green Drop criteria must be consulted for detailed compliance requirements.
- 2.9.6. Any spillages from the treatment plant that endanger human and animal health as well as the environment are to be addressed urgently by the service provider, should the matter not be dealt with promptly, the Department of Public Works and Infrastructure is at liberty to fine the service provider or to impose a payment reduction.

2.10. Sample analyses submission and credibility

The following information is to be disclosed or submitted by the service provider;

- 2.10.1. The name of the laboratory used for analyses;
- 2.10.2. Evidence from the laboratory of choice should be accredited with the South African National Accreditation System (SANAS);
- 2.10.3. Proof indicating turn-around time allows for proper process control, including but not limited to storage of laboratory samples in a cooler box and analysed within a space of 24 hours, separation of sterilized bottles for microbial analyses (E.coli), collection of grab samples at proper sampling points where there are sampling signs.
- 2.10.4. The laboratory results must be sent to the Department of Public Works and Infrastructure before the 15th of each month.

2.11. Water results quality management, submission and publication

The Service Provider **must allow costs** for and is responsible to implement a water quality monitoring programme, reporting, uploading on the IRIS, benchmarking and publishing of results as follows:

- 2.11.1. Compile a water quality monitoring programme with recommendations for approval by Department of Public Works and Infrastructure;
- 2.11.2. Design, recommend and implement a format for reporting and publication of information to End Users on drinking water issues;
- 2.11.3. Maintain and upload the laboratory results on the system [Integrated Regulatory Information System (IRIS)] every month
- 2.11.4. Submit the laboratory results to the Department of Public Works and Infrastructure on a monthly basis in order for the Department to assess adherence to compliance by the service provider;



- 2.11.5. Provide a quarterly assessment toolkit to assist the Department of Public Works and Infrastructure with management against baseline and progress thereof towards full compliance, with attached proof of laboratory results over the period in question;
- 2.11.6. Publish annually, water / wastewater quality performance in adherence to South African National Standards (SANS) 241: 2015 (or latest amendment) and wastewater discharge standards respectively;
- 2.11.7. Submit a copy of the publication as evidence to the Department of Public Works;
- 2.11.8. Conduct a water services audit on an annual basis.

2.12. Performance measurement of Plants

A service provider shall be compliant with the Green and Blue Drop certificate programme of the Department of Water and Sanitation at all times.

- 2.12.1. Should the service provider be found to be non-compliant in any area of their respective responsibility, the Department of Public Works and Infrastructure is at liberty to fine the service provider or to impose a payment reduction.
- 2.12.2. Should End Users be dissatisfied with the smell or taste, etc. of potable water as relates to water quality standards, the service provider must alter the chemicals used which result in organoleptic displeasure provided there is reasonable grounds to do so.
- 2.12.3. The service provider is to submit a written report on the matter to the Department of Public Works and Infrastructure and rectify the use of chemicals within a period of a week after the service provider, a representative of the End Users, and an official of the Department have met for discussions on the topic.
- 2.12.4. Should the service provider found to be non-compliant, the project leader will issue a written complaint and the service provider will be provided with 21 working days to rectify the issue. Should the issue be found to persist after 21 days has lapsed, the project leader will issue a final warning. Should successive 21 days lapse after the written warning and the issue has not been rectified, a fine or penalty will be imposed on the service provider.
- 2.12.5. **Penalties shall be imposed** on the Service Provider as outlined under the penalty scheme for failure to **maintain a good / excellent performance of plants**.



Part 3: Maintenance

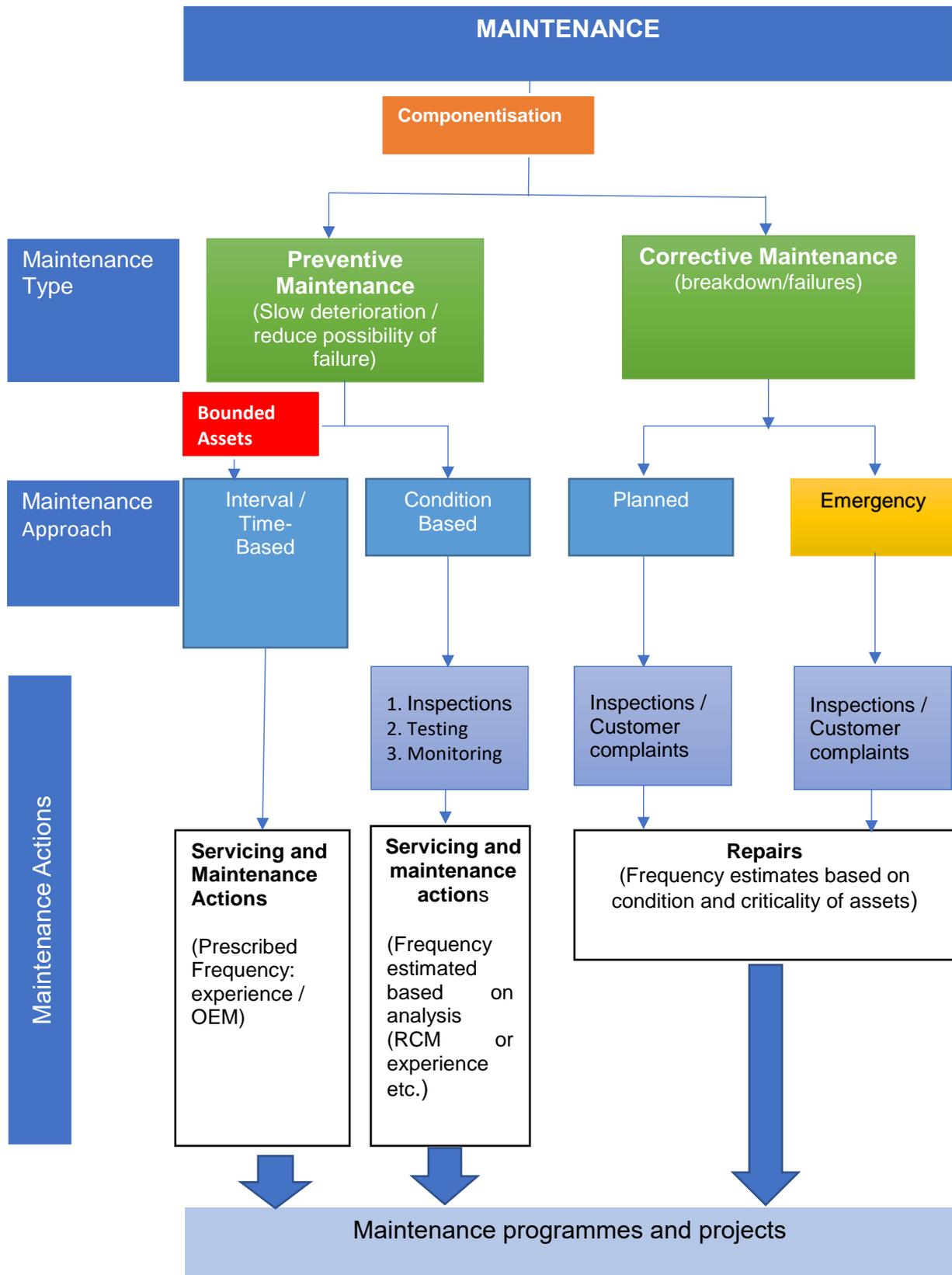


Figure 3: Maintenance Hierarchy

3.1. Principles and responsibility of Plant Maintenance

- 3.1.1. Maintenance shall as part of Asset Care, include preventative maintenance and corrective maintenance (breakdown) of complete installations (see the figure above on maintenance hierarchy).
- 3.1.2. As a principle the type of maintenance and the approach to maintenance is determined by component type, rather than for each component individually, unless there are specific unique requirements stated by the original equipment manufacturer (OEM).
- 3.1.3. The Service Provider is responsible for the maintenance of the components/ systems / complete installations including their subcomponents. Services and/or parts of the buildings and infrastructure shall all be complete installations shall be maintained to ensure reliable functioning and optimum service life thereof.

An example: maintenance of a power generator set (a component), shall include sub-components (engine and alternator) and comprise of replacement of filters, oil change, maintenance of alternator, electrical boards, etc., to ensure the generator set can function as a unit.

- 3.1.4. Treatment Plants shall be continuously operational and water supply systems shall be fully operational twenty-four (24) hours a day, seven (7) days a week unless a statutory / scheduled maintenance activity is being carried out.
- 3.1.5. The Service Provider shall ensure the general condition of all installations is in a good serviceable and optimal operating condition throughout the duration of the contract. The Service Provider shall, as part of demobilisation provide a close-out report, including the condition of each component.

3.1.6. Maintenance records and reports

- 3.1.6.1. The Service Provider **must allow costs for** and is responsible to provide and maintain hard-cover A4 maintenance files and excel electronic records for each installation for the duration of the Contract. All schedules, checklists, breakdown reports, preventative maintenance records, component replacement records and quarterly reports shall be filed and provided to the Project Leader/ Scientist/ Engineer.
- 3.1.6.2. Site maintenance records shall be electronically submitted prior to a monthly meeting and hard copies provided in the monthly meeting.

3.1.7. Maintenance Communication

The Service Provider **must allow costs for** and is responsible to provide a communication and complaint logging procedure as part of the maintenance control plan. The following requirement for maintenance communication apply;



- 3.1.7.1. The Service Provider shall establish a telephone, email and a cellular phone connection to ensure that he can be reached at any time.
- 3.1.7.2. The Service Provider shall primarily be responsible for determining the items requiring preventative and corrective maintenance, and shall communicate this information directly to his maintenance workforce.
- 3.1.7.3. Should the Project Leader/ Scientist/ Engineer or operating personnel of the End User determine or suspect that preventative, corrective or breakdown maintenance is required, a call shall be logged through the call centre to reach the Service Provider as soon as possible.
- 3.1.7.4. Mandatory response times are indicated further in the table below.
- 3.1.7.5. All complaints of the End User shall be reported to the Project Leader/ Scientist/ Engineer via the DPWI call centre, as set out in the maintenance control plan and the Project Leader/ Scientist/ Engineer shall issue written instructions to the Service Provider.
- 3.1.7.6. The breakdown registration / completion certificate form will be completed and send to the DPWI representative.
- 3.1.7.7. The Service Provider shall provide a quotation for maintenance work items to be executed and receive approval from the Project Leader/ Scientist/ Engineer.
- 3.1.7.8. Work executed without the approval of the Project Leader/ Scientist/ Engineer shall be on the account of the Service Provider.
- 3.1.8. Maintenance Control Plan**
 - 3.1.8.1. The Service Provider is responsible for and **must allow costs for** the development and implementation of the maintenance control plan and must include the component / subcomponent, the area of installation, the frequency of routine maintenance / inspections and format of reports.
 - 3.1.8.2. The Service Provider shall, as part of maintenance responsibilities repair or replace faulty equipment upon logging of a breakdown within the down-time. The Service Provider shall not claim additional establishment costs. The Service Provider shall rectify any faulty condition of which he becomes aware if it has no cost implication, even if it has not been logged. Such rectification shall also be logged and listed in the quarterly report.
 - 3.1.8.3. maintenance quality control as part of the maintenance control plan to assist in ensuring that preventative and corrective maintenance are performed as described in the operating and maintenance manuals / as statutorily required.
 - 3.1.8.4. **Special testing of an installation:-**
 - 3.1.8.4.1. The Project Leader/ Scientist/ Engineer may at any time inspect any part of the entire installation. During maintenance work, the Project Leader/ Scientist/ Engineer shall at his discretion order special tests to be carried

out on complete installations at intervals of not less than four months, to verify the satisfactory functional condition of the installation.

- 3.1.8.4.2. The Project Leader/ Scientist/ Engineer reserves the right to select at random component equipment and trade practices to be tested by independent authorities for compliance with specifications as specified in this Contract document.
- 3.1.8.4.3. The Service Provider shall provide all equipment, tools and instruments required for testing.
- 3.1.8.5. Maximum maintenance down-time:-
- 3.1.8.5.1. The Service Provider shall be expected to minimise the maintenance down-time until the system component is fully operational to the satisfaction of the Project Leader/ Scientist/ Engineer. Should the Service Provider not respond within the maximum down-time, the Project Leader/ Scientist/ Engineer may arrange, at the cost of the Service Provider, for the necessary repair work to be done by others
- 3.1.8.5.2. The Service Provider shall respond to a breakdown registration by travelling to Site to evaluate the breakdown (scope of repair work), estimate the realistic downtime and provide feedback to the Project Leader/ Scientist/ Engineer.
- 3.1.8.5.3. Should breakdown time coincide with / be closer to a scheduled maintenance time, maintenance shall be combined and optimised to reduce travelling and labour costs. DPWI reserves the right to deduct maintenance and or labour costs deemed wasteful as a result.
- 3.1.8.5.4. Should the Service Provider not be able to complete the required repair work within the maximum down-time period allowed, it shall be his responsibility to obtain extension of down-time from the Project Leader/ Scientist/ Engineer. The written report shall clearly state the reasons for the extension, as well as the actual extension required.
- 3.1.8.5.5. Extension of down-time will only be granted by the Project Leader/ Scientist/ Engineer If:
- 3.1.8.5.5.1. The maximum down-time is deemed unreasonable in relation to the scope of the repair work required;
- 3.1.8.5.5.2. The delivery time of a new component / subassembly/ machine or spaces required for the repair of the defective component/ subassembly does not enable the Service Provider to successfully complete the repair work within the maximum breakdown down-time allowed.
- 3.1.8.5.6. Should the actual down-time exceed the maximum down-time the Service Provider shall be liable to a payment reduction for the difference between actual down-time and maximum down-time. This is reflected in the table below:

Table 5: Response times on maintenance

Item	Required maintenance	Maximum down-time allowed	Payment reduction if exceeded
T.5.1.	Fatal Breakdown (where specified)	Zero (Immediate Response)	R 2500/hour
T.5.2.	Emergency Breakdown	24 hours	R 2500/day
T.5.3.	Ordinary Breakdown	5 days	R500/day
T.5.4.	Operational damage repair	5 days	R500/day

3.2. Preventative Maintenance

3.2.1. Preventative (preventive) maintenance, for the purpose of this contract shall comprise of:

- 3.2.1.1. Condition-based maintenance (CBM);
- 3.2.1.2. Routine maintenance (RM);
- 3.2.1.3. Interval based (IB)

3.2.2. Condition-Based Maintenance (CBM)

- 3.2.2.1. CBM is part of predictive maintenance and monitors the actual condition of the assets via inspections, testing and monitoring to determine maintenance to be done before failure;
- 3.2.2.2. Implementation of CBM reduces corrective maintenance (breakdowns) – it is therefore expected that equipment failures / breakdowns during the contract will be minimised to 10% - 30% of the total maintenance;
- 3.2.2.3. Telemetry equipment, equipment sensors, visual inspections, non-invasive measurements, etc., provide condition data to determine maintenance to mission critical and non-mission critical assets in order of priority. Minor works improvements providing a benefit by reducing operating costs, providing early warning systems, reducing energy, increasing plant operational and water efficiency, etc., should be motivated for installation on a cost benefit analysis scale for possible approval by DPWI through the Project Leader/ Scientist/ Engineer;
- 3.2.2.4. Facility Condition Assessment (FCA) / Condition Assessment reports of components should be accompanied by detailed cost analyses for conversion to quotations and must be used to determine and implement CBM;
- 3.2.2.5. All CBM identified at the beginning of the contract must be completed not later than six (6) months and invoiced within eight (8) months after the date of appointment of SP;

- 3.2.2.6. The Service Provider must appoint a maintenance manager with requisite trade qualifications and track record in management of treatment plant maintenance, a Millwright and an Electrician (with trade certificates), including skilled and semi-skilled personnel (with certificates), to ensure the majority of condition-based maintenance and oversee routine maintenance throughout the duration of the contract;
- 3.2.2.7. Residual CBM shall be performed by specialised maintenance contractors;
- 3.2.2.8. The Service Provider **must allow costs for** and is responsible to execute and / or facilitate **CBM** by providing **material** inclusive of profit and attendance as part of detailed invoice claims, providing copies of suppliers purchase invoice as follows;
- 3.2.2.8.1. Condition-based material (Provisional);
- 3.2.2.9. The Service Provider **must allow costs for** and is responsible to execute and / or facilitate **Condition Based Maintenance** and as shared services for interval-based maintenance, provide **labour** with trade test qualifications for skilled personnel inclusive of all statutory costs, Personal Protective Equipment (PPE), profit and attendance and employee incentives throughout the duration of the contract as follows;
- 3.2.2.9.1. Maintenance Manager;
- 3.2.2.9.2. Millwright;
- 3.2.2.9.3. Electrician;
- 3.2.2.9.4. Semi-skilled;
- 3.2.2.9.5. General worker
- 3.2.2.9.6. Other (Specify:_____)

**** Personnel for CBE shall also provide maintenance shared-services for interval-based maintenance and mentoring of EPWP personnel;**

- 3.2.2.10. The Service Provider **must allow costs for** and is responsible to execute and / or facilitate **CBM** by providing **specialised sub-contractors** for specialised maintenance inclusive of attendance for maintenance (profit) and as part of detailed invoice claims, providing copies of suppliers purchase invoice as follows;
- 3.2.2.10.1. Specialised sub-contractor services for CBM (Provisional);
- 3.2.2.10.2. Profit and attendance of specialised services for CBM (%);
- 3.2.2.11. The Service Provider **must allow costs for** and is responsible to execute and / or facilitate **CBM** by providing **specialised equipment** hire and tools. The Service Provider shall provide a comparative quotation from reputable equipment hiring companies where equipment is owned by their firm / company – claims shall only be restricted to equipment hire only in this case. A detailed invoice for equipment hire inclusive of attendance for maintenance (profit) / ownership use must be submitted with a hire company invoice / comparative quotation as follows;

- 3.2.2.11.1. Equipment hire for CBM (Provisional);
- 3.2.2.11.2. Profit and attendance of equipment hire for CBM (%);

3.2.3. Routine and interval-based maintenance (RIM)

- 3.2.3.1. Routine and interval-based maintenance are combined in this section to optimise the maintenance of the installations, systems and equipment;
- 3.2.3.2. The majority of routine maintenance identified from the O&M manual's daily tasks checklists should be secured for EPWP beneficiaries and the local labour employment;
- 3.2.3.3. The Service Provider **must allow costs for** and is responsible to execute and / or facilitate **RIM** by providing **material** inclusive of profit and as part of detailed invoice claims, providing copies of suppliers purchase invoice where rates of material were not provided and agreed on prior to the contract as follows;
 - 3.2.3.3.1. Fire protection system (Fire extinguishers, hoses, hydrants, sprinklers, & detection where applicable);
 - 3.2.3.3.2. Main water network
 - 3.2.3.3.3. Spares and lubricants for electromechanical equipment (Service Provider to submit as comprehensive a list as possible with cost estimates prior to the award of the contract OR within a month of the award of the contract for management of contract – Sum);
 - 3.2.3.3.4. Material for infrastructure (Sum);
 - 3.2.3.3.5. Material for grounds (Sum).
- 3.2.3.4. The Service Provider **must allow costs for** and is responsible to execute and / or facilitate **RIM** by providing **labour** inclusive for maintenance of components (building structures, plant, equipment and grounds) and all statutory costs, Personal Protective Equipment (PPE), profit and employee incentives throughout the duration of the contract as follows;
 - 3.2.3.4.1. EPWP Supervision (costing under EPWP);
 - 3.2.3.4.2. Groundsmen;
 - 3.2.3.4.3. General worker (costing under CBM);
 - 3.2.3.4.4. Other (Specify:_____)
- 3.2.3.5. The Service Provider **must allow costs for** and is responsible to execute and / or facilitate **RIM** by providing **servicing and control of electromechanical equipment** and tools.
 - 3.2.3.5.1. Servicing and control of electromechanical equipment (Sum);
- 3.2.3.6. Routine and Interval-based (**RIM**) maintenance work shall be based on the O&M Manual as some of the tasks to be performed and executed shall include, but not be limited to the items listed below. The tendered rate shall include full compensation for all material, plant and labour required in order to perform such maintenance to the satisfaction of the Project Leader/ Scientist/ Engineer:

Table 6: Repair of water distribution pipe

	Routine Preventative Maintenance item description	Maintenance Frequency
T.6.1.	Visually inspect and report on complete system	Monthly
T.6.2.	Log all water meter readings	Monthly
T.6.3.	Log all pressure gauge readings	Monthly
T.6.4.	Check, inspect, report and repair leaks/replace rotten pipes where required	Monthly
T.6.5.	Sample water supply and chemical analyses to be provided by approved company	Monthly
T.6.6.	Water storage tanks to be emptied, cleaned out, inspected, repaired and resealed where necessary	Annually
T.6.7.	Clean out all strainers	Monthly
T.6.8.	Check, inspect, repair or replace all bracketing systems.	Four monthly
T.6.9.	Paint repairs to piping, fitting and equipment	Annually

Table 7: Repair of existing pipes

No.	Routine Preventative Maintenance item description	Maintenance Frequency
T.7.1.	Visually inspect and report on complete system	Monthly
T.7.2.	Remove slit, debris and loose lime deposits from within pipelines where required by scouring	Annually
T.7.3.	Do general cleaning in areas where leakage has occurred	Six Monthly

Table 8: Repair of existing fittings

No.	Routine Preventative Maintenance item description	Maintenance Frequency
T.8.1.	Replace all valve gaskets, gland packings and seals	Annually
T.8.2.	Check, inspect, service, repair, and readjust all pressure reducing valves	Annually
T.8.3.	Check, inspect and test operation of all valves on site	Every four months
T.8.4.	Check, inspect, service, test, and repair/replace all safety and expansion release valves	Every six months
T.8.5.	Check, inspect, service, test, and repair/replace all air release valves and vacuum breakers	Every four months
T.8.6.	Check, service, repair or replace all ball float valves	Every six months
T.8.7.	Check, inspect, test, service, and repair/replace all non-return valves	Every four months

Table 9: Repair of existing structures

Item	Routine Preventative Maintenance item description	Maintenance Freq.
T.9.1.	Visually inspect and report on all water related distribution structures	Monthly
T.9.2.	Clean out structures of debris	Every six months

Table 10: Clear water pump

Item	Routine Preventative Maintenance item description	Maintenance Freq.
T.10.1.	Visually inspect and report on complete system	Monthly
T.10.2.	Check, service, repair, and clean all pumps	Every six months
T.10.3.	Corrosion protect pumps, motors, and surface piping	Once per contract
T.10.4.	Check, inspect, report, and repair all leaks	Monthly
T.10.5.	Check and lubricate moving parts	Every four months

Table 11: Main Sewers

Item	Routine Preventative Maintenance item description	Maintenance Freq.
T.11.1.	Visually inspect and report on complete installation	Monthly
T.11.2.	Check, inspect, repair, or replace all manhole covers and frames and builder's work to manholes	Every four months
T.11.3.	Check, inspect, and repair manhole benching	Every four months
T.11.4.	Check, inspect, repair, or replace all inspection eye, end caps, and cleaning eye covers	Every four months
T.11.5.	Check, inspect, report, and unblock any blockage that occurs.	Monthly
T.11.6.	Check, inspect, repair, or replace, and clean out all equipment traps	Monthly
T.11.7.	Paint repairs to surface piping and equipment	Annually
T.11.8.	Survey and resultant repairs and unblocking off all main sewer lines	Annually
T.11.9.	Check, inspect, repair, or replace sewer pipes where necessary to always maintain good working condition	Every four months

3.2.3.7. Inlet works

The routine maintenance work to be performed and executed shall include, but not limited to the items listed in table below.

These actions and findings shall be logged and reported on the relevant approved schedules and reports.

Table 12: Inlet works

Item	Routine Preventative Maintenance item description	Maintenance Frequency
T.12.1.	Check, repair, or service drum screen and press	Every four Months
T.12.2.	Clean flow rate measurement device	Monthly
T.12.3.	Calibrate flow rate measurement device and provide a calibration certificate	Annually

3.2.3.8. Flow rate measurement

The Service Provider shall be responsible for the proper performance of flow measurement devices.

3.2.3.8.1. To ensure a perfect functional condition, the flow measuring devices shall be cleaned monthly and calibrated annually;

3.2.3.8.2. The measuring device shall be calibrated regularly by a manufacturer's representative according to his specification;

3.2.3.8.3. Apart from regular calibration, the Service Provider shall keep records of flow measurements to establish base line data that will be used for future monitoring and periodic maintenance calibration;

3.2.3.8.4. In case of flow measuring device failure, the service provider must implement alternative ways to measure flow and keep records.

3.2.3.9. Pumping Equipment

3.2.3.9.1. All wastewater pumping equipment and systems shall be serviced and repaired, to maintain it in perfect functional condition. Maintenance shall be carried out and shall include RIM according to the manufacturer's specification to be set out in the operating and maintenance manual, CBM as ascertained from the Condition Assessment, as well as Corrective maintenance work or replacement.

3.2.3.9.2. The RIM work to be carried out shall include, but not limited to the items listed on the table below;

Table 13: Pumping Equipment

Item	Routine Preventative Maintenance item description	Maintenance Frequency
T.13.1.	Check oil level and presence of water in oil	After first 20 running hours. Thereafter every 6 months or 500 running hours, whichever comes first
T.13.2.	Replace oil	Annually, or if no longer transparent
T.13.3.	Refresh grease in main bearing	Every 10 000 running hours
T.13.4.	Check cable entry into pump for leakage	Quarterly
T.13.5.	Remove inspection plug to check for response of water in motor housing	Quarterly

These actions and findings shall be logged on the relevant approved schedules and reports.

3.2.3.10. Aerators

Maintenance shall include:

3.2.3.10.1. Replacing of components, equipment, or material.

3.2.3.10.2. Routine checking of aerators and timers to maintain dissolved oxygen levels.

- 3.2.3.10.3. Servicing of bearings, gearboxes, and motors.
- 3.2.3.10.4. Aerator shafts and discs.
- 3.2.3.10.5. General corrosion protection.
- 3.2.3.10.6. Check all electrical switchgear and connections.
- 3.2.3.10.7. Cleaning outflow channels, drainpipe work, bypass pipe work, inspection manholes, collection chambers, and all other hydraulic structures and units.
- 3.2.3.10.8. Supernatant return from the sludge lagoon daily and maintain the return pump system.
- 3.2.3.10.9. Maintain adjustable overflow weirs in biological reactors.
- 3.2.3.10.10. Maintain waste activated sludge system
- 3.2.3.10.11. Maintain cat walks and ladders in a safe and serviceable condition.
- 3.2.3.10.12. Maintain sludge return system on ensure continuous sludge return at the correct ratio.

3.2.3.11. Sludge Treatment and Disposal

The following specific requirements shall form part of the maintenance responsibilities but shall not be limited to the scope or content of the work and responsibilities.

3.2.3.12. Anaerobic sludge digestion

Anaerobic sludge digestion depends on the process microbiology to convert a mixture of sludge into various end products that include methane (CH₄) and carbon dioxide (CO₂). The process can be described as three biochemical steps:

- 3.2.3.12.1. Hydrolysis involves enzyme-mediated transformation of high-molecular mass compounds suitable for use as a source of energy and cell carbon.
- 3.2.3.12.2. Acidogenesis involves bacterial conversion of compounds, transformed in the first reaction, into organic fatty acids and alcohols (such a methanol) and other intermediate compounds that are more readily digested by the End Users.
- 3.2.3.12.3. Methanogenesis involves bacterial conversion of intermediate compounds to methane and carbon dioxide.

To maintain the process briefly described above, the “acid production stage” must not proceed faster than the gas (methane) production stage. Causing the pH drop. Although methanogenic bacteria convert acids, they cannot function in an environment with a pH of less than 6,2. The pH of the water/sludge mixture in the digester must be maintained as close as possible to natural (pH = 7,0). Values outside the range of 6,6 < pH < 7,6 will not be acceptable. Alkalinity in the form of hydrated lime, Ca(OH)₂ may be used in anaerobic digesters to maintain a pH equal to 7.

3.2.3.13. Sludge mixing mechanism

Mixing of the contents of the digesters shall be aimed at increasing the rate of sludge stabilisation, preventing cementing of sludge against the digester walls and bottom, and breaking up of scum layers. Digester sludge shall be released to flow into the raw

sludge pump system and back into the digester for a continuous period of eight hours twice a week, preferably on Fridays and Tuesdays.

3.2.3.14. Digested sludge withdrawal

Digested sludge shall be withdrawn daily according to the amount of raw sludge and humus added to the digester.

3.2.3.15. Supernatant liquor withdrawal

3.2.3.15.1. Supernatant liquor separates from digesting sludge during periods of no mixing. Supernatant liquor shall be withdrawn immediately prior to commencement of the mixing process.

3.2.3.15.2. Supernatant liquor shall be withdrawn by first opening the valve of the topmost withdrawal line. On withdrawing all liquor above the outlet level to the topmost line, the valve on the centre line shall be opened. On withdrawing all liquor above the outlet level to the centre line, the valve on the bottommost line shall be opened.

3.2.3.15.3. Opened valves shall be closed if, instead if supernatant liquor, sludge starts flowing out.

3.2.3.16. Sludge (waste) management plan

A service provider is required to develop and deal with sludge handling and management in all wastewater treatment works. To consult the nearby farmers on sludge handling and disposal. Develop a best practice on the safe and beneficial re-use of sludge. Dried sludge is to be removed once a month from sludge beds. Sludge is to be tested to be deemed safe for re-use in compost or fertilizer, etc. Water Research Commission (WRC) guidelines for the utilisation and disposal of wastewater sludge may be consulted for detailed sludge management procedures.

A sludge bed shall be filled with sludge for a period of a month. After that the sludge shall be left for three months to dewater. Dried sludge shall be removed every month from one of the sludge drying beds.

Sludge shall be removed once a month by a Service Provider either to:

3.2.3.16.1. The composting grounds, to be mixed with fertiliser, etc. or

3.2.3.16.2. A commercial dumping site suited for sludge disposal.

Maintenance responsibilities shall include:

3.2.3.16.3. Replacing the of dysfunctional components, equipment, or material

3.2.3.16.4. Digester sludge mixing according to prescription

3.2.3.16.5. Digested sludge withdrawal to sludge drying beds according to mixed sludge (raw sludge, humus, scum) production and intake

3.2.3.16.6. Supernatant liquor withdrawal

3.2.3.16.7. Maintaining a natural pH in the digester sludge

3.2.3.16.8. Removing dried sludge and disposal at location approved by Project Leader/ Scientist/ Engineer

- 3.2.3.16.9. Corrosion protection of all components of the sludge treatment system.
- 3.2.3.16.10. Any other work and rectifying measures necessary to maintain an anaerobic sludge treatment process and the dewatering of digested sludge.

3.2.3.17. Maturation Ponds

Maintenance of maturation ponds shall include all work necessary to maintain water quality about aquatic growths. Aquatic growths shall be removed manually and despised of with dried sludge. Maturation pond outlet structures, weirs, and emergency outlets, as well as all pipework and channels interconnecting ponds and other units (such as sedimentation tank inlet pipes or effluent recycle outlet channels) shall be maintained clean, neat and in a perfect functional condition. The regular cleaning of the surface of the ponds and removal of artificial solids form part of the maintenance work.

3.2.3.18. Valves and Sluice gates

Maintenance shall include all repair work, replacing of components, fixing leaks, routine setting (of flow rates etc.), corrosion protection, and all other necessary to maintain valves and sluice gates in a perfect functional condition.

3.2.3.19. Cleaning, servicing and desilting of water tanks / reservoirs

Tanks / reservoirs shall be annually desilted to increase holding capacity and remove accumulated organic, non-organic material and nutrients providing growing conditions for aquatic weeds and algae. The removed silt should be tested for viability of use and beneficiation in agricultural use owing to minerals in it. Maintenance shall include all repair work, replacing of components, fixing leaks, etc.

3.2.3.20. Drinking Water Processes

3.2.3.20.1. Raw Water Abstraction / Raw Water Intake

3.2.3.20.1.1. As part of operations and maintenance, the service provider must allow costs to ensure no water loss occurs between the point of water abstraction to the water care facility. The Service Provider shall be open to engage with the officials of the Department of Public Works & Infrastructure, Water & Sanitation and Environment, Forestry & Fisheries on water resource management plans in order to ensure the sustainable use of water to avoid water abstraction depleting water from the environment faster than the environment may recover.

3.2.3.20.1.2. The following equipment must be maintained and cleaned according to stipulated guidelines (not limited to); raw water pumps, conveyance system (e.g. canal), flow meters, screens, etc.

3.2.3.20.1.3. Water pollution which poses a serious threat to public health and aquatic life such as oil spillages are to be reported to the relevant authorities immediately in line with the Incident Management Protocol.

3.2.3.20.2. Raw Water Storage

The service provider shall ensure that the area where raw water is stored is maintained, kept clean and any noticeable pollution is removed from the area.

3.2.3.20.3. Coagulation

3.2.3.20.3.1. In order to ensure coagulants are mixed into the water during treatment, mixers must be operational and maintained as per manufacturer's guidelines, and assessed for mechanical and power failures that may occur and resolved accordingly.

3.2.3.20.3.2. A variety of chemicals as listed below maybe used to achieve coagulation during water treatment (in as far as the chemicals used are approved by the SABS) and must be used in appropriate amounts (correct dosing) in relation to the raw water source to ensure excellent water quality and public health safety;

- (a) Aluminium sulphate
- (b) Aluminium polymers
- (c) Ferric chloride
- (d) Flocculation aids
- (e) Hydrated lime
- (f) Polymeric coagulants

3.2.3.20.4. Sedimentation

3.2.3.20.4.1. The service provider must ensure an even inflow, distribution of flocculated water into tanks, observe flows and the nature of flocs. If it is evident that a flow distribution problem exists, the service provider must investigate possible causes such as blockages in channels or inlet pipes and clean as necessary.

3.2.3.20.4.2. The service provider must allow costs for scraping mechanisms and moving bridges to function properly, where maintenance is carried out according to schedule to ensure proper functioning. Regular visual inspections are a requirement to detect possible mechanical problems.

3.2.3.20.4.3. If mechanical problems occur, the equipment must be stopped and maintenance staff called in to maintain promptly. Sludge must be pumped regularly from the tank according to operating instructions. If sludge is left too long in the tank, it may become too thick and cause pump problems. Alternatively, settled sludge may be entrained and cause a deterioration in settled water quality. If sludge is pumped too



frequently, the sludge may become very thin, resulting in high water losses and rapid filling of sludge dams or lagoons.

3.2.3.20.4.4. The sides and overflow weirs of the sedimentation tanks must be kept free from algal and other growths by regular brushing and cleaning as algal growths may cause taste and odour problems. The turbidity of the overflow from each tank must be determined on a regular basis. If the turbidity exceeds set values, the cause for poor performance must be determined and corrective action taken.

3.2.3.20.4.5. Possible causes such as an increase in inflow, increased production or problems with flow distribution between tanks must be determined and rectified immediately. In case of poor performance in sedimentation tanks, the service provider will be required to check inflow volume, calculate upflow velocity, check inflow distribution, coagulation, flocculation and correct where necessary.

3.2.3.20.5. Filtration

3.2.3.20.5.1. In order to ensure optimised filtration, coagulation and flocculation pre-treatments must be efficient. Filters are to be used for the calculated/recommended and/or specified duration of time. The service provider will be expected to monitor individual outlets of all the filters to ensure filters are contributing to a high water quality standard in order to identify any problem filters. The manual sampling of filters (by testing for turbidity) should be every two hours to establish an understanding of filter performance. Flow rates are to be monitored and recorded for traceability.

3.2.3.20.5.2. The service provider will be expected to maintain backwashing pumps and their respective flow rates with a backwash flow meter as stipulated by guidelines outlined in this document. A filter that has been taken out of operation should be washed immediately after removal. Whenever a filter run is interrupted, it must be backwashed before it is placed back into service. This is to prevent the decomposition of the specific deposit which may lead to unwanted odour and taste.

3.2.3.20.5.3. When a filter is taken out of service for media sampling or other testing, the tests must be performed as soon as possible and the filter must be washed immediately after the tests have been performed. For a filter that is out of service for a short period or a few days, the general rule is that the water level in the filter basin must remain approximately 100 mm above the media surface. The media should not be exposed and allowed to dry out, unless called for by tests that have to be performed.

3.2.3.20.5.4. Frequent lubrication (in the case of blowers) or entrainment of filter sand from a backwash sump (in the case of backwash pumps) is required to delay deterioration of equipment. Inspections are to be done regularly on valves on the backwash and air manifolds shut properly every time.

3.2.3.20.6. Disinfection

- 3.2.3.20.6.1. Frequent sampling is required up to the point of consumption to determine the success of disinfection and to calculate the depletion of the disinfectant on an ongoing basis. The monitoring programme must include determinations for both the disinfectant concentration and microbiological quality.
- 3.2.3.20.6.2. Provision must be made to adjust disinfectant concentration when there are rapid changes in raw water quality and possibly also during the different seasons if there is a significant difference in the seasonal water temperature or quality. Accurate control of disinfectant dosages and concentrations are important to ensure effective disinfection, to minimise disinfection byproduct, prevent overdosing in the case of chemical compounds that may lead to offensive taste or odours.
- 3.2.3.20.6.3. When handling chlorine and connections to chlorine containers, all necessary precautions must be taken and the required personal protective equipment be worn at all times. Accidental spills or leaks must be contained and cleaned up using recommended methods in accordance with legal and safety requirements.
- 3.2.3.20.6.4. All chlorine-dosing systems, irrespective of the chlorine compound or the type of dosing equipment selected, require regular maintenance including any problems that may arise such as; blockages of small-bore sodium hypochlorite, dosing lines and corrosion of chlorinators or equipment that comes into contact with chlorine compounds or vapours.

3.2.3.20.7. Storage

- 3.2.3.20.7.1. The service provider will be responsible for monitoring water levels of reservoirs tanks and reporting levels to the End User representatives at the times and frequencies agreed upon collectively by the service provider, the End User and DPWI Project Leader.
- 3.2.3.20.7.2. Reporting water levels is crucial, especially to all Department of Correctional Services' facilities. A service provider shall allow costs for the instatement of temporary relief measures for water level recovery should there be an error or malfunction in the standard or set processes of water provision.

3.2.3.20.8. Distribution

- 3.2.3.20.8.1. The water distributed to the End User must be clean and of high quality at all times. The service provider and the End User are to collaborate their efforts in identifying any leaks (minor or major) resulting in water loss that occur along the water distribution system. The service provider must immediately report identified leaks to the End User and to the relevant DPWI Project Leader.

3.2.3.20.8.2. Any plumbing breakages and/or malfunctions (i.e. valves, pipe, blockages, etc.) along the distribution system within the treatment plant shall be the liability and responsibility of the appointed service provider. The service provider must allow costs for water stabilisation prior to distribution. Any damages that result from untreated or incorrectly treated water are the liability of the service provider i.e. illness, extensive fouling, corrosion, and aggression.

3.3. Corrective Maintenance (Breakdowns)

3.3.1. Operational equipment breakdowns' procedures

The Service Provider will be requested to:

- 3.3.1.1. Report the fault or breakdown of any asset or equipment with its serial and/or CIN to the Project Leader/ Scientist/ Engineer;
- 3.3.1.2. All claims made by the service provider to the Department of Public Works and Infrastructure must be accompanied by the serial and/or identification number of the asset or equipment repaired or replaced;
- 3.3.1.3. Perform work, using rates bid for the supply, delivery and installation of material forming part of the repair work schedule, within the maximum downtime allowed for operational damage, where the Project Leader/ Scientist/ Engineer rules that the damage has been caused by incorrect operation;
- 3.3.1.4. Submit one (1) quotation for repair and/or replacement of the damaged unit, where rates bid are not available and where the Project Leader/ Scientist/ Engineer rules that the damage caused is operational;
- 3.3.1.5. Perform the work on receipt of an order from the Project Leader/ Scientist/ Engineer, within the time provided as part of the quotation;
- 3.3.1.6. Notify the Project Leader/ Scientist/ Engineer well in advanced of completion of the repair work in order to enable inspection, and;
- 3.3.1.7. Refrain from claiming additional establishment costs for such work. The responsibility of determining whether damage to the installation was caused by people other than employees or associates of the Service Provider shall rest with the Project Leader/ Scientist/ Engineer.
- 3.3.1.8. Operational damage caused by the employees, suppliers, subcontractors, etc. of the Service Provider, shall be repaired by the Service Provider at his own cost.

3.3.2. Corrective Maintenance (CM) Material

- 3.3.2.1. The Service Provider is required to undertake timely execution of time-based (interval-based preventative maintenance) and condition-based maintenance to prevent corrective maintenance resulting in asset failures;
- 3.3.2.2. The Service Provider must urgently escalate to the Project Leader/ Scientist/ Engineer an asset failure ascribed to being beyond economic repair, reaching End of Useful Life and over / incorrect use amongst

others, requiring Corrective Maintenance (CM) to restore it to perform its required function;

3.3.2.3. Maximum maintenance down-time on Emergency Corrective Maintenance:-

3.3.2.4. The Service Provider shall be expected to minimise the maintenance down-time on **CM** until the system component is fully operational to the satisfaction of the Project Leader/ Scientist/ Engineer. Should the Service Provider not respond within the maximum down-time as below, the Project Leader/ Scientist/ Engineer may arrange, at the cost of the Service Provider, for the necessary repair work to be done by others and **penalties** shall be levied:

Table 14: Response times on Emergency Breakdown

Item	Required maintenance	Maximum down-time allowed	Payment reduction if exceeded
T.13.6.	Fatal Breakdown (where specified)	Zero (Immediate Response)	R 2500/hour
T.13.7.	Emergency Breakdown	24 hours	R 2500/day

3.3.2.5. The service provider **must allow costs for** and is responsible for supply, delivery to site, commissioning and installation of all **CM** material, spare parts, subcomponents and appurtenances necessary for the complete maintenance of each installation and as part of detailed invoice claims, provide copies of suppliers purchase invoice as follows;

3.3.2.5.1. Corrective maintenance material (Provisional);

3.3.2.5.2. Profit on **CM** material (%);

3.3.2.6. Invoices received from SPs without the supporting evidence of suppliers' purchase invoices shall not be paid and will be and returned to the Service Provider.

3.3.2.7. The Service Provider shall inform the Project Leader/ Scientist/ Engineer of all scheduled deliveries of materials to formally arrange official hand-over with the End User. The Service Provider shall cede any supplier's or factory guarantee of repaired or replaced components to the Employer to ensure that such guarantees are not jeopardised in any way. All workmanship, materials and components used for breakdown repair shall be guaranteed for a minimum three (3) months.

3.3.3. Corrective Maintenance (CM) Labour

3.3.3.1. The Service Provider **must allow costs for** and is responsible to provide **labour** in the form of skilled, trained (with mechanical, electrical or electromechanical trade certificates) and support personnel for Emergency execution for **CM** at all hours of the day / 7 days a week, as

and when an emergency arises, inclusive of all statutory costs, Personal Protective Equipment (PPE), profit and employee incentives throughout the duration of the contract as follows:

- 3.3.3.1.1. Artisan Foreman (Rate only);
- 3.3.3.1.2. Artisan (Rate only);
- 3.3.3.1.3. Semi-skilled / Artisan Assistant (Rate only);
- 3.3.3.1.4. Unskilled / General Labourer (Rate only);
- 3.3.3.1.5. Other (Specify:_____)
- 3.3.3.2. The Service Provider must endeavour to reduce and avoid occurrence of Emergency breakdowns and ensure false alarms are identified before attending to an emergency / deemed emergency. On average, no more than one (1) emergency breakdown per site should occur with preventative (condition-based and interval / routine) maintenance in place. It is therefore estimated an average of **3hrs/ per employee / per site/ per month** shall be consumed as corrective maintenance labour.

3.3.4. Corrective Maintenance Equipment

- 3.3.4.1. The Service Provider **must allow costs for** and is responsible to execute and / or facilitate **Corrective Maintenance (CM)**, by providing **specialised equipment** hire and tools except where otherwise provided. The Service Provider shall provide a comparative quotation from reputable equipment hiring companies where equipment is owned by their firm / company – claims shall only be restricted to equipment hire only. A detailed invoice for equipment hire inclusive of attendance for maintenance (profit) / ownership use must be submitted with a hire company invoice / comparative quotation as follows:
 - 3.3.4.1.1. Vibrating Compressor, static mass 0.5t (Rate);
 - 3.3.4.1.2. Compressor 10.3 m³/min, incl tools & hoses (Rate)
 - 3.3.4.1.3. 50mm Water pump and hoses (Rate)
 - 3.3.4.1.4. Profit and attendance of equipment hire for CM (%).

3.3.5. Corrective Maintenance (CM) Transport

Allowance for the transport rate should include fuel, maintenance, capital cost, insurance, depreciation and travel time.

- 3.3.5.1. The Service Provider **must allow a rate for** and is responsible to execute and / or facilitate **Corrective Maintenance (CM)**, by providing **transport** for conveying material, accessing the site and attending to emergencies as required. The travel distance to each site shall be measured from the following base locations:

Table 15: Base stations for corrective maintenance

Item	Destination	Base location	Allowable Kilometres
T.13.8.	Middeldrift Correctional Centre	King William's Town (Qonce) Post Office: McLean Square	40km (return: 80km)
T.13.9.	Debenek Police Station	King William's Town (Qonce) Post Office: McLean Square	25km (return: 50km)
T.13.10.	Healdtown Police Station	Fort Beaufort Post Office: 6 Market Street	5km (return: 10km)
T.13.11.	Bulembu Air Wing	King William's Town (Qonce) Post Office: McLean Square	20km (return: 40km)
T.13.12.	Grahamstown Military Base	Grahamstown (Makana) Post Office: 94 Hill Street	5km (return: 10km)
T.13.13.	Fort Brown Police Station	Grahamstown (Makana) Post Office: 94 Hill Street	35km (return: 70km)
		Total	130km (return: 260km)

3.3.5.1.1. One (1) tonne pick-up (Rate);

3.3.5.1.2. Five (5) tonne truck (Rate);

3.3.5.2. On average, no more than two (2) emergency breakdowns per site, per month should occur with preventative (condition-based and interval / routine) maintenance in place. It is therefore estimated an average of **520km / month** shall be travelled to attend to corrective maintenance.



Part 4: Penalties & Incentives Scheme



4.1. Penalty Scheme: General

- 4.1.1. Notwithstanding the Conventional Penalties Act (Act No. 15 of 1962), water pollution violates sections of National Water Act and the National Environmental Management Act and attracts fines of up to R10million as it poses a huge health risk to human beings and animals, further leading to environmental degradation;
- 4.1.2. The administration of penalties is the responsibility of the Project Leader in consultation with the Head of Facilities Management (FM) to execute as part of contract management;
- 4.1.3. The Project Leader's responsibility is to conduct site visits, determine areas of non-compliance and expressly stipulate in writing to the Service Provider, the penalty in respect of the delay / defect;
- 4.1.4. A liability for performance deduction shall be levied on the Service Provider for delay or failure to perform any services, or failure to perform to the required standard and / or terms of reference;
- 4.1.5. The Project Leader shall calculate penalties in advance and where not practical, inform the Service Provider within three (3) working days on receipt of the invoice, consult with the Head of FM for decision-making and inform the Service Provider within five (5) working days, of the intention to apply penalties;
- 4.1.6. The Service Provider shall, within a period of five (5) working days of receipt of the "intention to apply penalties" above, confirm acceptance or object in writing to the Head of FM through the Project Leader, subsequent to which a final, rational decision shall be made by the Head of FM and communicated to the Service Provider within a further period of five (5) working days;
- 4.1.7. The dispute on penalties should not unnecessarily delay the payment of the current invoice. If the dispute remains unresolved for a period exceeding seven (7) working days after letter of objection from the Service Provider:
 - 4.1.7.1. Penalties for the current month can be carried over to the invoice of the subsequent month if the penalty is likely to be withdrawn; OR,
 - 4.1.7.2. A payment reduction equal to the penalty can be effected as a part payment, pending the final decision if the penalty is likely to be upheld.
- 4.1.8. The Service Provider should endeavour to deliver timely, quality services to avoid penalties and only submit legitimate requests for suspension or waiving of penalties, wherein the intention is to dispute the liability giving rise to the penalty not the procedural application of the penalty.
- 4.1.9. Penalties shall escalate at the rate in conjunction with the contractual price adjustments and escalation cap.
- 4.1.10. *****NB!** Data / information overlap exists between O&M Manuals, Green / Blue Drop requirements, Condition Assessments, Asset Registers, Maintenance, etc., in the event the penalties are overlapping, the Project Leader shall select penalties of a higher amount / value as a risk management tool.

4.2. Penalty sections

4.2.1. Incident Management Protocol non-compliance penalty

Table 16: Incident Management Protocol non-compliance

Item	Incident Management Protocol (IPM) non-compliance	Description	Payment reduction
T.16.1.	IPM not implemented within 1 st month of site handover	Not in place, partially in place or protocols not in accordance with DWS requirements	R 15 000
T.16.2.	IPM not implemented within 2 nd month of site handover	Not in place, partially in place or protocols not in accordance with DWS requirements	R 20 000
T.16.3.	IPM not implemented within 3 rd month of site handover	Stoppage of work, breach of contract and consideration of termination of contract	R 25 000

4.2.2. Invoice non-compliance penalty

Table 17: Non-compliant invoice

Item	Non-compliant invoice	Description	Payment reduction
T.17.1.	1 st non-compliant invoice	Non-compliant invoices shall commence after the 3 rd month of acceptance of tender	R 500
T.17.2.	2 nd non-compliant invoice	Admin / handling and postage	R 750
T.17.3.	3 rd non-compliant invoice and subsequent	Admin / handling and postage	R1 000

4.2.3. Maintenance Programme, Financial and Performance Reports

Table 18: Non-compliant maintenance programme, finance and performance reports

Item	Maintenance programme, finance and performance reports non-compliance	Description	Payment reduction
T.18.1.	Submission of preliminary reports during the first (1 st) month	<ul style="list-style-type: none"> Includes budget projections, financial expenditure reports, progress reports, meeting minutes and records, etc. Compliance within the first month 	R 5000 / month
T.18.2.	Submission of operational reports on a monthly basis	<ul style="list-style-type: none"> Includes budget projections, financial expenditure reports, progress reports, meeting minutes and records, etc. Submission on a monthly basis 	R 5000 / month

4.2.4. Componentised Asset Register non-compliance

Table 19: Componentised Asset Register non-compliance

Item	Componentised Asset Register non-compliance	Description	Payment reduction
T.19.1.	Not submitted within 3months of site handover	Submitted but not in a compliant format, non-submission, partial submission	R 15 000
T.19.2.	Not submitted by the 4 th month of site handover	Submitted but not in a compliant format, non-submission, partial submission	R 20 000
T.19.3.	Not submitted by the 5 th month of site handover	Stoppage of work, breach of contract and consideration of termination of contract	R 25 000

4.2.5. O&M manual non-compliance

Table 20: O&M manual non-compliance

Item	O&M manual non-compliance	Description	Payment reduction
T.20.1.	Not submitted within 3months of site handover	Submitted but not in a compliant format, non-submission, partial submission	R 15 000
T.20.2.	Not submitted by the 4 th month of site handover	Submitted but not in a compliant format, non-submission, partial submission	R 20 000
T.20.3.	Not submitted by the 5 th month of site handover	Stoppage of work, breach of contract and consideration of termination of contract	R 25 000

4.2.6. Blue / Green Drop non-compliance

Table 21: Blue / Green Drop non-compliance

Item	Blue / Green Drop non-compliance	Description	Payment reduction
T.21.1.	Blue / Green Drop report not submitted within 3months of site handover	Submitted but not in a compliant format, non-submission, partial submission	R 30 000 / month
T.21.2.	Low Green Drop requirement scores	A good condition not achieved within 12 months of site handover	R 50 000 / month
T.21.3.	Low Blue Drop Risk Rating	A Low risk not achieved with 6 months of site handover	R 50 000 / month

4.2.7. Operational Non-compliance

Table 22: Operational non-compliance

Item	Operational non-compliance	Description	Payment reduction
T.22.1.	Occupational Health and Safety (OHS) Act is not adhered to by the service provider	<ul style="list-style-type: none"> • OHS non-compliance matters to be addressed immediately; • Suspension of all on-site operations for OHS non-compliance with the likelihood of fatalities; • The delay(s) in addressing the nature of the OHS non-compliance to be linked with penalties for response times on maintenance 	See / apply penalties on “Response times on maintenance” on the table below
T.22.2.	Staff are not registered, classified or qualified as relates to the operation and maintenance of treatment plants	<ul style="list-style-type: none"> • Qualified staff to be appointed, classified and registered within 21 days of the discovery / notification to Service Provider • Penalty excludes the first month of appointment of the Service Provider 	R 5000 / day
T.22.3.	Water/ wastewater not tested as per SANS 241 frequency (on-site)	Penalty shall apply per month, till non-compliance has been addressed	R 30 000 / month
T.22.4.	Laboratory results are not submitted to IRIS	Penalty shall apply per month, till non-compliance has been addressed	R 30 000 / month
T.22.5.	Laboratory results are non-compliant	<ul style="list-style-type: none"> • Includes overall non-compliance, Analytes and/or parameters tested are not complete or included in the laboratory report • Identify whether non-compliance can be rectified within a week / if emergency in nature, cross-reference with emergency response on maintenance / non-compliant aspect 	See / apply penalties on “Response times on maintenance” on the table below
T.22.6.	Errors highlighted by laboratory results are not rectified within a week of receiving the laboratory report	<ul style="list-style-type: none"> • Cross-reference with emergency response on maintenance and / or non-compliance above • Apply penalties per week 	See / apply penalties on “Response times on maintenance” on the table below
T.22.7.	On-site immediate and/or urgent matters requiring the intervention of DPWI are not reported promptly	<ul style="list-style-type: none"> • Cross-reference with emergency response on maintenance 	See / apply penalties on “Response times on maintenance”



Item	Operational non-compliance	Description	Payment reduction
		<ul style="list-style-type: none"> Penalties for non-reporting incidents shall be similar but in addition to the response times on maintenance; 	on the table below
T.22.8.	Chemicals used are non-compliant with SABS	<ul style="list-style-type: none"> Non-compliant chemicals to be immediately removed from site by the Service Provider on discovery; Penalties to be applied retrospectively on the assumption that non-compliant chemicals were used from the commencement month of the contract till the date of discovery. 	R 30 000 / month (applied retrospectively)
T.22.9.	Insufficient chemical supply for operation of the plant and /or no alternative used	<ul style="list-style-type: none"> The delay(s) in providing sufficient chemicals to be linked with penalties for response times on maintenance 	See / apply penalties on "Response times on maintenance" on the table below
T.22.10.	End User organoleptic displeasure is not addressed/ reported	<ul style="list-style-type: none"> Displeasure to be addressed within a week, thereafter a weekly penalty should be levied for incidents within the control of the Service Provider 	R 5 000 / week
T.22.11.	Analysis results are not credible	<ul style="list-style-type: none"> Identify whether non-compliance can be rectified within a week / if emergency in nature, cross-reference with emergency response on maintenance / non-compliant aspect Alternatively, DPWI to appoint an independent Service Provider for the submission of credible results 	Alternative Service Providers' quotation and add R1500 DPWI administration fee or 5% of the quotation (whichever is higher)
T.22.12.	Samples are not taken at all sampling points in the treatment plant	<ul style="list-style-type: none"> Samples to be taken at all sampling points by the Service Provider within a period of three (3) days of discovery. If non-compliance continues; DPWI to appoint an independent Service Provider for sampling 	Alternative Service Providers' quotation and add R1500 DPWI administration fee or 5% of the quotation (whichever is higher)
T.22.13.	Compliance monitoring is not well-recorded	<ul style="list-style-type: none"> Service Provider to rectify all the compliance monitoring records within seven (7) 	Alternative Service Providers'

Item	Operational non-compliance	Description	Payment reduction
		working days. If non-compliance continues; <ul style="list-style-type: none"> DPWI to appoint an independent Service Provider for sampling 	quotation and add R1500 DPWI administration fee or 5% of the quotation (whichever is higher)
T.22.14.	Insufficient or inconsistent supply of water testing kits	<ul style="list-style-type: none"> Service Provider to provide sufficient water testing kits within fourteen (14) working days. If non-compliance continues; DPWI to appoint an independent Service Provider for the supply of testing kits 	Alternative Service Providers' quotation and add R1500 DPWI administration fee or 5% of the quotation (whichever is higher)

Table 23: Response times on maintenance

Item	Required maintenance	Maximum down-time allowed	Payment reduction if exceeded
T.23.1.	Fatal Breakdown (where specified)	Zero (Immediate Response)	R 2500/hour
T.23.2.	Emergency Breakdown	24 hours	R 2500/day
T.23.3.	Ordinary Breakdown	5 days	R500/day
T.23.4.	Operational damage repair	5 days	R500/day

4.3. Incentive Scheme

The renewal of contract shall be subject to a good-to-excellent overall performance of the Service Provider and implementation of sustainability and the circular economy initiatives as follows but not limited to:

4.3.1. Sludge beneficiation

Local beneficiation of sludge for agricultural and commercial use (e.g. power generation), including established / innovative methods to be implemented by the Service Provider.

4.3.1.1. Bio-gas harvesting and use

Harvesting of bio-gas as a renewable energy source, including established / innovative methods to be implemented by the Service Provider.

4.3.1.2. Treated water beneficiation

Harvesting of treated water for agricultural and commercial use, including established / innovative methods to be implemented by the Service Provider.

Table 24: Renewal of Contract

Item	Incentive	Conditions	Comment
T.24.1.	Renewal of Contract for a further period of 12 months	<ul style="list-style-type: none"> • Low risk of Blue Drop risk rating, and • Good-to-excellent condition rating of the Green Drop, and /or • Contract value of 24 months (all expenditure) within 5% of the contract amount (tendered); and / or • Maximum zero to five (0 – 5) penalties with a total amount not exceeding R50 000 (Fifty thousand) 	To qualify for renewal of contract, the Service Provider must meet at least three conditions, with the Blue / Green Drop requirements being mandatory
T.24.2.	Renewal of Contract for a further period of 24 months: Sustainability Improvements	<ul style="list-style-type: none"> • Low risk of Blue Drop risk rating, and • Good-to-excellent condition rating of the Green Drop, and • Implement a successful harvesting of Bio-gas for use in operations / commercialisation and share 50% of profits between DPWI and Service Provider, and /or • Contract value of 24 months (all expenditure) within 5% of the contract amount (tendered); and / or • Maximum zero to five (0 – 5) penalties with a total amount not exceeding R50 000 (Fifty thousand) 	To qualify for renewal of contract, the Service Provider must meet at least four (4) conditions, with the Blue / Green Drop and Bio-gas harvesting requirements being mandatory

4.3.2. Savings Cash-back Incentive

Table 25: Savings Cash-back

Item	Incentive	Conditions	Comment
T.25.1.	10% savings cash-back of the amount saved	<ul style="list-style-type: none"> • Contract must have been renewed; and • Savings must not exceed 5% of the contract amount, including the renewal period; and • Contract must be ending at month 36, with incentives being paid at the end of contract; and • Budget must be available 	<p>Example:</p> <p>(1) Contract value = R10m;</p> <p>(2) Savings limited to a maximum 5% = R10m x 5% = R500 000</p> <p>(3) 10% cash-back is R500 000 savings x 10% = R50 000.</p>

4.3.3. Recognition as a Management Contractor

Table 26: Savings Cash-back

Item	Incentive	Conditions	Comment
T.26.1.	Recognition by DPWI as a Management / Mentor Contractor	<ul style="list-style-type: none"> • Successful implementation of EPWP; and • Contractor and Local Economic Development Programme • 	<ul style="list-style-type: none"> • The letter of recognition will serve as an advantage on appointment of a Managing Contractor on future DPWI projects • The letter shall be signed by the Director: SCM at DPWI



Part 5: Details of Treatment Plants

5.1. Middledrift Prison Wastewater Treatment Works

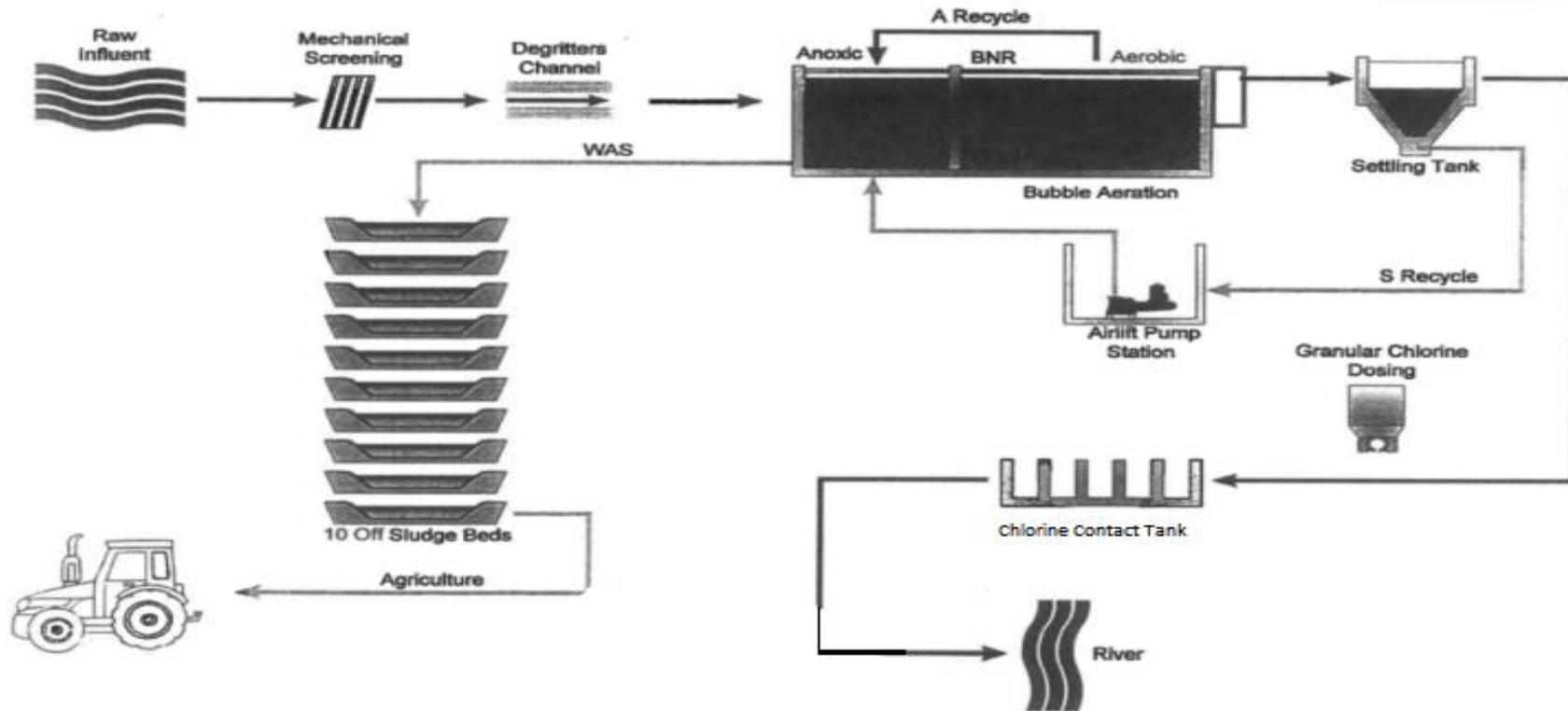


Figure 4: Middledrift Correctional Services process diagram for treatment works

Table 27: Middledrift Correctional Services waste water treatment plant details

Name	Class	Hydraulic design capacity (m ³ / d)	Average dry weather flow (m ³ / d)	Organic load (kg/d)	Location	Treatment Processes
Middledrift Correctional Services WWTWs	D	600	226.2	164.1	S32°48'52.66" E26°59'30.90"	Hand screen: 12mm bar spacing, est. capacity 2 970 kl/d
						Degritters: 13m long, 1.2m wide capacity est. 2 970 kl/d
						Bioreactor: Anoxic 261m ³ , Aerobic 392 m ³
						2x S-recycle pump = 1.5 x ADWF, 3.0 ADWF
						Clarifier: 516m ²
						Disinfection: 54m ³
						Sludge drying beds: 563 m ³

5.2. Middeldrift Prison Piggery Wastewater Treatment Works

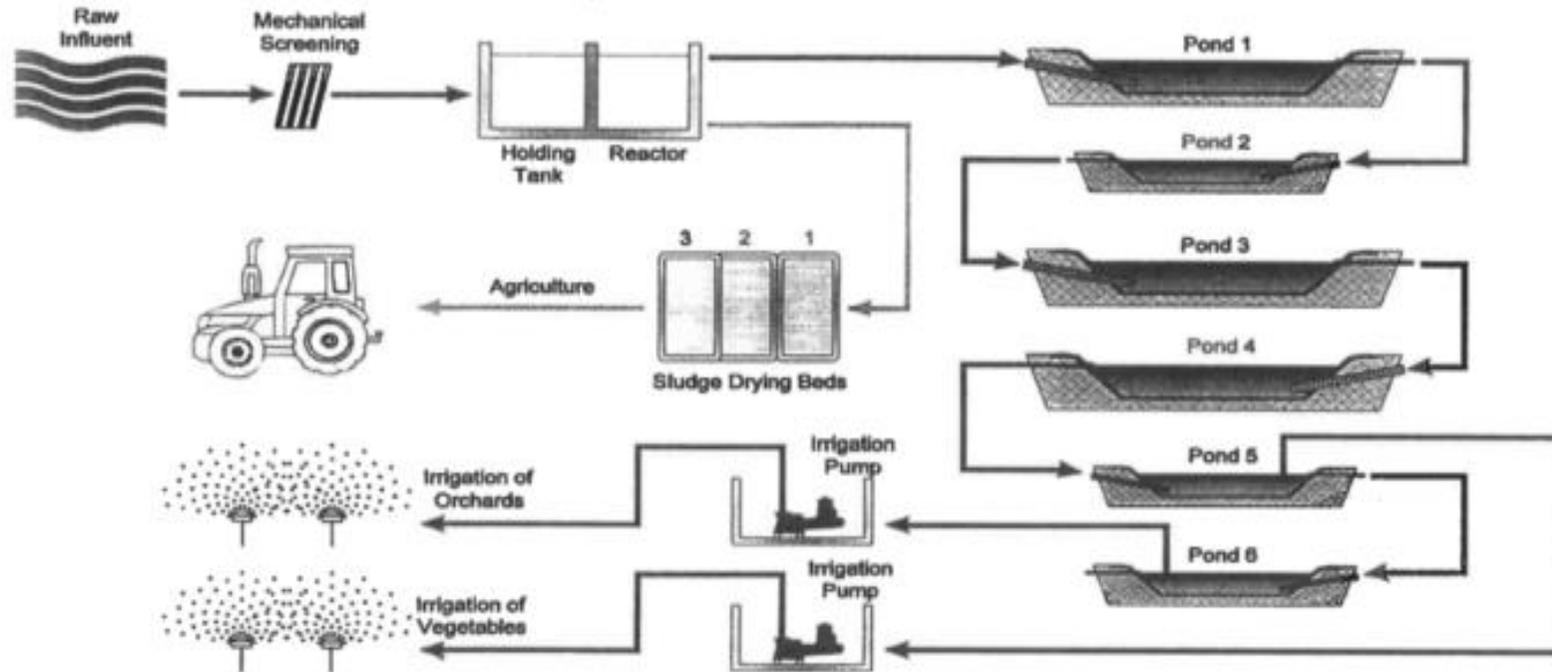


Figure 5: Middeldrift Correctional Services Piggery process diagram for treatment works

Table 28: Middledrift Correctional Services “Piggery” waste water treatment plant details

Name	Class	Hydraulic design capacity (m ³ / d)	Average dry weather flow (m ³ / d)	Organic load (kg/d)	Location	Treatment Processes
Middledrift Correctional Services “Piggery”	-	-	-	-	S32°48'52.66” E26°59'30.90”	Mechanical Screen: Unknown dimensions
						Holding tank: 75m ³
						Septic/holding tank: 22m ³
						Pond 1: 6 720m ³
						Pond 2: 2 400m ³
						Pond 3: 6 000m ³
						Pond 4: 3 600m ³
						Pond 5: 1 350m ³
						Pond 6: 1 350m ³
						Irrigation pump – orchards: unknown size
Irrigation pump – vegetation: flow rate unknown, 30kW motors						

5.3. Debenek Wastewater Treatment Works

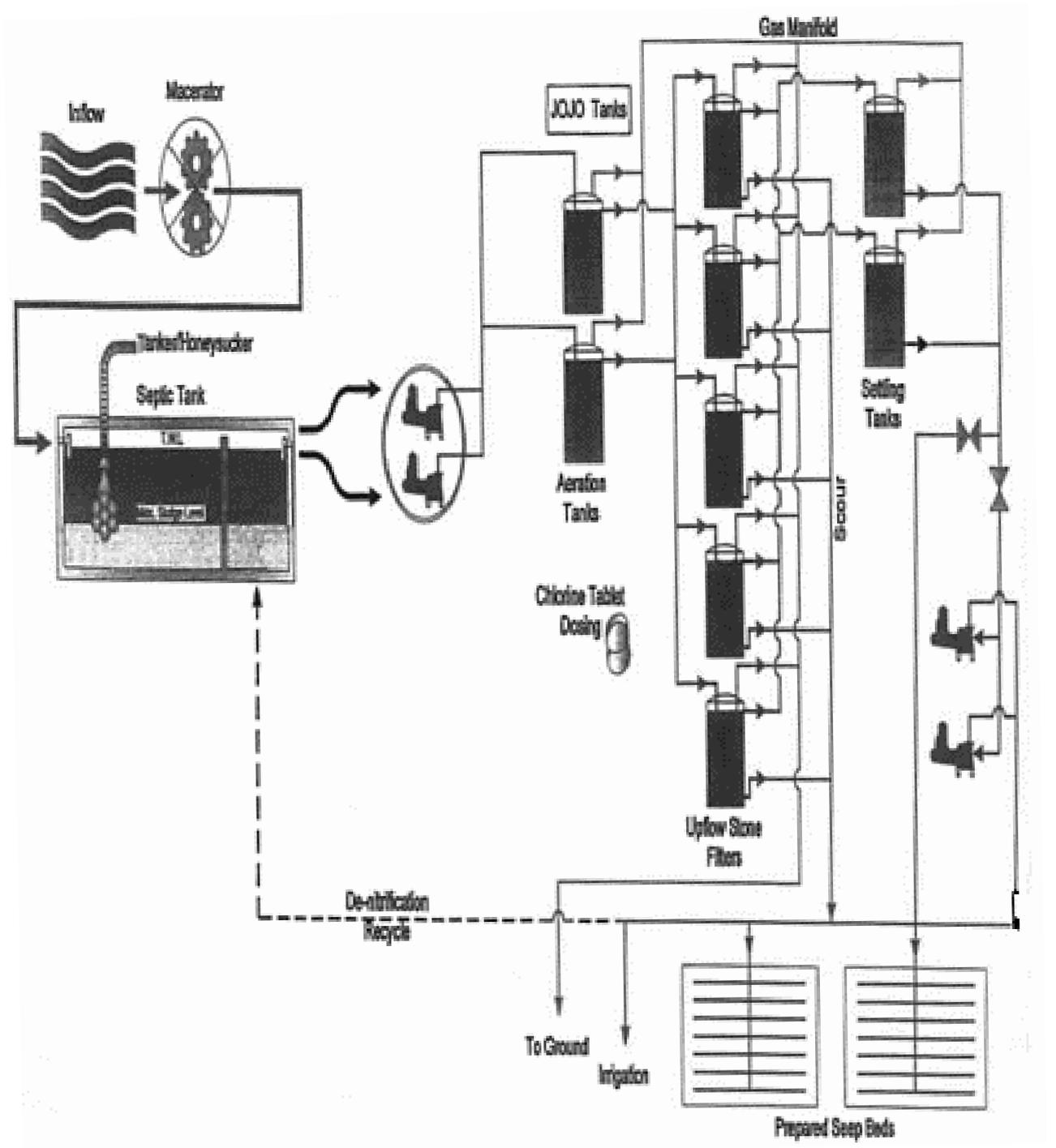


Figure 6: Debenek South African Police Service process diagram of treatment works

Table 29: Debenek (Chungwa) South African Police Service waste water treatment plants

Name	Class	Hydraulic design capacity (m ³ / d)	Average dry weather flow (m ³ / d)	Organic load (kg/d)	Location	Treatment Processes
Debenek South African Police Service	D	12.7	2.3	10.7	S32°50'21.4" E27°09'21.3"	Macerators: Size unknown
						Septic Tank: 1 st chamber: 1.5W x 3.0L x est. 3.0D =13.5m ³ 2 nd chamber: 1.5W x 1.5L x est. 3.0D =6.75m ³
						Settled Water pumps
						Receiving tanks or possibly aeration tanks: 5m ³ Jojo tanks (2)

5.4. Healdtown Wastewater Treatment Works

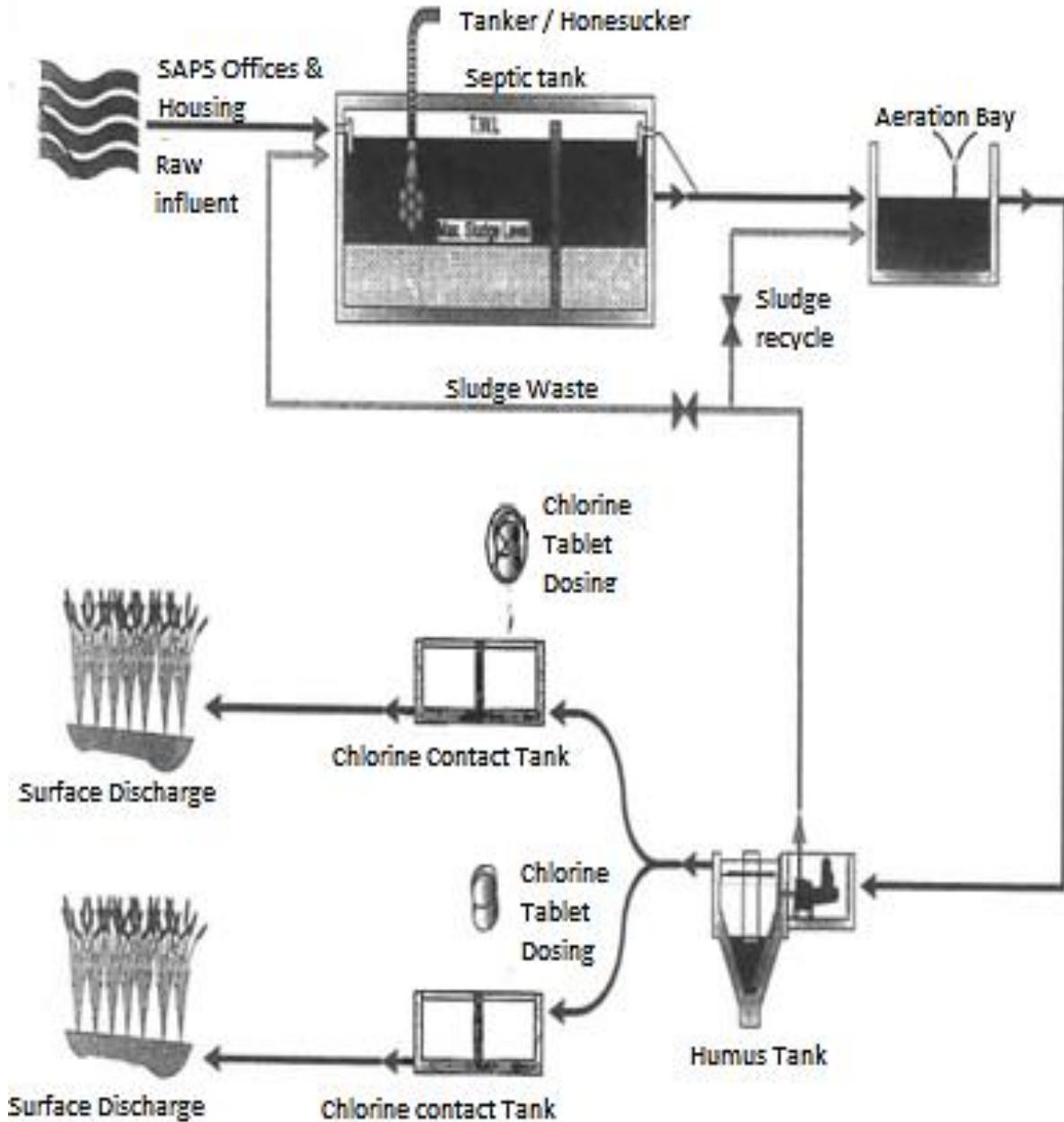


Figure 7: Healdtown South African Police Service process diagram of treatment works

Table 30: Healdtown South African Police Service waste water treatment plants

Name	Class	Hydraulic design capacity (m ³ / d)	Average dry weather flow (m ³ / d)	Organic load (kg/d)	Location	Treatment Processes
Healdtown South African Police Service	D	17	15	3.3	S32°44'55.8" E26°39'20.5"	Septic tank: 6L x 2.25W x 1D = 13.5m ³
						Aeration reactor: 3L x 2W x 1D = 6m ³
						Humus Tank: top diameter = 2m = 3.14 m ²
						Recycle Pump
						Chlorination channel 1: 2.6L x 0.8W x 1D = 21m ³
						Chlorination channel 2: 2.3L x 0.9W x 0.25D = 0.5m ³

5.5. Bulembu SAPS Air Wing Waste Water Treatment Works

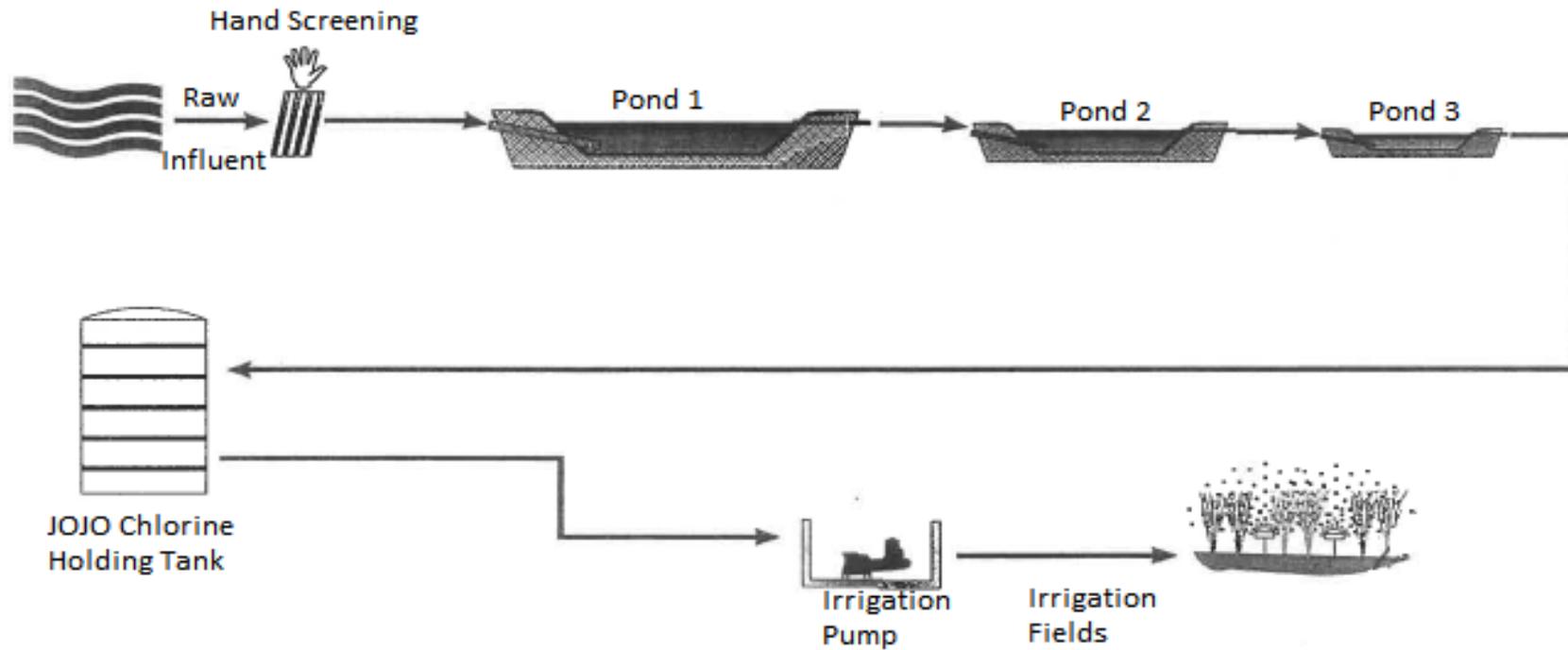


Figure 8: Bulembu South African Police Service Air Wing process diagram for treatment works

Table 31: Bulembu South African Police Service Air Wing waste water treatment plant details

Name	Class	Hydraulic design capacity (m ³ / d)	Average dry weather flow (m ³ / d)	Organic load (kg/d)	Location	Treatment Processes
Bulembu South African Police Service Air Wing WWTWs	E	15	93	3.9	S32°53'30" E27°16'24"	Screen: 15mm coarse screen, hand raked.
						Pond 1: 932 m ³
						Pond 2: 529 m ³
						Pond 3: 259 m ³
						Jojo holding tank for chlorination: Normal Jojo tank about 20m ³
Irrigation pump station: Normal Jojo tank about 20m ³ , pump size not determined.						

5.6. Grahamstown South African National Defence Force Wastewater Treatment Works

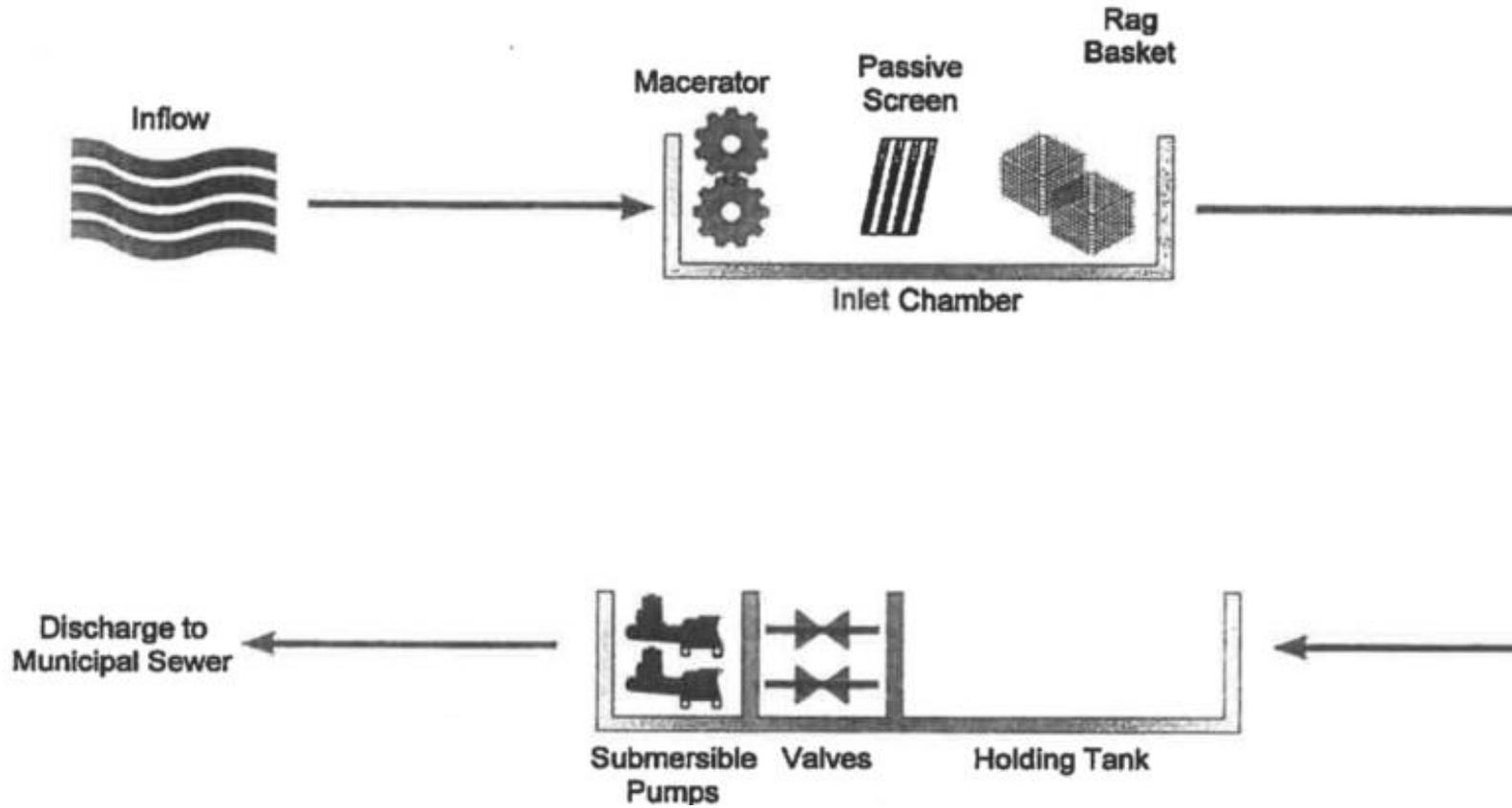


Figure 10: Bulembu South African Police Service Air Wing process diagram for treatment works

Table 32: Grahamstown South African National Defence Force waste water treatment plant details

Name	Class	Hydraulic design capacity (m ³ / d)	Average dry weather flow (m ³ / d)	Organic load (kg/d)	Location	Treatment Processes
Grahamstown South African National Defence Force WWTWs	-	-	311.1	-	S33°16'57.7" E26°30'12.9"	Screening: Two baskets installed in manholes
						Macerator: Sizing unknown
						Coarse screens and additional screening: 25-40mm spaced screens with additional baskets
						Balancing tank: sump: 5m W x 4m H x 9m L. The tank is divided into two halves to facilitate servicing.
						Sewage pumps: 2 Pumps

5.7. Fort Brown South African Police: Water Treatment Works

Name	Class	Hydraulic design capacity (m ³ / d)	Average dry weather flow (m ³ / d)	Organic load (kg/d)	Location	Treatment Processes
Fort Brown South African Police Station WTW	-	-	-	-	S33°07'46" E26°37'03"	<p>Water is extracted from the Great Fish River by means of two submersible pumps into the raw water tanks located on the deck of the bridge.</p> <p>A booster pump then delivers water from the two tanks to the WTW with 110mm PVC main.</p> <p>The 100mm PVC pumping main discharges into the first of the three water tanks (each of 10 000l capacity).</p> <p>The flow to the WTW is metred, flocculant is added to the first tank. All three tanks act as clarifiers, and de-sludge via their bottom outlets.</p> <p>A lifter pump extracts settled water from the third raw water and pushes it through a pressure filter into 9m³ elevated galvanised steel storage tank.</p> <p>The filter water is disinfected in-line prior to discharge into the final water storage tank.</p> <p>The plant is fully automated (apart from desludging of the raw water tanks, which is a manual operation) and pumps are controlled with telemetry.</p>



Part 6: Pricing Schedule

**KING WILLIAM'S TOWN AND SURROUNDING AREAS: OPERATION
AND MAINTENANCE OF WATER CARE FACILITIES, BOREHOLES AND WATER SOFTENERS**

Item No.	Quantity	Rate	Amount
<u>SCHEDULE NO. 1: CONTRACT MANAGEMENT AND COMPLIANCE</u>			
<u>GENERAL</u>			
<u>NOTES:</u>			
(I)	The agreement is to be the Facilities Management Conditions of Contract (DPW) SEPT. 2005 VERSION 1		
(II)	Pursuant to this contract, the rates shall be subject to an annual escalation cap limited to five percent (5%) per annum, the base rate being the date of an award of tender.		
(iii)	Tenderers are referred to the abovementioned documents for the full intent and meaning of each clause thereof (hereinafter referred to by heading and clause number only) for which such allowance must be made as may be considered necessary.		
(iv)	Where standard clauses or alternatives are not entirely applicable to this contract such modifications, corrections or supplements as will apply are given under each relevant clause heading.		
(v)	Where any item is not relevant to this specific contract such item is marked N/A (signifying "not applicable").		
(vi)	Grouping of items necessitating the completion of works is allocated per type of maintenance to be executed. interval-based maintenance has fixed costs, Condition based maintenance has semi-variable costs and corrective maintenance has variable costs.		
(vii)	The Service Provider is expected to familiarise themselves with the site and condition of the respective Water Plants and Wastewater Treatment Plants to accurately estimate the resources required for the successful Operations & Maintenance (O&M)		
		R	Not priced
<p>KWT & SURROUNDING AREAS SCHEDULE NO. 1: CONTRACT MANAGEMENT AND COMPLIANCE DPWI: GQEBERHA REGIONAL OFFICE FACILITIES MANAGEMENT</p>			

**KING WILLIAM'S TOWN AND SURROUNDING AREAS: OPERATION
AND MAINTENANCE OF WATER CARE FACILITIES, BOREHOLES AND WATER SOFTENERS**

Item No.		Quantity	Rate	Amount
	Brought Forward		R	Not priced
	<u>1.2. MOBILISATION (SITE ESTABLISHMENT), TRANSITION CONTRACT MANAGEMENT AND DEMOBILISATION</u>			
	The costs for mobilisation, transition and demobilisation are fixed but spread over several months, while overhead costs are variable. For ease of contract management, the costs are spread throughout the duration of the contract as overhead costs			
1	1.2.1. Mobilisation, overhead costs and demobilisation	Month	12	
	<u>OCCUPATIONAL HEALTH AND SAFETY COMPLIANCE</u>			
	<u>Occupational Health and Safety Specification</u>			
	The Service Provider shall with reference to the Health and Safety specification, and without limiting his obligations in terms of the Occupational Health and Safety Act, 1993, allow for the following terms in his costing for all sites included			
2	1.3.6.1. Provision of Health and Safety Plan(s)	Sum	1	
3	1.3.6.2. OHS file on-site(s) and maintained	Sum	1	
4	1.3.6.3. Hazard identification, risk assessment(s) and mitigation	Sum	1	
5	1.3.6.4. Personal Protective Equipment (PPE) and clothing (allowed elsewhere but cost can be allowed under this section)	Sum	1	
6	1.3.6.5. First aid kits and re-filling	Sum	1	
7	1.3.6.6. OHS Act on-site displayed	Sum	1	
8	1.3.6.7. Site inspection and incident reporting	Sum	1	
9	1.3.6.8. Health and Safety Committee establishment and training	Sum	1	
	Carried Forward		R	
	KWT & SURROUNDING AREAS SCHEDULE NO. 1: CONTRACT MANAGEMENT AND COMPLIANCE DPWI: GQEBERHA REGIONAL OFFICE FACILITIES MANAGEMENT			

**KING WILLIAM'S TOWN AND SURROUNDING AREAS: OPERATION
AND MAINTENANCE OF WATER CARE FACILITIES, BOREHOLES AND WATER SOFTENERS**

Item No.		Quantity	Rate	Amount
	Brought Forward		R	
	<u>1.4. MANAGEMENT AND COMPLIANCE HUMAN RESOURCES</u>			
	Employment, verification of qualifications and citizenship, registration & classification of all Management and Compliance Human Resources (internal & external)			
10	1.4.1.1. Water Quality Scientist	Month	12	
11	1.4.1.2. Contract Manager / Plant Superintendent	Month	12	
12	1.4.1.3. Health and Safety Officer	Month	12	
12	1.4.1.4. Instrument technician (Available when required)	Month	12	
13	1.4.1.5. Civil Engineer (Part-time)	Month	12	
14	1.4.1.6. Other (Specify:_____)	Month	12	
15	1.4.1.7. Training & development of management and compliance Human Resources	Sum	1	
	<u>1.5. MANAGEMENT / SUPERVISIOIN OF OPERATIONS</u>			
	Provision of Management / Supervision of Personnel for the duration of the contract			
16	1.5.1.1. Manager(s) / Supervisor(s) of personnel	Month	12	
17	1.5.1.2. Training & development of Manager(s) / Supervisor(s)	Sum	1	
	<u>1.6. MEDICAL SURVEILLANCE AND CERTIFICATES</u>			
	Perform base medical examinations and obtain medical certificates of all employees prior to their employment, during employment and at the exit of employment			
18	1.6.1. Initial baseline medical examinations	Sum	1	
19	1.6.2. Periodic and exit medical examinations	Sum	1	
20	1.6.3. Vaccination of wastewater treatment plants personnel	Sum	1	
	Carried Forward		R	
	KWT & SURROUNDING AREAS SCHEDULE NO. 1: CONTRACT MANAGEMENT AND COMPLIANCE DPWI: GQEBERHA REGIONAL OFFICE FACILITIES MANAGEMENT			

**KING WILLIAM'S TOWN AND SURROUNDING AREAS: OPERATION
AND MAINTENANCE OF WATER CARE FACILITIES, BOREHOLES AND WATER SOFTENERS**

Item No.		Quantity	Rate	Amount
	Brought Forward		R	
	<u>1.7. EXPANDED PUBLIC WORKS IMPLEMENTATION</u>			
	EPWP Beneficiaries including training, reporting, provision of branded Personal Protective Equipment (PPE)			
21	1.7.3.1. EPWP beneficiaries	Sum	1	
22	1.7.3.2. Social facilitation in communities prior to recruitment	Sum	1	
23	1.7.3.3. Initial baseline medical examinations	Sum	1	
24	1.7.3.4. Periodic and exit medical examinations	Sum	1	
25	1.7.3.5. Training of EPWP beneficiaries	Sum	1	
26	1.7.3.6. EPWP reporting	Sum	1	
	<u>1.8. OPERATION AND MAINTENANCE MANUAL</u>			
	Drafting, developing and implementing a comprehensive Operation and maintenance manual			
27	1.8.4.1. Wastewater treatment plant O&M manual	No.	6	
28	1.8.4.2. Water treatment plant O&M manual	No.	1	
	<u>1.9. GREEN DROP REGULATION COMPLIANCE</u>			
	Conduct a Green Drop Assessment and ensure audit outcomes implementation on all relevant sites before and while performing work on wastewater treatment plants			
29	1.9.1. Green Drop Assessment and implementation	Month	12	
	<u>1.10. BLUE DROP REGULATION COMPLIANCE</u>			
	Conducting a Blue Drop Assessment and ensure audit outcomes implementation on all relevant site(s) before and while performing work on water and treatment plants			
30	1.10.1. Blue Drop Assessment and implementation	Month	12	
	Carried Forward		R	
	KWT & SURROUNDING AREAS			
	SCHEDULE NO. 1: CONTRACT MANAGEMENT AND COMPLIANCE			
	DPWI: GQEBERHA REGIONAL OFFICE			
	FACILITIES MANAGEMENT			

**KING WILLIAM'S TOWN AND SURROUNDING AREAS: OPERATION
AND MAINTENANCE OF WATER CARE FACILITIES, BOREHOLES AND WATER SOFTENERS**

Item No.		Quantity	Rate	Amount
	Brought Forward		R	
	1.11. ASSET REGISTER			
	Drafting, developing, implementing and maintaining a componentised asset register and Component Identification Numbers (CIN) and tags for all assets in respective sites			
31	1.11.1. Componentised asset register including a Component Identification System	No.	7	
32	1.11.2. Component Identification Number (CIN) tags	No.	7	
33	1.11.3. Copies of asset register	No.	7	
	1.12. FACILITY CONDITION ASSESSMENT			
	Drafting, developing, implementing and maintaining a componentised asset register and Component Identification Numbers (CIN) and tags for all assets			
34	1.12.1. Condition assessment report(s)	No.	7	
35	1.12.2. Development of a prioritised maintenance plan	No.	7	
	1.13. INCIDENT MANAGEMENT PROTOCOL			
	Prepare, review, and maintain a detailed and comprehensive incident management protocol for each water and wastewater facility			
36	1.13.1. Incident management protocol	No.	7	
	1.14. INSURANCE			
	Provision of comprehensive insurance cover for the duration of the contract to include but not limited to general liability, public liability, damage, theft, force majeure (Acts of God), etc.			
37	1.14.1. Insurance cover	Month	12	
	Carried to Summary		R	
	KWT & SURROUNDING AREAS			
	SCHEDULE NO. 1: CONTRACT MANAGEMENT AND COMPLIANCE			
	DPWI: GQEBERHA REGIONAL OFFICE			
	FACILITIES MANAGEMENT			

**KING WILLIAM'S TOWN AND SURROUNDING AREAS: OPERATION
AND MAINTENANCE OF WATER CARE FACILITIES, BOREHOLES AND WATER SOFTENERS**

Item No.		Quantity	Rate	Amount
	<u>SCHEDULE NO.2: OPERATION</u>			
	<u>2.1. OPERATIONS REGISTRATION OF TREATMENT PLANTS AND PERMIT RENEWALS</u>			
	Facilitate, ensure and provide evidence of registration of plants with the Department of Water and Sanitation and obtain permits, including renewal of permits prior to expiry			
38	2.1.1. Registration of water / wastewater treatment facilities and permit renewals	Sum	1	
	<u>2.2. OPERATIONS HUMAN RESOURCES</u>			
	Employment, verification of qualifications and citizenship, registration & classification of all Operations Human Resources (internal & external) for all the plants as regulated			
39	2.2.1.1. Supervisor(s)	Month	12	
40	2.2.1.2. Process Controller(s) / Operators;	Month	12	
41	2.2.1.3. General Workers	Month	12	
	<u>2.3. OPERATIONS MATERIALS AND CONSUMABLES</u>			
	Provide SABS / SANS approved material and consumables for treatment of waste and water, disinfection, testing and ensuring compliance of treatment plants			
42	2.3.1.1. Green Drop kits including servicing	Month	12	
43	2.3.1.2. Blue drop kits including servicing	Month	12	
44	2.3.1.3. Dissolved Oxygen meters for activated sludge plants	Sum	1	
45	2.3.1.4. Sampling kit and sampling bottles	Sum	1	
46	2.3.1.5. High pressure hose machine	Sum	1	
47	2.3.1.6. Water and wastewater treatment chemicals	Sum	1	
48	2.3.1.7. Portable submersible pump	No.	5	
	Carried Forward		R	
	KWT & SURROUNDING AREAS SCHEDULE NO.2: OPERATION DPWI: GQEBERHA REGIONAL OFFICE FACILITIES MANAGEMENT			

**KING WILLIAM'S TOWN AND SURROUNDING AREAS: OPERATION
AND MAINTENANCE OF WATER CARE FACILITIES, BOREHOLES AND WATER SOFTENERS**

Item No.		Quantity	Rate	Amount
	Brought Forward		R	
	<u>2.4. OPERATIONS PLANT, MACHINERY, VEHICLES AND EQUIPMENT</u>			
	Provide all commercial mechanical and electrical equipment and machinery (energy saving with low operating noise less than 85 decibels) necessary for the effective and efficient operation of the water and wastewater treatment plants and attending to grounds / horticultural services and cleaning			
49	2.4.1.1. Commercial brush cutters	Sum	1	
50	2.4.1.2. Commercial lawn mowers	Sum	1	
51	2.4.1.3. Commercial vacuum cleaners and blowers	Sum	1	
52	2.4.1.4. Wheelbarrows, spades, hard brooms, hand rakes, scoop nets, skips/ grit removal bins, digging folks	Sum	1	
	***All the items in 2.4.1.4 shall become property of DPWI at the end of the contract.			
	<u>Provide vehicle(s) including fuel and drivers, not limited to as follows:</u>			
53	2.4.4.1. Vehicle(s): 1 tonne pick-up(s) and / or trailer(s),	Month	12	
54	2.4.4.2. Quad bike(s)	Month	12	
55	2.4.4.3. Other (Specify: _____)	Month	12	
	<u>2.5. SECURITY PROVISION AND SECURITY CLEARANCE OF PERSONNEL</u>			
	Perform security risk assessment, implement security measures and provide Private Security Industry Regulating Authority (PSIRA) accredited Security Officers for the protection of assets and personnel on respective sites			
56	2.5.1. Security Clearance of Employees	Sum	1	
57	2.5.2. Security Officers	Month	12	
	2.5.4. Burglar alarms, security detection and field devices	Sum	1	
	Carried Forward		R	
	KWT & SURROUNDING AREAS SCHEDULE NO.2: OPERATION DPWI: GQEBERHA REGIONAL OFFICE FACILITIES MANAGEMENT			

**KING WILLIAM'S TOWN AND SURROUNDING AREAS: OPERATION
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Item No.		Quantity	Rate	Amount
	Brought Forward		R	
	<u>2.6. OPERATIONS MONITORING PROGRAMME</u>			
	Provide and implement a properly designed standard operating procedure (SOP) for all operations, schematic and laminated layout including proof of operational monitoring of site(s), determinants and frequency of testing or analyses			
58	2.6.1. Standard operating procedure (SOP)	Sum	1	
	<u>2.8. GROUNDWATER, UPSTREAM AND DOWNSTREAM MONITORING</u>			
59	2.8. Bio-monitoring, geohydrological reports and drilling of borehole	Prov	1 100,000.00	100,000.00
	<u>2.9. WATER AND WASTEWATER TESTING AND COMPLIANCE MONITORING PROGRAMME</u>			
	Ensure compliance with the blue drop certification for the testing of drinking water on respective sites and submission of results to a SANAS accredited laboratory in accordance with industry standards (SABS / SANS) and ensure compliance			
60	2.9.1.1. Testing drinking water / portable water	Month	12	
	Ensuring compliance with the green drop certification for the testing of drinking water on respective sites and submission of results to a SANAS accredited laboratory in accordance with industry standards (SABS / SANS) and ensure compliance			
61	2.9.2.1. Testing wastewater	Month	12	
	<u>2.11. WATER RESULTS QUALITY MANAGEMENT, SUBMISSION AND PUBLICATION</u>			
	Implement a water quality monitoring programme, reporting, uploading on the IRIS, submitting to DPWI, benchmarking and publishing of results			
62	2.11. Water quality management	Sum	1	
	Carried to Summary		R	
	KWT & SURROUNDING AREAS SCHEDULE NO.2: OPERATION DPWI: GQEBERHA REGIONAL OFFICE FACILITIES MANAGEMENT			

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Item No.		Quantity	Rate	Amount
	<u>SCHEDULE NO.3: MAINTENANCE</u>			
	<u>3.1. PRINCIPLES AND RESPONSIBILITY OF PLANT MAINTENANCE</u>			
	Maintain hard-cover A4 maintenance files and excel electronic records for each installation for the duration of the Contract. All schedules, checklists, breakdown reports, preventative maintenance records, component replacement records			
63	3.1.6. Maintenance records including reports	Sum	1	
	<u>Communication and complaint logging procedure as part of the maintenance control plan</u>			
64	3.1.7. Maintenance communication	Month	12	
	<u>Development and implementation of the maintenance control plan to include components / subcomponents, the area of installation, the frequency of routine maintenance / inspections and format of reports</u>			
65	3.1.8. Maintenance control plan	Sum	1	
	<u>3.2. PREVENTATIVE MAINTENANCE</u>			
	<u>3.2.2. Condition-Based Maintenance (CBM)</u>			
	<u>Material inclusive of profit and attendance as part of detailed invoice claims, providing copies of suppliers purchase invoice to substantiate claims</u>			
66	3.2.2.8.1. Condition-based maintenance material	Prov	1	450,000.00
	<u>Shared services Labour for interval-based maintenance with trade test qualifications for skilled personnel inclusive of all statutory costs, Personal Protective Equipment (PPE), profit and attendance and employee incentives throughout the duration of the contract</u>			
67	3.2.2.9.1. Maintenance manager(s)	Month	12	
68	3.2.2.9.2. Millwright	Month	12	
69	3.2.2.9.3. Electrician	Month	12	
70	3.2.2.9.4. Semi-skilled	Month	12	
71	3.2.2.9.5. General worker(s)	Month	12	
72	3.2.2.9.6. Other (Specify: _____)	Month	12	
	Carried Forward			R
	KWT & SURROUNDING AREAS SCHEDULE NO.3: MAINTENANCE DPWI: GQEBERHA REGIONAL OFFICE FACILITIES MANAGEMENT			

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Item No.			Quantity	Rate	Amount
	Brought Forward			R	
	<u>Specialised sub-contractors for specialised maintenance inclusive of attendance for maintenance (profit) and as part of detailed invoice claims, providing copies of suppliers purchase invoice (Provisional)</u>				
73	3.2.2.10.1. Specialised sub-contractor services for CBM	Prov	1	67,500.00	67,500.00
74	3.2.2.10.2. Profit and attendance on specialised services for CBM	%		67,500.00	
	<u>Specialised equipment hire and tools, profit and attendance or provision of a comparative quotation from reputable equipment hiring companies wherein equipment is owned by the Service Provider's firm / company – claims shall only be restricted to equipment hire only excluding profit and attendance</u>				
75	3.2.2.11.1. Equipment hire for CBM (Provisional)	Prov	1	75,000.00	75,000.00
76	3.2.2.11.2. Profit and attendance of equipment hire for CBM	%		75,000.00	
	<u>3.2.3. Routine and Interval-Based Maintenance (RIM)</u>				
	<u>Material inclusive of profit and attendance as part of detailed invoice claims, providing copies of suppliers purchase invoice where rates of material were not provided and agreed on prior to the contract</u>				
76	3.2.3.3.1 Fire protection system	Prov	1	25,000.00	25,000.00
77	3.2.3.3.2 Main water network	Prov	1	45,000.00	45,000.00
78	3.2.3.3.3 Spares and lubricants for electromechanical equipment	Sum	1		
79	3.2.3.3.4 Material for infrastructure	Sum	1		
80	3.2.3.3.5 Material for grounds	Sum	1		
	<u>Labour inclusive for maintenance of components (building structures, plant, equipment and grounds) and all statutory costs, Personal Protective Equipment (PPE), profit and employee incentives throughout the duration of the contract</u>				
81	3.2.3.4.2 Groundsman (also operate machinery)	Month	12		
82	3.2.3.4.4 Other (Specify:_____)	Month	12		
	Carried Forward			R	
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Item No.		Quantity	Rate	Amount
	Brought Forward		R	
	<u>Servicing and control of electromechanical equipment and tools</u>			
83	3.2.3.5.1 Servicing and control of electromechanical equipment and tools	Month	12	
	3.3. CORRECTIVE MAINTENANCE (BREAKDOWNS)			
	3.2.2. Corrective Maintenance (CM) Material			
	<u>Material, spare parts, subcomponents and appurtenances necessary for the complete maintenance of each installation and as part of detailed invoice claims, provide copies of suppliers purchase invoice</u>			
84	3.3.2.5.1. Corrective maintenance (CM) material	Prov	1	180,000.00
85	3.3.2.5.2. Profit on CM material (%)	%		180,000.00
	3.2.2. Corrective Maintenance (CM) Labour			
	<u>Labour in the form of skilled, trained (with mechanical, electrical or electromechanical trade certificates) and support personnel for Emergency execution for CM at all hours of the day / 7 days a week, as and when an emergency arises, inclusive of all statutory costs, Personal Protective Equipment (PPE), profit and employee incentives throughout the duration of the contract</u>			
86	3.3.3.1.1. Artisan Foreman (Rate/ hr Only)	Rate	340	
87	3.3.3.1.2. Artisan (Rate/ hr Only)	Rate	340	
88	3.3.3.1.3. Semi-skilled / Artisan Assistant (Rate/ hr Onl	Rate	340	
89	3.3.3.1.4. Unskilled / General Labourer (Rate/ hr Only)	Rate	340	
90	3.3.3.1.5. Other (Specify: _____) (Rate/ hr O	Rate	340	
	Carried Forward			
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Item No.		Quantity	Rate	Amount
	Brought Forward		R	
	<u>3.3.4. Corrective Maintenance Equipment</u>			
	<u>Specialised equipment hire and tools except where otherwise provided. The Service Provider shall provide a comparative quotation from reputable equipment hiring companies where equipment is owned by their firm / company – claims shall only be restricted to equipment hire only</u>			
91	3.3.4.1.1. Vibrating Compressor, static mass 0.5t (Daily)	Rate	1	
92	3.3.4.1.2. Compressor 10.3 m3/min, tools & hoses (Daily)	Rate	1	
93	3.3.4.1.3. 50mm Water pump and hoses (Daily)	Rate	1	
94	3.3.4.1.4. Profit and attendance of equipment hire for CM (%)	%		
	<u>3.2.2. Corrective Maintenance (CM) Transport</u>			
	<u>Transport for conveying material, accessing the site and attending to emergencies as required. The travel distance to each site shall be measured from the base locations reflected on the Terms of Reference (ToR)</u>			
95	3.3.5.1.1. One (1) tonne pick-up (Rate/ km)	Rate	3120	
96	3.3.5.1.2. Five (5) tonne truck (Rate/ km)	Rate	3120	
	Carried to Summary		R	
	KWT & SURROUNDING AREAS SCHEDULE NO.3: MAINTENANCE DPWI: GQEBERHA REGIONAL OFFICE FACILITIES MANAGEMENT			

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Section No.	<u>FINAL SUMMARY</u>	Page No	Amount
A	ANNUAL CONTRACT ESCALATION NOT EXCEEDING 5%: _____ %		
1	SCHEDULE NO. 1: CONTRACT MANAGEMENT AND COMPLIANCE	5	
2	SCHEDULE NO.2: OPERATION	8	
3	SCHEDULE NO.3: MAINTENANCE	12	
	YEAR 1: TOTAL AMOUNT		
	YEAR 2: YEAR 1 + ESCALATION RATE		
	SUB-TOTAL		R
	VAT@15%		R
	Total Carried to Form of Offer		R
	KWT & SURROUNDING AREAS		
	FINAL SUMMARY		
	DPWI: GQEBERHA REGIONAL OFFICE		
	FACILITIES MANAGEMENT		