

**STATEMENT OF WORK FOR
PREVENTIVE MAINTANENCE SERVICE CONTRACT**

Water Treatment of Potable Water Systems

American Embassy at Dar es Salaam

January 2016

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Attachments

Exhibit A – Statement of Work: Potable Water Treatment System

1. INTRODUCTION

1.1 The United States Department of State (DOS) requires services at the unclassified clearance level, to provide water treatment maintenance services at the US Embassy Dar es Salaam Compound, U.S. Embassy, Dar es Salaam, Tanzania in accordance with this contract.

1.2 The water treatment systems to be maintained are as follows:

- 3 number Domestic (Potable) Water Treatment plant and 1 number Reverse Osmosis Plant.

1.3 The Overseas Buildings Operations (OBO) has a requirement to obtain water treatment maintenance services to execute this work, including logistics, customs, shipping, transportation, labor, water treatment chemicals, tools, water treatment testing kits/equipment, administrative and all associated management support functions. The water treatment service contract will include but not limited to combinations of physical methods, chemical methods, equipment servicing and testing to control water-related problems such as corrosion, scaling, general deposits, and microbiological fouling of the potable water systems. All work shall comply with the requirements described in the following, as a minimum:

- NSF Standards (National Sanitation Foundation)
- AWWA Standards (American Water Works Association) ANSI Standards
- SDS Regulations
- ASTM D
- NFPA Codes
- UL Standards
- IEEE Standards
- NEMA Standards
- OSHA Standards
- Tanzania Bureau of Standards. (TBS)
- And all applicable manufacturer O&M and installation instructions/requirements.

2. OBJECTIVES

2.1 The purpose of this scope of work is to define the requirements for the planning, procurement, and maintenance of the potable water systems located at the Embassy Compound. The intent of this service contract is to maintain the potable water and reverse osmosis water treatment plant and preserve the current piping and establish a cost effective water treatment program to control water related problems such as corrosion, scaling, general deposits, and

microbiological fouling and meet water treatment goals. All work shall be executed in accordance with the project SOW, approved water treatment chemicals, associated contract documents and be compliant with all applicable safety, equipment and building codes and standards.

3. TYPE OF CONTRACT

This is a firm fixed price contract payable entirely in Tanzanian Shillings or U.S Dollars. Prices are for all Contract Line Items. No additional sums will be payable for any escalation in the cost of materials, equipment or labor, or because of the Contractor's failure to properly estimate or accurately predict the cost or difficulty of achieving the results required. The contract price will not be adjusted due to fluctuations in currency exchange rates.

4. PERIOD OF PERFORMANCE

The contract will be for a period of one-year, with a maximum of four one-year optional periods of performance and will be expected to commence no later than May 2016.

5. PRICING

The rates below include all costs associated with providing preventive maintenance services in accordance with the attached scope of work, and the manufacturer's warranty including materials, labor, insurance (see FAR 52.228-4 and 52.228-5), overhead and profit.

5.1 Base Year. The Contractor shall provide the services shown below for the base period of 12 months.

CLIN	Description	Quantity of Equipment	Type of services	No. of service	Unit price / service (\$)	Total per year (\$)
001	Potable Water Treatment System					
001-A	Main Water Treatment Plant- 2 skids	1	Weekly	52		
001-B	Reverse Osmosis Plant	1	Weekly	52		
001-C	Residential supply – CAC3	1	Weekly	52		
001-D	Residential supply – CAC4	1	Weekly	52		
	Total Base Year					

5.2. Option Year 1. The Contractor shall provide the services shown below for Option Year 1 of the contract, and continuing for a period of 12 months.

CLIN	Description	Quantity of Equipment	Type of services	No. of service	Unit price / service (\$)	Total per year (\$)
101	Potable Water Treatment System					
101-A	Main Water Treatment Plant- 2 skids	1	Weekly	52		
101-B	Reverse Osmosis Plant	1	Weekly	52		
101-C	Residential supply – CAC3	1	Weekly	52		
101-D	Residential supply – CAC4	1	Weekly	52		
	Total Option Year 1					

5.3. Option Year 2. The Contractor shall provide the services shown below for Option Year 2 of the contract, and continuing for a period of 12 months.

CLIN	Description	Quantity of Equipment	Type of services	No. of service	Unit price / service (\$)	Total per year (\$)
201	Potable Water Treatment System					
201-A	Main Water Treatment Plant- 2 skids	1	Weekly	52		
201-B	Reverse Osmosis Plant	1	Weekly	52		
201-C	Residential supply – CAC3	1	Weekly	52		
201-D	Residential supply – CAC4	1	Weekly	52		
	Total Option Year 2					

5.4. Option Year 3. The Contractor shall provide the services shown below for Option Year 3 of the contract, and continuing for a period of 12 months

CLIN	Description	Quantity of Equipment	Type of services	No. of service	Unit price / service (\$)	Total per year (\$)
301	Potable Water Treatment System					
301-A	Main Water Treatment Plant- 2 skids	1	Weekly	52		
301-B	Reverse Osmosis Plant	1	Weekly	52		
301-C	Residential supply – CAC3	1	Weekly	52		
301-D	Residential supply – CAC4	1	Weekly	52		
	Total Option Year 3					

5.5. Option Year 4. The Contractor shall provide the services shown below for Option Year 4 of the contract, and continuing for a period of 12 months

CLIN	Description	Quantity of Equipment	Type of services	No. of service	Unit price / service (\$)	Total per year (\$)
401	Potable Water Treatment System					
401-A	Main Water Treatment Plant- 2 skids	1	Weekly	52		
401-B	Reverse Osmosis Plant	1	Weekly	52		
401-C	Residential supply – CAC3	1	Weekly	52		
401-D	Residential supply – CAC4	1	Weekly	52		
	Total Option Year 4					

5.6. Total for all years:

Base Year	TSH / \$_____
Option Year 1	TSH / \$_____
Option Year 2	TSH / \$_____
Option Year 3	TSH / \$_____
Option Year 4	TSH / \$_____
TOTAL	TSH / \$_____

5.7 Repair option. Repairs are NOT included under this agreement and are to be done outside this contract. However, we would like to have current labor rates in the event that there is an issue discovered during the preventive maintenance of the specified equipment. Please provide your current labor rates in the Repair Option fields below. Any necessary repairs or parts will be

submitted for approval and then billed against a separate purchase order (PO). The Contractor is not approved to do any additional work without approval.

Repair Labor Rates

Base Year	TSH / \$ _____/hr.
Option Year 1	TSH / \$ _____/hr.
Option Year 2	TSH / \$ _____/hr.
Option Year 3	TSH / \$ _____/hr.
Option Year 4	TSH / \$ _____/hr.

5.8 Emergency Service Option. Emergency Service is NOT included under this agreement and will be billed outside the contract. However, we would like to have the rates in the event of an emergency. Emergency Service, with a four-hour response time, must be available 24-hours per day, 365 days a year. Submit cost for Emergency Services below.

Emergency Service Rates per Trip

Base Year	TSH / \$ _____
Option Year 1	TSH / \$ _____
Option Year 2	TSH / \$ _____
Option Year 3	TSH / \$ _____
Option Year 4	TSH / \$ _____

6. NOTICE TO PROCEED

After Contract award and submission of acceptable insurance certificates and copies of all applicable licenses and permits have been provided, the Contracting Officer will issue a Notice to Proceed. The Notice to Proceed will establish a date (a minimum of ten (10) calendar days from date of Contract award unless the Contractor agrees to an earlier date) on which performance shall start.

7. GENERAL REQUIREMENTS

7.1 This statement of work (SOW) describes the preventive maintenance and testing services and deliverables to be performed by the Contractor at the Embassy Compound, U.S. Embassy Dar Es Salaam, Tanzania.

7.2 The assigned Contracting Officer and Contracting Officer's Representative are the sole

points of contact for all technical and contractual discussions or issues regarding the scope of work and its intent and execution. The Contractor shall take no direction verbal or otherwise from United States Government (USG) personnel other than the Contracting Officer or Contract Officer's Representative.

7.3 This Statement of Work requires the Contractor to provide site assessment and survey services, project management, professional water treatment services, water treatment logistics and material procurement services, preventive maintenance and testing services, cost estimating and scheduling services, and general support services for this water treatment maintenance contract.

7.4 The Contractor's proposed and USG accepted maintenance contract cost proposal and maintenance schedule, including completion dates shall be incorporated into the task order. Additionally, the task order shall be a firm fixed price task order.

7.5 This statement of work and applicable deliverables and documents as developed by the Contractor and accepted by the USG shall serve as the basis for describing and delineating the scope of the required services and work limits for service contract to be furnished and executed by the Contractor.

7.6 All deliverables, documents, proposals, etc. submitted by the Contractor under this statement of work shall remain the property of the U.S. Government. All U.S. Government documents and data provided to the Contractor shall remain the property of the U.S. Government. The Contractor shall limit duplication and dissemination of all U.S. Government documents and Contractor developed documents under this statement of work to/within the Contractor's execution team. Duplication or distribution of project documents outside the Contractor's team is strictly prohibited without the express written approval and authorization of the contracting officer.

Upon completion of each service visit all documents, electronic media, photos, etc. shall be submitted to the Government, including all documents and data the Government provided to the Contractor. All service contract documents and media shall be submitted to the Government along with the Contractor's service report.

7.7 The Contractor shall schedule, coordinate and arrange all work so as to cause the least interference with the normal occurrence of post operations. In those cases where some interference is unavoidable, the Contractor shall make every effort to minimize the impact of the interference and its effects on the occupants or users. All detailed work schedules required by this statement of work shall be electronically documented and updated and made available to the Contracting Officer's Representative (COR) upon request, oral or written. If the COR determines that the Contractor's schedule conflicts with critical post operations, the Contractor

shall modify the schedule as required.

7.8 The Contractor shall ensure that all Embassy/Post facilities, equipment and systems recommended for and maintained or installed by the Contractor are done so with the highest quality and cost effective materials, finishes, fixtures, equipment and system that provide for sustained operational reliability, dependability and durability. The Contractor shall assure that the equipment/water treatment chemicals furnished and installed are maintainable and equipment/parts can be readily replaced with locally available supplies and services as practical, taking into consideration local economy and resources. The Contractor shall utilize reliability-centered maintenance (RCM) principles and methodologies during and for all project activities and tasks. Uniformity of parts and components shall be taken into consideration to maximize part interchangeability with other existing Post systems. Except as otherwise directed by the contracting officer all parts, materials, components, equipment, systems, etc. furnished by the Contractor shall be new – not used or manufactured by third party entities. Except as otherwise directed by the contracting officer, all replacement or warranty parts shall be new and equal to or better than manufacturer recommended replacements.

7.9 After review of the US Government Statement of Work and provided technical data by the Contractor, any discrepancies, errors, conflicts, etc. that are discovered by the Contractor, the Contractor shall forward those items to the CO via written correspondence. Submittal of this written correspondence shall be completed, within 3 days upon receipt of the US Government Statement of Work.

7.9.1 The Contractor shall provide 3 customer references of similar scope of work and US Dollar value.

7.9.2 The Contractor will not use any method or substances which may cause damage to the equipment or systems. Any damage or loss through negligence and/or maintenance practices by the Contractor, Sub-contractor, or Contractor's staff shall be the entirely the responsibility of the Contractor. The U.S. Embassy, Dar es Salaam will require the Contractor to repair/replace any damaged systems or pay for the cost of rectification.

7.9.3 The Contractor must, for the duration of the contracted Services, continue to maintain a quality control process which has been agreed to by the U.S. Embassy, Dar es Salaam COR and the Contractor.

7.9.4 The Contractor shall provide the technician's resume and training documentations within 20 days of the notice to proceed.

7.9.5 The service provider must have a minimum of five (5) years of experience with the design, manufacturing, and start-up of potable water treatment plants and have provided service or start-up services to a minimum of 10 sites. The provider must be a factory authorized service provided of the installed equipment to include pumps, chlorination system. The qualified vendor must provide a compliance program to ensure the plant is operating in compliance with the manufacture's standards.”)

8. CONTRACTING OFFICER'S REPRESENTATIVE and POST CONTROL OFFICER

8.1 All technical questions concerning the scope and requirements of the U.S. Embassy, Dar es Salaam water treatment service contract shall be directed to the Contracting Officer's Representative (COR):

COR- John Rexford
Dar es Salaam-Facility Manager
refordjf@state.gov

9. PERFORMANCE CRITERIA

9.1 Performance Objective

The objective of this Agreement is to provide, within the Term of this Contract, a professional level of service, which provides:

- US Embassy satisfaction in respect to the maintenance of water treatment systems and prompt reaction to any change in arrangements or operational requirements of the US Embassy;
- compliance with the statutory and regulatory provisions of the laws of the jurisdiction;
- best in class practices within the industry;
- risk reduction for the US Embassy;
- preservation of asset value; and
- reduction in operating costs.

The Service Contractor agrees that its performance under the Contract shall be measured against performance criteria specified in this document or otherwise agreed at the time of commencement.

9.2 Performance Benchmarks

The Service Contractor must for the duration of the contracted Services continue to maintain a quality control process.

The Service Contractor must allow the US Embassy access to the quality control system as well as the relevant quality systems of its subcontractors so as to enable monitoring and quality auditing of the maintenance service.

The US Embassy may reject any aspect of the Services that fails to comply with the requirements of the Contract, or its quality system, at any time.

9.3 Performance Monitoring and Reporting

The Service Contractor shall monitor its own performance against the criteria and benchmarks identified in this document, and shall provide reports when required by the US Embassy.

10. SPECIFICATIONS

10.1 All equipment, chemicals, and testing procedures and kits shall be approved by the COR prior to use in the service contract.

10.2 The Contractor will be responsible for submitting the manufacture specifications, SDS sheets and equipment cut sheets for all equipment, chemicals (including chemical composition), and testing procedures in English language.

10.3 Potable Water Treatment System:

10.3.1 The potable water shall be maintained with the parameters specified in Exhibit A Potable Water Treatment System.

11. SAFETY HEALTH AND ENVIROMENTAL MANAGEMENT (SHEM)

11.1 The Service Contractor shall take all reasonable and proper safety precautions to prevent death or injury to any person or damage to any property at the US Embassy Dar es Salaam Compound and in particular all equipment used by the Service Contractor shall be used in such a manner and maintained so as to minimize the danger of accident, death, injury, loss or damage arising from the use of such equipment. In addition to relevant statutory requirements, standards and other provisions of this Contract, the Service Contractor shall have the following requirements:

- Numbers (CLIN) shall include proper disposal of toxic substances where applicable.
- The Service Contractor's personnel shall be knowledgeable with and adhere to all relevant occupational health and safety legislation and MSDS sheets.
- All electrical equipment and associated materials for the Services Contract comply with

UL requirements.

- Follow all NFPA guidelines against fire, production of smoke or the venting of any noxious substances
- Ensure that the Service Contractor's personnel comply with all safety procedures and requirements
- Ensure that the Service Contractor's personnel are adequately trained and instructed in the safe and correct usage, handling and operation of materials and equipment relevant to the Services and provide reasonable proof of such to the US Embassy Dar es Salaam on request.
- Ensure the Service Contractor's personnel are certified as having completed occupational health and safety training and have been issued all the necessary Personal Protection Equipment (PPE) required for safe implementation of this contract;
- Training program(s) shall be presented and must satisfy the US Embassy Dar es Salaam during the submittal process.

12. MAINTENANCE SPECIFICATION DETAILS

12.1 Precedence of Specifications. If and to the extent that there is an inconsistency between this maintenance specification and any Manufacture's maintenance specification, the Manufacture's maintenance specification shall prevail.

12.2 Hours of Work. The Service Contractor shall schedule all preventive maintenance during normal working hour which are defined as Monday to Thursday 07.30 am to 05.00pm; Friday 07.30am to 11.00am, inclusive of periodic maintenance that may be required on Saturdays, with the exception of any regular or special public holidays on which the US Embassy Compound is not open, or as agreed with the US Embassy prior to commencement of the contract.

13. SCOPE OF WORK

13.1 The water treatment Contractor shall provide both the required chemical products and necessary services to apply the chemicals, monitor their performance, and report the results. The water treatment service contract shall 1) preserve the interior waterside of current piping, 2) reduce operating costs and establish a cost effective water treatment program to control water related problems such as corrosion, scaling, general deposits, and microbiological fouling, and 3) ensure the proper operation of water treatment equipment.

13.2 The water treatment Contractor shall visit the embassy on a weekly basis (52 times a year) at 7 day consecutive intervals. The Contractor shall be responsible for all logistics including but not limited to transportation and hotel reservations for their staff.

13.3 The water treatment Contractor shall provide good chemicals and have a storage life expectancy of at least 1 year.

13.4 The water treatment Contractor shall establish minimum and maximum control ranges for each treatment chemical and avoid unnecessary high levels of chemicals to mitigate cost and adverse chemical reactions from improper high level chemical dosage.

13.5 The water treatment Contractor shall perform the required services as described in the following SOW attachments, as applicable:

Exhibit A – Potable Water Treatment System

13.6 The water treatment Contractor shall provide 52 hours of familiarization annually in both English and Kiswahili to acquaint operators in the necessary water treatment tests, the control ranges for each treatment chemical, safe handling of equipment and chemicals, and new water treatment procedures/technologies.

13.7 The water treatment Contractor shall discuss the water treatment conditions with the Facility Manager and operating engineers on a monthly basis and follow up with a written monthly service report within 10 business days after each month. The report shall be in English and contain the results of water treatment Contractor's on-site and laboratory tests, comment on the status of each system, and specific recommendations for action if necessary.

14. ACCESS TO GOVERNMENT BUILDINGS AND STANDARDS OF CONDUCT

14.1 The Contractor shall designate a representative who shall supervise the Contractor's technicians and be the Contractor's liaison with the US Embassy Dar Es Salaam. The Contractor's employees shall be on-site only for contractual duties and not for any other business or purposes. Contractor employees shall have access to the systems dedicated rooms with or without security escorts, only with specific permission by the Facility Manager, Contracting Officer, or the COR.

14.2 Personnel security: The US Embassy reserves the right to deny access to U.S owned and U.S.-operated facilities to any individual. The Contractor shall provide the names, biographic data and police clearance on all Contractor personnel, who shall be used on this contract prior to their utilization on this contract.

14.3 Standards of Conduct.

14.3.1 General: The Contractor shall maintain satisfactory standards of employee competency, conduct, cleanliness, appearance, and integrity and shall be responsible for taking such disciplinary action with respect to employees as necessary. Each Contractor employee shall

adhere to standards of conduct that reflect credit on themselves, their employer, and the United States Government. The US Embassy reserves the right to direct the Contractor to remove an employee from the worksite for failure to comply with the standards of conduct. The Contractor shall immediately replace such an employee to maintain continuity of services at no additional cost to the Government.

14.3.2 Uniforms and Personal Equipment. The Contractor's employees shall wear clean, neat and complete uniforms when on duty. The Contractor shall provide, to each employee and supervisor, uniforms and personal equipment. The Contractor shall be responsible for the cost of purchasing, cleaning, pressing, and repair of the uniforms.

14.3.3 Neglect of Duties. Neglect of duties shall not be condoned. This includes sleeping while on duty, unreasonable delays or failures to carry out assigned tasks, conducting personal affairs during duty hours and refusing to render assistance or cooperate in upholding the integrity of the worksite security.

14.3.4 Intoxicants and Narcotics. The Contractor shall not allow its employees while on duty to possess, sell, consume, or be under the influence of intoxicants, drugs or substances which produce similar effects.

EXHIBIT A**Statement of Work****Potable Water Treatment System****I. GENERAL INFORMATION:**

The United States Embassy in Dar es salaam requires professional services and contractor cost proposals to perform preventive maintenance services of the facility's Potable Water Treatment System.

II. DESCRIPTION OF EQUIPMENT:

AA. The main water treatment plant consists of two skid mounted units containing the following equipment – for treating water supply from the utility

1. Skid #1 – two each stainless steel bag filters, a 1100 gallon polyethylene water storage tanks with level switches to receive utility water supply, two booster pumps with one on line and one on stand-by, two manganese greensand filter tanks and a back wash pump.
2. Skid # 2 – chemical feed system with chlorine storage tank, dosing pump and monitoring system.

BB. Reverse Osmosis plant – One unit Reverse osmosis plant type ProMinent PRO 5.5.8040-ESPA2 Including all components on the RO plant; all control instruments, feed water conditioning system and RO plant feed pumps. Treating water from bore holes on the compound.

CC. Residential water supply storage and truck fill stations – 2 units one each at CAC3 and CAC4 support compound. Both CAC3 and CAC4 receive water from the utility and goes through sand filtration, chlorine dozing and finally into storage tanks.

III. GENERAL REQUIREMENTS:

The Contractor under this SOW will be responsible for labor, tools, and materials required to carry out all preventive maintenance as outlined in this SOW. Embassy staff have service manuals for all equipment included in this SOW.

IV. SCOPE OF WORK - PREVENTIVE MAINTENANCE

Contractor shall provide all materials, supervision, labor, tools and equipment to perform preventive maintenance. All personnel working in the vicinity shall wear and /or use safety protection while all work is performed. Any questions or injuries **will** be brought to the attention of the COR. Safety Data Sheets (SDS) shall be provided by the Contractor for all HAZMAT materials. Copies will be provided to the COR for approval.

At a minimum, the following work must be done:

Weekly:

The Service program shall consist of the contractor's staff conducting routine (weekly) operator testing of the potable water treatment systems and monthly e-mailing the results to the COR. The Contractor will then be responsible for conducting a technical analysis of the routine potable water treatment testing results from the embassy. The Contractor will then respond to the embassy within 24 hours to make any changes to the treatment plant operations to reestablish effective and efficient potable water treatment to meet water quality standards.

Potable Water Treatment Plant

- i. Maintenance Description:
 1. Check and record pressures and chemical levels.
 2. Replace chemical dosing detection probes
 3. Replace / change bag filters
 4. Back wash the filter media
- ii. Safety and Special Handling Description:
 1. Chemicals must comply with the Environmental Protection Agency (EPA) regulations, ANSI/NSF Standard 60 Certification and be handled in accordance with occupational safety requirements. Employ personal protection against corrosive or hazardous treatment chemicals as appropriate.
 2. Be familiar with the Safety Data Sheets of any chemicals used in the water treatment program
 3. Assure that post maintenance staff understands the proper operation and maintenance of the equipment.
 4. Water treatment must be based on proven standard engineering practices and stipulated local standards.
 5. Follow treatment as directed by manufacturer.
 6. Maintenance includes chemicals, chemical feeding, maintaining proper water conditions, controlling bleed off, protecting idle equipment, and record-,keeping
 7. Ensure chemicals are properly stored at the contractor's warehouse, test equipment clean, and that chemicals have not passed expiration date.
 8. All tests shall conform to the manufacturer test procedures and standard values.
 9. Maintain records and test results
- iii. Maintenance Procedures:
 1. Review daily logs for trends
 2. Check chemical levels in the chemical addition tanks. Adjust chemical level and clean tank if necessary.
 3. Check system for any signs of leakage
 4. Check all tubing for tightness

5. Inspect and clean metering pumps:
 - a. Check the pump diaphragm for damage, clean if needed.
 - b. Check chemical seepage at vent hole.
 - c. Check that the discharge tubing is connected firmly to the liquid end.
 - d. Check that the liquid end is generally watertight (especially vent hole)
 - e. Check for correct feed.
 - f. Check electrical connections for wear.
6. Replace the sensors (pH, chlorine, as applicable).
 - a. Clean filters, flow cell, and fittings.
7. Calibrate the new sensors.
8. Check chemical addition tanks to ensure no damage or leakage.
9. Test unit safety functions:
 - a. Ensure the alarm relay works.
 - b. Check the function of the flow sensor and ensure the controller stops.
10. Wipe down the unit.
11. Verify maintenance records for all components of the water treatment system.
12. Check total and free chlorine and pH in all domestic water tanks.

Quarterly (4 times per year):

Booster, back wash, transfer and truck fill Pumps

- i. Safety & Special Instructions:
 1. Perform applicable lockout/tag-out steps of site safety procedures.
 2. Schedule outage with operating personnel.
 3. Follow site and manufacturer's safety procedures.
 4. Record and report equipment damage or deficiencies.
 5. Obtain and review manufacturer operation and maintenance instructions.
 6. All tests shall conform to the manufacturer test procedures and standard values.
- ii. Maintenance Description:
 1. Clean and inspect all the pumps.
 2. Clean and inspect motor.
 3. Lubricate motor.
- iii. Maintenance Procedures:
 1. Tag out unit.
 2. Clean and inspect pump.
 - a. Clean accumulated dirt and grime from pump casing, shaft coupling, and motor.
 - b. Inspect electrical wiring, motor, and controls for signs of over-heating, broken insulation, loose or corroded connections, or damaged conduit.
 - c. Check for evidence of leaks.
 - d. Check alignment of coupling and security of base-plate mounting bolts.
 3. Lubricate pump (if applicable).
 4. Conduct operational test of the circulating pump.

- a. Start pump. Check flanges and fittings for leaks.
 - b. Check for unusual noise or vibration.
 - c. Return the unit to service.
5. Check the motor.
- a. Inspect electrical wiring, motor, and controls for signs of over-heating, broken insulation, loose or corroded connections, or damaged conduit.
 - b. Meggar check motor, record results.
 - c. Check running current and voltage for each phase, record results.
6. Lubricate the motor (if applicable). NOTES: DO NOT OVERGREASE THE MOTOR. USE MOTOR RATED GREASE. DO NOT USE PUMP GREASE IN THE MOTOR.

Semi-Annually:**Potable Water Treatment System**

(In addition to all quarterly maintenance described above)

- i. Safety & Special Instructions:
 1. Schedule outage with operating personnel.
 2. Follow site and manufacturer's safety procedures.
 3. Record and report any equipment damage or deficiencies found during this maintenance task.
 4. Record all test results in the component maintenance log.
 5. Obtain and review manufacturers operation and maintenance instructions.
- ii. Maintenance Description:
 1. Check the system for proper performance.
 2. Service the system.
 3. Check the backwash flow controller for proper operation.
 4. Evaluate filter media for replacement (as applicable)
- iii. Maintenance Procedures (General)
 1. Cycle the backwash flow controller and verify proper operation (as applicable).
 2. Evaluate any media for replacement.
 3. Conduct water quality testing by certified laboratory to verify maintenance of water quality treatment goals as specified by section 10 of this contract. Have treated water tested by a certified laboratory for an analysis of the following parameters: pH, alkalinity, aluminum, calcium, copper, bromide, fluoride, nitrite, nitrate, orthophosphate, silica, strontium, iron, manganese, lead, magnesium, sodium, chloride, total hardness, total dissolved solids (TDS), turbidity, free chlorine, coliform bacteria, HPC, and temperature.
Number of water taps to be sampled- 4 ; samples from - 1.Cafeteria kitchen; 2. American club kitchen; 3.USAID kitchenette on level 2 and 4.CACI water drinking fountain.
- iv. Maintenance Procedures
 1. Check backwash filter
 2. Check softening

3. Flush softening
4. Check dosage/metering
5. Adjust dosage/metering
6. Measure water hardness and adjust system to achieve desired hardness level.
7. Measure water conductivity
8. Measure water pH number
9. Check pressure gauges for proper operation
10. Check density of brine solution in salt tank
11. Check operation of float control in brine
12. Inspect water softening piping, fittings and valves for leaks
13. Lubricate valves and motors
14. Inspect softener base and brine tank for corrosion and repair as needed
15. Check operation of automatic fill valve in brine tank
16. Check electrical wiring and phasing
17. Check cleanliness
18. Check control system
19. Check system functioning
20. Measure turbidity, free chlorine residual, iron, manganese, total dissolved solids (TDS), alkalinity, and temperature of finished water

Controllers: Chemical and Other Treatment Processes (for example: Chlorine addition, Reverse Osmosis (R/O) treatment, pH adjustment, corrosion inhibitor addition), and Pumps (Circulation and Well)

- i. Safety & Special Instructions
 1. Schedule outage with operating personnel.
 2. Perform applicable lockout/tag-out steps of site safety procedures.
 3. Record and report equipment damage or deficiencies.
 4. Review and follow the manufacturer OM instructions.
 5. Record results in the equipment history log.
- ii. Maintenance Description:
 1. Clean and inspect controller.
 2. Operational test controller.
- iii. Maintenance Procedures:
 1. Visually inspect for broken parts, contact arcing, or any evidence of overheating.
 2. Check line and load connections for tightness (check manufacturer instructions for torque specifications).
 3. Check mounting screws for tightness.
 4. Check all control wiring connections for tightness.
 5. Check all timers/clocks for proper operation.

6. Clean interior and exterior of cabinet.
7. Energize circuit and check operation of the controller. Verify each controlled circuit operates properly.
8. Replace burned out pilot lights. Check alarm and remote indicators where applicable.
9. Evaluate UPS Power supplies for replacement.

Pump, Water (Submersible)

- i. Safety & Special Instructions:
 1. Schedule outage with operating personnel.
 2. Follow site and manufacturer's safety procedures.
 3. Record and report any equipment damage or deficiencies found while performing this maintenance task.
 4. Record all test results in the component maintenance log.
 5. Obtain and review manufacturer operating and maintenance instructions.
 6. All tests shall conform to the manufacturers test procedures and standard values.
- ii. Maintenance Description:
 1. Test the pump. (Annual)
- iii. Maintenance Procedures:
 1. Inspect electrical wiring for damage.
 2. For recirculation pumps, verify pump is pumping at capacity.
 3. For jockey pumps, verify pump is pumping at the required pressure.
 4. Measure actual current draw and compare to nameplate readings.
 5. Measure voltage at the pump and compare to nameplate readings.
 6. Meggar test the motor.

RO Plant

1. Check for general condition and operation.
2. Check operation of pretreatment system.
3. Check operating pressure, temperature, control device and record to monitor RO plant performance.
4. Check for water leaks and repair.
5. Replacement of cartridge filters
6. Filing of chemicals for dosing tanks
7. Chemical cleaning of RO membrane when required
8. Water analysis of raw water after every 2 visits to set up the dosing rate
9. General cleanliness of the plant and plant room
10. Remove debris from work-site

Water Wells

- i. Safety & Special Instructions:

1. Schedule work with operating personnel.
2. Follow site and manufacturer's safety procedures.
3. Record and report any equipment damage or deficiencies found during this maintenance task.
4. Record all test results in the component maintenance log.
5. Obtain and review manufacturer operation and maintenance instructions.
- ii. Maintenance Description:
 1. Inspect the well-head casing and seals for cleanliness and water tightness integrity.
 2. Perform a water chemistry and bacterial test.
- iii. Maintenance Procedures:
 1. Note any sources of potential well contamination and verify chemicals, fertilizers, fuel or oil, paint, etc., are not stored near the well. Maintain clearance of 50 to 100 feet between the well and buildings, parked cars or other vehicles, etc.
 2. Check the well cover or well cap on top of the well casing to ensure it is in good repair.
 3. Check that the casing is free of cracks.
 4. Check that the sanitary seal is secure and watertight.
 5. Check that the ground slopes away from the well for at least 15 feet in all directions.
 6. Check all backflow preventers and anti-siphon devices to ensure water is not siphoning back into the well.
 7. Provide backflow annual certification test.
 8. Sample the well and send to a certified laboratory for chemical and bacteriological analysis. Bacteriological tests to include: total coliform, fecal coliform, E. coli, and heterotrophic plate count (HPC) bacteria. Chemical/Physical tests to include: pH, alkalinity, total dissolved solids (TDS), turbidity, total iron (Fe), total manganese (Mn), nitrate, nitrite, total hardness, and ammonia.

Water Tanks with Controls (Above and Underground)

- i. Safety & Special Instructions:
 1. Perform applicable lockout/tag-out steps of site safety procedures to ensure machinery will not start.
 2. Schedule outage with operating personnel.
 3. Follow site and manufacturer's safety procedures.
 4. Record and report to the post any equipment damage or deficiencies found while performing this maintenance task.
 5. Record all test results in the component maintenance log.
 6. Obtain and review manufacturer operation and maintenance instructions.
 7. All tests shall conform to the manufacturer test procedures and standard values.
- ii. Maintenance Description:
 1. Test operation of sluice gate.

2. Operational test of the water tank
3. Test operation of controls.
- iii. Maintenance Procedures:
 1. Examine visible interior of tank including fittings, hatches, ladders, manholes, and hand-holes for signs of corrosion, and correct as indicated.
 2. Clean, test and inspect sight glasses, valves, fittings, drains and controls.
 3. Clean and inspect tank level control panel.
 - a. Clean exterior of panel and inspect front panel components for damage.
 - b. Clean interior panel components of dust and foreign material.
 - c. Inspect electrical wiring for damage and loose connections.
 - d. Inspect relays for damaged contacts and signs of over-heating.
 4. Operational Test panel/electronic control units and mechanical level control equipment.
 - a. Verify that all alarm, control, and communication circuits operate correctly.
 - b. Verify that mechanical level indicating and control devices are functioning properly.
 5. Look for presence of contamination (bugs, frogs, snakes, paper, plastic, etc.). Notify the COR if found.
 6. Tanks should be drained, cleaned, and disinfected as per current U.S. Department of State Guidelines (ALDAC 137958).
 7. Return system to service.

The water treatment Contractor shall determine the dosage levels of chemicals and stay within the specified operating parameters:

Parameters	Maintenance Levels
<i>For Maintenance of Potable Water Quality Treatment Goals</i>	
Chlorine Residual	0.2 – 0.5 mg/L in all parts of the distribution system
Microbiological and Chemical constituents	Treated water meets U.S. Environmental Protection Agency Primary and Secondary Drinking Water Regulations (40 CFR Parts 141-143)
<i>For Maintenance of Piping and Equipment</i>	
Corrosion on mild steel	Less than 2.0 mpy
Pitting attack on mild steel	None
Corrosion on copper alloys	Less than 0.2 mpy
Scaling and deposition	None
Microbiological fouling	<ol style="list-style-type: none"> 1. No visible deposits 2. No health hazards 3. Total Heterotrophic Plate Count (HPC)

	less than 500/CFU
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Potable Water Treatment System Components and Equipment List

Water Treatment Skids/Equipment

Filtration and Membranes	Manufacturer	Model	Number	Brief Description	Location
Bag Filtration	Rosedale	8	2	150PSIG rated filter unit	WTP
Cartridge Filtration	Ametek	#20 Big Blue	1	25 micron	RO plant
Reverse Osmosis (R/O)	ProMinent	PRO5.5.8040 ESPA 2	1	flow rate 5mcu/hr op pressure 18 bar recovery 75%	RO plant
Merrywater sand filter	Fiber pool		2		CAC3 and CAC4
Manganese Greensand Filter	Lakeside water treatment		1	36in x60in sideshell non coded pressure vessel containing Manganese greensand and Anthracite filter media.	Water treatment plant (WTP)

Chemical	Manufacturer	Make	Model	Number	Chemical [liquid (sodium) or solid (calcium) hypochlorite]	Location
Chlorination	Chemtrol	CH255	255ppm/ph controller	1	Sodium Hypochlorite	WTP
pH Adjustment	Chemtrol	CH255	255ppm/ph controller	1	Sodium Hypochlorite	WTP

Storage	Number of Tanks	Type (bladder pressure or atmospheric)	Material	Volume	Location (above or below ground)
Raw Water Storage	1	atmospheric	polyethylene	1100gal	Above; WTP

Finished Water Storage	2	atmospheric	concrete	2x70,000gal	Below; chancellery
Finished water storage Residential supply	1	atmospheric	GRP – ex Merrywater	90,000lts	Above – CAC3
raw water storage Residential supply	1	atmospheric	concrete	10,000lts	Below - chancellery
raw water storage Residential supply	1	atmospheric	Polyethylene Ex Simtanks	4x15,000lts = 60,000lts	Above – CAC4
Finished water storage Residential supply	1	atmospheric	Polyethylene Ex Simtanks	4x 10,000lts = 40,000lts	Above – CAC4

Pumps	Manufacturer	Model Number	Serial Number	Capacity	Electrical
Well	Lowara	12GS15T		9m ³ /hr; H-30m	400/3/50
Booster	Goulds pumps	3656		2.2kw; 2900rpm	400/3/50
Chemical metering	ProMinent Dosing pump	DT4a 7 BT5a		Metering pump	200-230v
Back wash	Goulds pumps	3656		1.1kw; 2900rpm	400/3/50
Transfer /feed pumps	Lowara	SHE32-160/15		14m ³ /hr; H-20m	400/3/50