



Republic of the Philippines
Department of Agriculture
BUREAU OF SOILS AND WATER MANAGEMENT
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BSWM- BIDS AND AWARDS COMMITTEE
SUPPLEMENTAL BID BULLETIN NO. 1

CONTRACT: Re-Bid-Provision for Maintenance of the Submerge Membrane Bioreactor (SMBR) for CY 2024- IB NO: BSWM-2024-02-0026

This Addendum is being issued in accordance with Section 22.5.2 of the IRR of RA 9184, to clarify and modify some provisions of the Bidding Document. **THIS SHALL FORM AN INTEGRAL PART OF THE BID DOCUMENT. Likewise, the succeeding agreements and reminders were discussed during the Pre-Bid Conference held last February 29, 2024 at the BSWM Function Room and via Videoconferencing-Zoom.**

AMENDMENTS OF THE BIDDING DOCUMENT:

| ORIGINAL | AMENDED |
|---|--|
| Section III. Bid Data Sheet | Section III. Bid Data Sheet |
| Clause 5.3 | Clause 5.3 |
| a. Contract on Maintenance of Submerged Membrane Bio-reactor (SMBR) or Wastewater Treatment System and/or its equivalent. | a. Contract on Maintenance of Submerged Membrane Bio-reactor (SMBR) or Wastewater Treatment System using a Silicon Carbide (SiC) membrane |
| b. completed within five years prior to the deadline for the submission and receipt of bids. | b. completed within five years prior to the deadline for the submission and receipt of bids. |
| | Additional requirement as part of technical proposal: |
| | 1. Certificate of Site Inspection |
| | Schedule of Site Inspection: Within march 4-12, 2024- 8:00AM- 3:00PM |
| | Location: BSWM, Diliman, Quezon City |
| | Please coordinate with Mr. Crisaldo C. Solano, Head, BSWM Building and Ground Administration at 8-529-7640 loc 106 or email us at bac@bswm.da.gov.ph |
| | Please see attached Revised Section VII. Terms of Reference as Annex C |

REMINDERS DURING THE PRE-BID CONFERENCE:

RA 9184 Section 30.1:

Bidding will be conducted through open competitive bidding procedures using a non-discretionary “pass/fail” criterion as specified in the Implementing Rules and Regulations (IRR) of Republic Act (RA) 9184, otherwise known as the “Government Procurement Reform Act”.

“Any lacking document can cause the submitted bid be automatically rated failed.”

GPPB Resolution No. 15-2021 dated October 14, 2021

For the purpose of updating the Certificate of Registration and Membership, **all Class “A” eligibility documents** mentioned in Section 8.5, supporting the veracity, authenticity and validity of the Certificate



shall remain current and updated. The failure by the prospective bidder to update its Certificate with the current and updated Class “A” eligibility documents shall result in the automatic suspension of the validity of its Certificate until such time that all of the expired Class “A” eligibility documents has been updated.

- Below are the **acceptable forms of bid security** that bidders may opt to use, **which shall include the Bid Securing Declaration**. The amount of which shall not be less than the required percentage of the ABC in accordance with the following schedule:

| Form of Bid Security | Amount of Bid Security (Not less than the required Percentage of the ABC) |
|---|---|
| Cash or cashier’s/manager’s check issued by a Universal or Commercial Bank. | Two percent (2%) |
| Bank draft/guarantee or irrevocable letter of credit issued by a Universal or Commercial Bank: Provided, however, that it shall be confirmed or authenticated by a Universal or Commercial Bank, if issued by a foreign bank. | Two percent (2%) |
| Surety bond callable upon demand issued by a surety or insurance company duly certified by the Insurance Commission as authorized to issue such security. | Five percent (5%) |
| Bid Securing Declaration (Signed and Notarized) | |

NOTE: Bidders SHALL use ATTACHED template of Bid Securing Declaration.

Other forms of Bid Securing Declaration will NOT BE ACCEPTED and SHALL BE RATED “FAILED”.

- Net Financial Contracting Capacity (NFCC):

The computation of a prospective bidder’s NFCC must be **at least equal to the ABC to be bid or, for procurement by lot, at least equal to the sum of all the ABCs of lots to which it participated.**

NFCC= Current assets minus current liabilities multiplied by 15 (constant factor) minus the value of all outstanding or uncompleted portions of on-going contracts, including awarded contract/s yet to be started, coinciding with the contract to be bid.

Important Reminders:

Supplier **shall coordinate with the End-user and Property Management Unit for final schedule of delivery.**

To schedule the delivery, please click this link or scan the QR code:

<https://sites.google.com/view/pmu-scheduleofdelivery/home>



Sealing and Marking of Bid:

The bidders shall submit:

- ✓ One (1) ORIGINAL COPY.
- ✓ One (1) DUPLICATE COPY.
- ✓ One (1) PDF COPY in a USB – to be placed inside the Duplicate Copy of Technical Proposal and Duplicate Copy of Financial Proposal.

NOTE:

- All photocopied documents must be stamped and signed “Certified True Copy”.
- And all pages/documents must be duly signed by the authorized representative (both original and duplicate copies).
- For easy reference, all bidders are requested to provide dog-ear codes/ tabs in the presentation of their documents.

Reminders:

- Bidders responsibility to read, study, and review the Bidding Document and Bid Bulletin/s of the procurement project.
- Further clarification/s on the Bidding Document shall be in writing and must be submitted 10 days before the Opening of Bids.
- All bidders who wish to join the bidding shall download the attached document from PhilGEPS website to be included in the Document Request List (DRL).
- Bidders may download the updated Bidding Forms at GPPB Website (<https://www.gppb.gov.ph/downloadables.php>).
- In case of withdrawal of submitted bid, a letter stating their intention to withdraw from the project should be submitted by the bidder not later than the scheduled deadline of submission and opening of bids.
- Bidders declared to have the Lowest/ Single Calculated Bid will be subject for Post-qualification.
- Bidder shall submit the additional requirements listed on the NOTICE as LCB/ SCB within five (5) calendar days from receipt of Notice for Post qualification. Non-compliance can be grounds for post-disqualification.
- Winning Bidders declared to have the Lowest/Single Calculated and Responsive Bid shall submit its Performance Bond and Signed Contract Agreement within ten (10) calendar days from receipt of Notice of Award. Non-compliance can be grounds for forfeiture of award.
- Bidders shall comply **STRICTLY** with Section VI. Schedule of Requirement

Note:

NO EXTENSION shall be accepted/ entertained except on meritorious grounds. Late delivery without approved extension request shall be liable for liquidation damages in accordance with Section 3.1 Annex D of RA 9184.

Letter of extension shall receive by the BAC Secretariat before the lapse of the original delivery requirement.

Clause 4. Section II. Instruction to Bidders: Corrupt, Fraudulent, Collusive, and Coercive Practices

The Procuring Entity, as well as the Bidders and Suppliers, shall observe the highest standard of ethics during the procurement and execution of the contract. They or through an agent shall not engage in corrupt, fraudulent, collusive, coercive, and obstructive practices defined under Annex “I” of the 2016 revised IRR of RA No. 9184 or other integrity violations in competing for the Project.

A complete set of Bidding Document may be acquired by interested Bidders until **March 13, 2024 3:00PM** from the address and website.

DEADLINE/SCHEDULE OF SUBMISSION AND OPENING OF BIDS:

Deadline of submission of bid proposals is on **March 14, 2024, 9:00AM**. Late submission shall not be accepted.

Opening of Bids is on **March 14, 2024, 9:30AM** at BSWM Convention Hall and via videoconferencing

For guidance and information of all concerned.

(Sgd)DENISE A. SOLANO
BAC Chairperson



ANNEX A

BSWM Bid Securing Declaration Form

[shall be submitted with the Bid if bidder opts to provide this form of Bid Security]

REPUBLIC OF THE PHILIPPINES)
CITY OF _____) S.S

BID SECURING DECLARATION

Project Identification No.: [Insert number]

To: [Insert name and address of the Procuring Entity]

I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Bid Security, which may be in the form of a Bid Securing Declaration.
2. I/We shall furnish the required performance security within ten (10) calendar days in/ Case of receipt of Notice of Award (pursuant to GPPB Circular No. 04-2020 and GPPB Resolution No. 16-2020).
3. I/We accept that: (a) I/we will be automatically disqualified from bidding for any procurement contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting Order; and, (b) I/we will pay the applicable fine provided under Section 6 of the Guidelines on the Use of Bid Securing Declaration, within fifteen (15) days from receipt of the written demand by the procuring entity for the commission of acts resulting to the enforcement of the bid securing declaration under Sections 23.1(b), 34.2, 40.1 and 69.1, except 69.1(f), of the IRR of RA No. 9184; without prejudice to other legal action the government may undertake.
4. I/We understand that this Bid Securing Declaration shall cease to be valid on the following circumstances:
 - a. Upon expiration of the bid validity period, or any extension thereof pursuant to your request;
 - b. I am/we are declared ineligible or post-disqualified upon receipt of your notice to such effect, and (i) I/we failed to timely file a request for reconsideration or (ii) I/we filed a waiver to avail of said right; and
 - c. I am/we are declared the bidder with the Lowest Calculated Responsive Bid, and I/we have furnished the performance security and signed the Contract.

IN WITNESS WHEREOF, I/We have hereunto set my/our hand/s this _____ day
of [month] [year] at [place of execution].

[Insert NAME OF BIDDER OR ITS AUTHORIZED
REPRESENTATIVE]

[Insert signatory's legal capacity]
Affiant

[Jurat]

[Format shall be based on the latest Rules on Notarial Practice]

ANNEX B

Omnibus Sworn Statement (Revised)

[shall be submitted with the Bid]

REPUBLIC OF THE PHILIPPINES)
CITY/MUNICIPALITY OF _____) S.S.

AFFIDAVIT

I, [Name of Affiant], of legal age, [Civil Status], [Nationality], and residing at [Address of Affiant], after having been duly sworn in accordance with law, do hereby depose and state that:

1. *[Select one, delete the other:]*

[If a sole proprietorship:] I am the sole proprietor or authorized representative of [Name of Bidder] with office address at [address of Bidder];

[If a partnership, corporation, cooperative, or joint venture:] I am the duly authorized and designated representative of [Name of Bidder] with office address at [address of Bidder];

2. *[Select one, delete the other:]*

[If a sole proprietorship:] As the owner and sole proprietor, or authorized representative of [Name of Bidder], I have full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached duly notarized Special Power of Attorney;

[If a partnership, corporation, cooperative, or joint venture:] I am granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached [state title of attached document showing proof of authorization (e.g., duly notarized Secretary's Certificate, Board/Partnership Resolution, or Special Power of Attorney, whichever is applicable)];

3. [Name of Bidder] is not "blacklisted" or barred from bidding by the Government of the Philippines or any of its agencies, offices, corporations, or Local Government Units, foreign government/foreign or international financing institution whose blacklisting rules have been recognized by the Government Procurement Policy Board, **by itself or by relation, membership, association, affiliation, or controlling interest with another blacklisted person or entity as defined and provided for in the Uniform Guidelines on Blacklisting;**

4. Each of the documents submitted in satisfaction of the bidding requirements is an authentic copy of the original, complete, and all statements and information provided therein are true and correct;

5. [Name of Bidder] is authorizing the Head of the Procuring Entity or its duly authorized representative(s) to verify all the documents submitted;

6. *[Select one, delete the rest:]*

[If a sole proprietorship:] The owner or sole proprietor is not related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

[If a partnership or cooperative:] None of the officers and members of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

[If a corporation or joint venture:] None of the officers, directors, and controlling stockholders of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. *[Name of Bidder]* complies with existing labor laws and standards; and
8. *[Name of Bidder]* is aware of and has undertaken the responsibilities as a Bidder in compliance with the Philippine Bidding Documents, which includes:
 - a. Carefully examining all of the Bidding Documents;
 - b. Acknowledging all conditions, local or otherwise, affecting the implementation of the Contract;
 - c. Making an estimate of the facilities available and needed for the contract to be bid, if any; and
 - d. Inquiring or securing Supplemental/Bid Bulletin(s) issued for the *[Name of the Project]*.
9. *[Name of Bidder]* did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.
10. **In case advance payment was made or given, failure to perform or deliver any of the obligations and undertakings in the contract shall be sufficient grounds to constitute criminal liability for Swindling (Estafa) or the commission of fraud with unfaithfulness or abuse of confidence through misappropriating or converting any payment received by a person or entity under an obligation involving the duty to deliver certain goods or services, to the prejudice of the public and the government of the Philippines pursuant to Article 315 of Act No. 3815 s. 1930, as amended, or the Revised Penal Code.**

IN WITNESS WHEREOF, I have hereunto set my hand this ___ day of ___, 20___ at _____, Philippines.

[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]

[Insert signatory's legal capacity]
Affiant

[Jurat]

[Format shall be based on the latest Rules on Notarial Practice]

ANNEX C

Terms of Reference

Maintenance of the Submerged Membrane Bioreactor (SMBR)

A. BACKGROUND

The Bureau of Soils and Water Management (BSWM) has acquired a Wastewater Treatment System using Submerged Membrane Bioreactor (SMBR) technology with Silicon Carbide (SiC) membrane to treat the wastewater being generated by its laboratory and its existing sewerage system. SMBR system is one of the most advanced biological wastewater treatment system in terms of the quality of treated water that it can produce. The treated water can be reused for toilet flushing, garden irrigation, firefighting water, etc.

The whole SMBR system is composed of the Equalization and Neutralization Tank, Aeration Tank, Membrane Tank, Waste Activated Sludge (WAS) Tank, Effluent Tank, aeration and pumping equipment, pipelines, measuring instruments, Silicon Carbide (SiC) membrane filter and protection interlock system. This state-of-the-art SMBR system is expected to have a useful life of fifteen (15) years with a good maintenance program in place.

It is critical that a maintenance program is performed to the whole SMBR system through an annual maintenance contract. The supplier shall be tasked to carry out the implementation of the maintenance program of the whole system, taking into consideration that intricate knowledge and skills are required to lengthen the useful life of the Silicon Carbide (SiC) membrane filter, which is the most expensive component of the whole system. The supplier shall provide the skilled manpower, tools, consumables, and other resources necessary to carry out the maintenance program of the SMBR system.

B. OBJECTIVE

The objective of the contract is for the service provider to conduct site visitations to perform equipment checks and maintenance activities and to conduct water sampling and analysis of the influent and effluent of the SMBR system of BSWM. This is to ensure that the SMBR system is operating properly and breakdown of equipment are prevented.

C. SCOPE OF WORK

The maintenance program is focused on five (5) main areas:

1. To analyze gathered data from the operation of the facility and advise the BSWM on the existing concerns related to the operation of the SMBR system;
2. To execute the specific maintenance requirement for each component of the SMBR system;
3. To provide supervision, expert and skilled manpower for the implementation of the maintenance program;
4. To provide cleaning materials, tools, equipment, consumables, including chemicals for the SiC membrane filter cleaning and motor lubrication; and
5. To advise the BSWM regarding the required procurement of spares and replacement parts.

D. MAINTENANCE PROCEDURE

1. Interior and Exterior of the Facility

1.1. The interior and exterior portions of the SMBR Wastewater Treatment System shall be inspected. Rusty parts must be repainted and broken or damaged components shall be repaired or replaced immediately.

1.2. The expected output of this maintenance is to ensure that the metal parts of the SMBR system will last and not be damaged by corrosion. Furthermore, this is also to ensure that the whole SMBR system will be working properly and as designed.

2. Equalization and Neutralization Tank

2.1. To maintain the Equalization and Neutralization Tank, these are the steps to be done:

- a) Open the manhole covers and check for accumulation of solids and other waste materials;
- b) Check the level of the wastewater;
- c) Check the condition of the float sensors. Test its functionality and interlocking function through the main control panel. Thoroughly clean the surface of the float switch;
- d) If there's uneven aeration, check the condition of the diffusers. Drain the tank by treating continuously and reducing the level of the tank until the diffusers are exposed. Declog and clean the diffusers by soaking it in 0.5% sodium hypochlorite (NaOCl) solution. Ensure that the diffusers are properly tightened after placing it back in the diffuser manifold.

2.2. The expected output of this maintenance is to ensure that the level sensors and diffusers of the Equalization and Neutralization Tank are working properly.

3. Aeration Tank

3.1. The Aeration Tank is where the biological degradation of wastewater is happening. Therefore, it is very critical that it is always working properly. The maintenance steps for the tank:

- a) Open the manhole cover and check the level of the wastewater;
- b) Check the condition of the float sensors. Test its functionality and interlocking function through the main control panel. Thoroughly clean the surface of the float switch;
- c) If there's uneven aeration, check the condition of the diffusers. Drain the tank by treating continuously and reducing the level of the tank until the diffusers are exposed. Declog and clean the diffusers by soaking it in 0.5% sodium hypochlorite (NaOCl) solution. Ensure that the diffusers are properly tightened after placing it back in the diffuser manifold.

3.2. The expected output of this maintenance is to ensure that the level sensors and diffusers of the Aeration Tank are working properly.

4. Pumps (6 units)

4.1. To ensure that the process of the SMBR system is working properly, all pumps must be maintained to prevent downtime. The maintenance steps to be conducted:

- a) Check the oil level. Change oil if it's no longer transparent;
- b) Inspect the cable entry;
- c) Inspect for leakage especially when the pump has been in use for a long time;
- d) Inspect the housing of the motor;
- e) Unscrew the inspection plug of the housing of the motor;
- f) Inspect the plug if water is present due to condensation;
- g) Inspect for corrosion;
- h) Check the rubber gasket;
- i) Check for abnormal sounds during operation. Conduct vibration check. Also check the temperature of the motors. Align the pumps if the vibration is abnormal.

4.2. The expected output of this maintenance is to ensure that all pumps of the whole MBR system are working properly as designed.

5. Blowers (6 units)

5.1. Blowers are necessary to ensure that the biomass in the Aeration Tank are provided with sufficient oxygen to maintain aerobic condition. Aside from this, this is also critical in providing air scouring in the membrane tank to ensure that the solids will not accumulate on the surface of the membranes. Furthermore, these are also used in ensuring that the influent is properly equalized/mixed in the

Equalization and Neutralization Tank and also to maintain aerobic condition in the WAS Tank. The maintenance steps for the blowers:

- a) Check the cable connections for deterioration;
- b) Check the pressure gauge. Adjust if necessary;
- c) Check the oil level;
- d) Change/replenish the oil if necessary;
- e) Check the intake filters;
- f) Clean the filters. Replace the filters annually or when necessary;
- g) Inspect for leakage especially when the blowers are in use for a long time;
- h) Inspect the housing of the motors;
- i) Unscrew the inspection plug of the housing of the motor;
- j) Inspect the plugs if water is present due to condensation;
- k) Inspect for corrosion;
- l) Check the rubber gaskets;
- m) Check for abnormal sounds. Conduct vibration check. Also check the temperature of the motors. Align the blowers if the vibration is abnormal.

5.2. The expected output of this maintenance is to ensure that all the blowers of the whole MBR system are working properly as designed.

6. pH Meter and Controller

6.1. The pH of the wastewater is critical in ensuring that the biomass in the Aeration Tank of the SMBR system will not die. Very low or very high pH value of the wastewater can washout the biomass and create an upset in the SMBR system. The maintenance and calibration procedure of the pH Meter and Controller:

- a) Calibrate the pH Meter using pH buffer solutions 4 and 7;
- b) Check for any defects or scaling on the surface of the sensor;
- c) If there are any defects, replace/repair as per instruction manual;
- d) Check the cables and pH controller functions;
- e) Check the acid and alkali metering pumps for leaks and abnormal sounds. Conduct repairs if necessary. Precaution in handling the metering pumps must be observed since strong acid and alkali can burn skin and clothing. Wear the necessary Personal Protective Equipment (PPE).

6.2. The expected output of this maintenance is to ensure that the pH Meter and Controller is working properly and are reading the correct pH values.

7. Permeate Flow Meter

7.1. The Permeate Flow Meter is used in setting the right flux rate for the operation of the MBR system. This is critical to ensure that the flux rate being used is within the range set by the manufacturer to prevent premature membrane damage. The maintenance procedure for the Permeate Flow Meter:

- a) Evaluate if the flow meter is showing correct values;
- b) Calibrate the flow meter as needed;
- c) Check for any defects.

7.2. The expected output of this maintenance is to ensure that the Permeate Flow Meter is working properly and is reading the correct flow rate for flux rate calculations.

8. Wastewater Feed Flow Meter

8.1. The Wastewater Feed Flow Meter is used in setting the right flow rate to ensure that the correct Hydraulic Retention Time (HRT) is achieved in the Aeration Tank. This is critical to ensure proper biological degradation of the wastewater. The maintenance procedure for the Wastewater Feed Flow Meter:

- a) Evaluate if the flow meter is functioning properly;
- b) Isolate the flow meter by activating the by-pass line. Remove the flow meter and inspect for any internal damage;
- c) Check for any defects;
- d) Clean the internal of the flow meter by using liquid detergent.

8.2. The expected output of this maintenance is to ensure that the Wastewater Feed Flow Meter is working properly and is reading the correct flow rate for proper biological degradation.

9. Transmembrane Pressure Transmitter

9.1. The Transmembrane Pressure Transmitter indicates the level of fouling on the membrane surface. Using this Transmembrane Pressure Transmitter, the operator will know when it is already time to do onsite cleaning of the Silicon Carbide Membranes. The maintenance procedure for this Transmembrane Pressure Transmitter is as follows:

- a) Evaluate the performance of the transmitter;
- b) Check the signal cables;
- c) Check for any defects.

9.2. The expected output of this maintenance is to ensure that the Transmembrane Pressure Transmitter is working properly and is reading the correct pressure to prolong the life of the membranes.

10. Basket Strainer

10.1. The Basket Strainer is used to remove particles more than 3 millimetres. This is to ensure that there will be no foreign objects that can enter the MBR system and ultimately damage the SiC membranes. The maintenance procedure for this Basket Strainer is as follows:

- a) Check for accumulated solids or clogging in the basket strainer;
- b) Thoroughly clean and remove the clogging;

10.2. The expected output of this maintenance is to ensure that the Basket Strainer is working properly to prevent large objects from getting into the Membrane Tank.

11. Pipelines

11.1. The maintenance procedure of the pipelines is as follows:

- a) Check for deterioration;
- b) Check for tightness;
- c) Check for leakage;
- d) Check exposed portions of the pipes. Repaint if necessary.

11.2. The expected output of this maintenance is to ensure that the pipelines have no leaks and are not rusted so that it will last for many years.

E. SILICON CARBIDE MEMBRANE INSPECTION AND RECOVERY CLEANING

Membrane inspection and recovery cleaning of the Silicon Carbide (SiC) membranes are necessary for the efficient operation of the membranes. It is recommended to conduct this membrane inspection and recovery cleaning every year for a trouble-free operation. The procedure of this membrane cleaning is as follows:

a. Preparation of the Chemical Cleaning Solution

- Organic fouling of the SiC membrane pores can be cleaned by using a dilute solution of bleach (sodium hypochlorite, NaOCl). Stock chemical solution should be diluted to 0.5~0.6%, and make approximately three (3) liters of the dilute cleaning solution per membrane cassette. However, if the sludge concentration is lower than 10,000 mg/L, dilute the chemical to 0.25%.
- Inorganic fouling (Iron, Aluminum, and/or others) of the SiC membrane pores can be cleaned by Oxalic Acid. Prepare about three (3) liters of 0.5 to 1.0% Oxalic Acid solution per membrane cassette. If the membrane cassettes are polluted with calcium (Ca), NEVER use Oxalic Acid. Hydrochloric Acid (less than 2%) or Citric Acid (less than 0.5~1.0%) should be utilized.

Note:

Type of chemical, concentration, contact time, and cleaning efficiency depends on wastewater characteristics and operating conditions in each plant.

b. Suspension of Filtration and Aeration

- Stop filtration and aeration of SMU to be chemically cleaned. Close the permeate valve(s).

c. Injection of the Chemical Solution

- Make sure that the water level in Membrane Tank is 300 mm or more above the top of Membrane Case, or the permeate tubes are completely submerged.
- Inject the prepared chemical solution into every Membrane Cartridge via the injection port (injection time takes approximately 5 to 10 minutes.) Pressurized chemical injection by pump should be avoided and injection by gravity (10 kPa or less and instantaneously 20 kPa or less) is recommended. In order to prevent pressure increase within Membrane Cartridges, the chemical should be injected by, for instance, adjusting the rate with valve. Moreover, the chemical should be injected intermittently in order to release the trapped air from Membrane Cartridges.
- When cleaning a calcium carbonate fouling (caused by treating Ca in the wastewater) by acid, a careful attention should be taken since the chemical reaction would generate carbonic acid gas and this may blow out from the injection port.

d. In-Site Chemical Cleaning

- After injection of the chemical solution, leave the Membrane Cartridges for one (1) to two (2) hours. As a guide, it should take approximately two (2) hours for cleaning organic substances and one (1) hour for cleaning inorganic substances.

e. Operation Re-Start

- Approximately fifteen (15) minutes after restarting filtration, return the permeate to the head of the plant (Equalization and Neutralization Tank).
- When cleaning with Sodium Hypochlorite, make sure the residual chlorine concentration in the permeate becomes low enough (10 mg/L or less) before resuming normal operation.
- After cleaning with acid, neutralize the Membrane Tank and wastewater. Confirm that pH in all the tanks are within proper range before restarting the operation.

Notes:

¹Because the chemical solution flows back slowly from the permeate side to activated sludge side by low pressure, it is more effective to clean the SiC membrane before it is fully fouled, or during the period when increase in filtration pressure is still small since the operation has just started.

²Never lift the Membranes without conducting filtration for at least thirty (30) minutes after the chemical cleaning. If SiC Membranes are removed as soon as chemical cleaning has finished, accidents due to trickle of the chemical and/or damage in Membrane Cartridges may occur.

CAUTION:

Before using chemicals, carefully read the Material Safety Data Sheet (MSDS), and wear protective equipment such as masks, goggles, gloves, etc. Misuse of any chemical may result in physical accident.

- 12.1 The expected output of this maintenance is to ensure that the membranes are maintained properly so that it will last for many years since it is the most expensive component of the MBR system.

F. BIOAUGMENTATION (SEEDING OF BACTERIA & ENZYME)

To maintain a healthy biomass in the Aeration Tank, bio augmentation since the wastewater coming from the building of BSWM contains wastes from its laboratory. Some wastes from laboratories might

be toxic to the activated sludge, hence, it is better to seed new bacteria and enzyme in the bioreactor to prevent biological upsets.

G. PARAMETERS TO BE ANALYZED

1. The following parameters shall be analyzed for the influent and effluent of the MBR system:
 - a. Biochemical Oxygen Demand (BOD)
 - b. Chemical Oxygen Demand (COD)
 - c. Total Suspended Solids (TSS)
 - d. pH (Range)
 - e. Oil & Grease
 - f. Color
 - g. Ammonia
 - h. Nitrate as $\text{NO}_3\text{-N}$
 - i. Phosphate
 - j. Chloride
 - k. Dissolved Oxygen (Minimum) – samples shall be taken from 9:00AM to 4:00PM
 - l. Fecal Coliform
 - m. Temperature – the natural background temperature as determined by Environment Management Bureau (EMB) shall prevail if the temperature is lower or higher than the WQG; provided that the maximum increase is only up to 10 percent and that it will not cause any risk to human health and the environment.

H. TECHNICAL STAFF REQUIREMENT

1. Supervisor One (1) pax
 - College degree in chemical or environmental engineering or any related technical course;
 - Has a minimum of five (5) years' experience in the installation, operation and maintenance of a MBR System; and
 - Has a minimum of ten (10) years of professional experience in wastewater treatment.
2. (SiC) Membrane Specialist One (1) pax
 - College degree in chemical or environmental engineering or any related technical course;
 - Has hands-on experience of at least three (3) years in the operation and maintenance of a MBR System using Silicone Carbide (SiC) Membrane; and
 - Has a minimum of five (5) years of professional experience in wastewater treatment.
3. Process Equipment Specialist One (1) pax
 - College degree in chemical or mechanical engineering or any related technical course;
 - Has a minimum of three (3) years' experience in the installation and maintenance of the process equipment installed in the MBR Wastewater Treatment System of BSWM; and
 - Has a minimum of five (5) years of professional experience in wastewater treatment.
4. SMBR Technicians Two (2) pax
 - Technical course graduate;
 - Has a minimum of three (3) years' experience in the operation and maintenance of MBR systems; and
 - Has a minimum of five (5) years of professional experience in wastewater treatment.
5. Safety Officer One (1) pax
 - Graduate of any four (4) or five (5) year course;

- Has completed either the Basic Occupational Safety and Health (BOSH) or Construction Occupational Safety and Health (COSH) training; and
- Has a minimum of three (3) years' experience in the operation and maintenance of MBR systems.

NOTE: Please submit all evidence to support the qualifications of the Technical Personnel

I. REQUIRED EXPERIENCE

The SERVICE PROVIDER shall have three (3) years of experience in handling maintenance of **STP-SMBR system with Silicon Carbide Submerged Flat-Sheet Ultrafiltration Membrane.**

J. ESTIMATED COST FOR THE FISCAL YEAR 2024

The total estimated cost for the Maintenance Program for 2024 is **Two Million Five Hundred Thousand Pesos (Php 2,500,000.00).** This cost is inclusive of the following supply and works:

1. Perform all the works mentioned above.
2. Supply all the necessary chemicals, consumables, manpower (technical staff and laborer) for the performance of the maintenance activities.
3. Conduct at least four water sampling and analysis of the influent and effluent of the MBR system (1st sampling – before start of maintenance program, 2nd-4th sampling every 30 days within the contract period. Additional sampling might be needed until final result is compliant to wastewater standard.).
4. Submit result of analysis of the influent and effluent of the MBR system.
5. Submit written periodic report (30th and 60th day or after every sampling) and final detailed and full report (90th day or after completion of maintenance) with recommendations regarding the status of operation of the MBR system.
6. Training for the authorized BSWM personnel.

K. BREAKDOWN OF COST

The total estimated cost for the Maintenance Program for 2024 of **Two Million Five Hundred Thousand Pesos (Php 2,500,000.00)** is broken down as follows:

| | |
|---|-----------------------|
| 1. Maintenance of all components | |
| (labor, materials and equipment) | Php 635,800.00 |
| a. Material cost (paints, grease, detergents, oil, etc) | Php 80,000.00 |
| b. Labor (mechanic @ PhP 600/day, lubeman @ PhP 500/day and 10 laborers @ PhP500/day for 78 working days) | PhP 475,800.00 |
| c. Equipment (vibration monitoring equipment, thermal gun, etc) | PhP 80,000.00 |
| 2. Membrane (SiC) inspection and recovery cleaning | Php 160,000.00 |
| a. Material Cost (Buffer solutions, Citric Acid, Sodium hypochlorite solution) | PhP 160,000.00 |
| 3. Bioaugmentation (seeding of bacteria & enzyme) | Php 408,000.00 |
| a. Activated Sludge Booster | PhP 382,000.00 |
| b. Labor (2 seeders for 26 days @ PhP500/day) | PhP 26,000.00 |
| 4. Wastewater sampling and analysis | Php 288,000.00 |
| a. Water analysis (Monthly Sampling) | PhP 280,000.00 |
| b. Labor (2 samplers per sampling @ PhP1,000/sampling) | PhP 8,000.00 |
| 5. Technical Staff Requirement (90 days or 3 months) | Php 450,000.00 |
| a. 1 Supervisor (PhP 40,000/month) | PhP 120,000.00 |
| b. 1 (SiC) Membrane Specialist (PhP 25,000/month) | PhP 75,000.00 |
| c. 1 Process Equipment Specialist (PhP 25,000/month) | PhP 75,000.00 |
| d. 2 MBR Technicians (PhP 20,000/pax/month) | PhP 120,000.00 |
| e. 1 Safety Officer (PhP 20,000/month) | PhP 60,000.00 |
| 6. OCM plus Margin of Profit (15%) | PhP 290,970.00 |

7. Value Added Tax (12%)

PHP 267,230.00

K. EXCLUSIONS

The service provider shall not be held responsible under the contract for items, components, or services delivery as stipulated below:

1. Supply of spare parts, tools, or materials for equipment correction/repair service;
2. Upgrade or improvements on the hardware;
3. Any mechanical or electrical breakdown involving components that has been added, substituted, or modified without prior notice to the supplier;
4. Any failure due to fire, lightning, explosion, storm, collision, vandalism, water damage, earthquake, flood, radiation, or contamination; and losses caused by intentional actions, negligence, intentional overloading, improper testing, or the imposition of abnormal conditions;