City of San Luis
West Wastewater Treatment Plant Phase 1 MBR Upgrades

Request for Proposals
Membrane Bio-Reactor System

Date: November 10th, 2024
Proposals Due: December 9th, 2024

All interested equipment suppliers (referred to as manufacturers, vendors, or suppliers) shall provide a design and price proposal to be received no later than **4:00 PM (Mountain Standard Time) December 9th, 2024** for a complete Membrane Bio-Reactor (MBR) Package System in conformance with the following performance specification, emailed in **PDF format** to ntesch@pacewater.com or alternatively, a hard copy can be submitted to Pacific Advanced Civil Engineering, Inc. (PACE), Attention: Nathaniel Tesch, EIT, 8723 E. Via de Commercio, Ste. A-204, Scottsdale, AZ 85258. The submittals will be privately opened. No pre-proposal will be held.

Bidding Documents can be downloaded at www.questcdn.com under an individual login for a non-refundable charge of $22.00. Quest CDN Project number is 9395163. Registration with Quest CDN is required to be on plan holders list and receive project communications. Please contact QuestCDN.com at (952) 233-1632 or info@questcdn.com for assistance in free membership registration, downloading, and working with this digital project information. Any questions about obtaining documents can be forwarded to Andrea Jaycox at ajaycox@pacewater.com or (602) 502-9683.

This request for proposal is for a complete MBR Package System, which will be integrated into the City of San Luis West WWTP's Phase 1 MBR Upgrade plans. The MBR system will be capable of treating the maximum month average day flow (MMADF) of 3.0 million gallons per day (MGD). The MBR system will include an activated sludge Biological Nutrient Removal (BNR) process that utilizes microfiltration membranes, either flat plate or hollow fiber, to filter out the treated effluent. The treated effluent must meet Arizona Title 18 BADCT and Class A+ Effluent Reuse Standards. The MBR system will be supplied with all the required equipment necessary for the biological and MBR filtration process, including all process equipment, associated mechanical appurtenances, electrical systems, instrumentation, and a PLC-based control system for automated control of MBR Process within the system. The MBR control system will communicate via Ethernet to a new WWTP master control panel and SCADA system.

One equipment vendor will be pre-selected and will form the basis of the full-scale design that will be incorporated into the WWTP's Phase 1 MBR Upgrade plans. The modification design plans are scheduled to be completed before the Summer of 2025 and construction is anticipated to begin soon after. As the City is pursuing a CMAR approach for the project, equipment procurement will begin soon after a manufacturer is selected and prior to completion of the final design plans.

Equipment Manufacturers/Vendors have the option to provide multiple proposals for all equipment that can satisfy this performance specification RFP. Equipment manufacturers/vendors are encouraged to identify significant benefits their proposal provides, which are above and beyond the minimum

requirements of this specification RFP. Proposal offerings will be evaluated based on the following criteria. See PROPOSAL REVIEW & GRADING section for the weighting and definition of criteria.

- Project Approach
- Capital Cost
- Operating Cost (Chemical and Energy Cost)
- Performance
- Ease of Operation
- Full Maintenance and Repair Contract
- Installation Requirements and Layout
- Reference List
- Fabrication
- Delivery Schedule
- Service
- Completeness of Supply
- Completeness of Proposal
- Performance Bond

PROJECT INFORMATION

The City of San Luis (San Luis) owns and operates two (2) wastewater treatment plants (WWTP) for treatment of municipal wastewater generated within its city limits. The West WWTP was built in 1982 and was last upgraded in 2002 to handle an average daily flow of 1.5 MGD. The East WWTP was built in 2006 and was designed to handle an average daily flow of 1.0 MGD. Wastewater from the City is collected and transported to both treatment plants through a network of lift stations. The flow is generally split by geographic location with flow conveyed to the nearest treatment plant. The one exception is the Juan Sanchez Lift Station. This lift station pumps 300,000 – 600,000 gallons per day (gpd) from the west side of San Luis into the East Mesa Lift Station, which is then conveyed to the East WWTP.

Based on the recent process evaluation, both the East and West WWTP have adequate treatment capacity to meet the immediate wastewater treatment needs of San Luis. The maximum month average day wastewater flow generated by the City is approximately 1.6 – 1.7 MGD. Approximately 1.3 – 1.5 MGD are generated from the western portion of the City and approximately 0.3 – 0.4 MGD is generated from the eastern portion of the City. Currently, approximately 0.3 -0.6 MGD is pumped from the western portion of the City to the eastern portion of the City by the Juan Sanchez Lift Station to alleviate flow to the West WWTP. Without the diversion pumping, the West WWTP would exceed 80% of its design capacity (or 1.2 MGD) and expansions of the West WWTP would be immediately required per its Aquifer Protection Permit (APP). With operation of the Juan Sanchez Lift Station, the City can split the flow as needed between the WWTPs but at an increased power cost. The East WWTP has sufficient capacity to treat the flow within its natural sewer watershed (or sewershed) and additional capacity to handle flow from the west portion of the City for the time being.

As a result, the West WWTP will be upgraded to provide additional treatment capacity. In addition, due to the deteriorating conditions of equipment and piping, as well as concern over the structural integrity of the digester walls, the facility is coming to the end of its useful life as originally designed. Timing is a critical component in the planning for expansion. It is recommended that improvements to the West WWTP be completed while a portion of the flow can still be diverted to the East WWTP. By diverting

flow to the East WWTP, 1/3 of the process at the West WWTP can be taken down without affecting treatment performance. This will be beneficial as it will increase the ease of construction and help to mitigate costly construction contingencies, such as temporary storage, treatment, and bypass pumping.

The City performed an evaluation that recommended upgrading the West WWTP to a treatment capacity of 3 MGD by converting the existing SBR process to an MBR process (PACE, 2022). The upgrades, which are currently in design, will consist of improvements to the headworks, the construction of a new flow equalization basin, modifications to the biological process of the treatment plant, addition of mechanical sludge dewatering, and the installation of a new MBR system. The upgrades will also include provisions to expand the West WWTP to 4.5 MGD and 6 MGD future build-out capacity through 2 consecutive phases.

This RFP is for the MBR Process Equipment needed to increase the treatment capacity to 3 MGD and shall form the basis of design for the conversion of the SBR process to the MBR process.

Provided Exhibits

- Exhibit A – Reference List
- Exhibit B – Performance Bond
- Exhibit C – Equipment Lump Sum and Design Worksheet
- Exhibit D – Exclusions and Exceptions Form
- Exhibit E – Addendum Acknowledgement Form

Appendices

- Appendix A – Updated and Proposed Diagrams
    - Existing Site Layout (PDF and CAD)
    - Existing SBR Basin Layout (PDF and CAD)
    - Conceptual MBR Layout (PDF and CAD)

- Appendix B – Supplemental Information and As-Builts
    - Tech Memo – City of San Luis West WWTP Expansion Options (PACE, 2022)
    - City of San Luis West WWTP – 1992 Plan Set
    - City of San Luis West WWTP – 2002 Plan Set

PROPOSAL REQUIREMENTS

Proposal submissions should include all the information requested within the RFP. Proposals must be complete, including - but not limited to - the following items below. Submittals shall be formatted in a manner that allows quick referencing for pertinent information. All requested information is to be provided so that no inferences will be required by the engineer. PDF files shall be provided with digital tabs or bookmarks for quick navigation within the Submittal Package. Each item below shall have its own individual section in the proposal. The offering shall include, at a minimum, the following sections with the required information.

1. **General Information**
    a. Company information and bio.

2. **Project Understanding and Approach**

The proposal shall include a Project Understanding and a detailed Project Approach on conversion of the existing SBR process to the MBR process. The Project Approach shall include, at a minimum:

a. A brief discussion of the project understanding
b. Description and layout of the proposed SBR to MBR conversion
c. Process Flow and Hydraulic Profile of proposed MBR process
d. List of major equipment proposed and/ or required for the new MBR Process
e. Detailed design calculation for proposed MBR process and equipment systems, showing compliance with the proposed application.
f. Biological Process Report with summary of modeling results.
g. Preliminary Process and instrumentation Diagrams (P&IDs) for all process inputs and outputs
h. *Provide a proposed MBR Process Layout, which should include at a minimum:*
    i. Overall system layout
        a. Identify dimensions, including clearance/service space requirements.
        b. Identify any proposed structural modifications or additions
        c. Identify the locations or placements of Vendor-supplied equipment
        d. Identify major mechanical improvements, such as weir gates, piping schematic, valves, etc., required for the process and whether those mechanical improvements are included within the vendor's scope.
    ii. Provide sectional views to clearly depict equipment installation and locations within the structure.
    iii. Appendix A includes PDF drawings for the existing process structure for vendor use (AutoCAD documents are provided under separate zip files).

3. Scope of Supply and Cost Proposal

a. Vendor shall complete Exhibit C - Equipment Lump Sum and Design Worksheet (PDF and Excel Format) for Vendor-supplied equipment and scope for the MBR Process.
    i. Total lump sum costs shall include:
        1. Equipment capital cost
        2. Installation inspection and certification – Vendor shall be responsible for the inspection and certification of all equipment that is part of the MBR WRF Scope of Supply
        3. Total freight (F.O.B. Jobsite)
        4. Total spare parts cost. Price list of standard spare parts and system consumables, including availability of spare parts.
        5. Total performance bond cost. *(See Exhibit B)*
        6. Warranty and Warranty Extension cost (See Definition Section)
        7. Total inspection, start-up, commissioning, and training costs – include 3 trips.
            a. The first trip is for installation inspection (1 full day (8 hrs/day))
            b. The 2nd trip is for startup, commissioning, clean water testing, and training (minimum of 5 full days (8 hrs/ day)).

c. The 3rd trip will be for a 10-month follow-up inspection/training visit for all supplied equipment/systems.
d. Site visits/trips shall be coordinated with the City a minimum of 10 calendar days prior to trip.

8. Total clean water testing cost (See Definition Section)
9. Seeding Assistance cost (See Definition Section)
10. Total Demonstration Period cost. (See Definition Section)
11. Total cost to provide offering for Full Maintenance and Repair Contract that covers a period of 5 years with the option to extend for an additional 5-year period. See Definition section for more details.
12. Pricing shall be guaranteed based on item 3a(i) – fixed price proposal shall be guaranteed for 6-months after a notice of selection has been issued by the City. At the end of the 6-month holding period, the selected vendor agrees the inflation rate shall not exceed more than a 1% increase per quarter for 1-year, or to the inflation rate stated by the Phoenix Tender Price Index determined by Rider Levett Bucknall, whichever of the two is lower. The City reserves the right to cancel its dealing with the selected Vendor at any time prior to issuing a notice to proceed.
13. The City is pursuing additional grant funding for this project. As certain grants require Buy America, Build America (BABA) compliance, the Vendor must provide an additional line item with total cost associated with providing a BABA compliant system.
    a. The Vendor will provide a list identifying equipment in which a BABA waiver/exemption can be granted.

b. Supporting Documentation
    i. Manufacturer's Standard Equipment Warranty terms (2-year minimum)
    ii. MBR Process and Equipment Standard Operating Procedures. The vendor will provide a generic Operation and Maintenance (O&M) Manual detailing the normal operating and maintenance requirements for the MBR System's membrane equipment (detail description of permeate extraction, relax, clean-in-place (CIP), mechanical cleaning, etc.).
    iii. For major equipment and instrumentation, provide detailed design calculations or equipment cutsheets/ data sheet showing compliance with the proposed application (see also MBR Vendor Scope of Supply Section)
    iv. Equipment drawings showing the following for all major equipment:
        1. Plan view and two section views of equipment
        2. Overall system dimensions with clearance/service space requirements
        3. Locations and sizes for all process connections
        4. Locations for control panel and/or electrical power and instrumentation connections
c. <u>Specifications</u>: For major equipment, provide Technical Specifications in CSI (50 Division MasterFormat) and shall include, at a minimum:

i. Provide technical specifications for all major MBR components.
   1. MBR membranes and appurtenances
   2. Pumps and mixers
   3. Blowers
   4. Fine Bubble Aeration
   5. Chemical Injection and storage
   6. Instrumentation (DO, Level, ORP, Turbidity meter, etc)
   7. Controls

ii. Specifications can be individual or combined.

iii. Specifications shall include, at a minimum:
   1. Part 1- Description of general product, functionality, and warranty
   2. Part 2 – Product Specifications and Performance Information
   3. Part 3 – Execution for the installation of the equipment

d. Guarantee Statement: All Vendors are required to submit a guarantee letter signed by an officer of the bidder's company indicating compliance with the specifications. The guarantee statement shall indicate that the proposed MBR system will conform to AZ Title 18, Class A+ requirements for Unrestricted Reuse. It shall also state that all required MBR subsystems required for a fully operational system, as outlined in the following specifications, have been included in the firm equipment proposal. Further, it shall state that required subsystems or appurtenances omitted will be provided by the Vendor at no additional cost to the owner.

e. Maintenance Requirements and Schedule: Schedules shall include an itemized list of tasks that need to be done on a daily, weekly, monthly, or yearly basis to ensure proper operation of the proposed equipment. Maintenance requirements and schedule should parallel list of spare parts (and system consumables) that will need to be checked, and/or replaced as part of the normal maintenance for each equipment item.

f. Operating Cost: Operating cost calculation shall be provided based on power and chemical usage at the 3.0 MGD design flow.
   i. List Power requirements (in Kw) at point of connection and full-load amp (FLA) requirements for all equipment items.
   ii. Provide a preliminary single-line diagram with all major electrical equipment
   iii. List operating hrs for each equipment
   iv. List the process for chemical use, the type of chemicals, the frequency of use, the quantity, and the estimated unit cost of the chemicals.

4. Fabrication and Delivery Schedule

a. Provide schedule to include the following:
   i. Time required to generate an acceptable submittal for the Engineer's review.
   ii. Time required to manufacture the equipment once the submittal has been approved by the Engineer.
   iii. Time of Delivery for O&M Manuals.
   iv. Time of delivery of complete equipment systems.
   v. Statement indicating schedule delay (for both shop drawing submittals preparation and equipment fabrication) will result in liquidated damage of $500 per calendar day with cap at 50% of the equipment cost.

5. **Exclusions/Exceptions Form**
    a. Provide an Exclusions/Exceptions Form (Exhibit D) identifying exclusions or exceptions to any of the RFP requirements. If none, please include with proposal package and indicate "None".
    b. Include a list of equipment that is not included with the Vendor's offering but is needed for the proper operation of MBR process. if none, please indicate none.
6. **Reference List Form**
    a. Provide detailed description of a minimum of three referenced projects on Reference List form (Exhibit A).
7. **Addendum Acknowledgement Form**
    a. Provide an Addendum Acknowledgement Form (Exhibit E) to be signed by a representative of the vendor's company acknowledging each addendum has been received. If none, please include with the proposal package and indicate "none".

PROPOSAL REVIEW & GRADING

In order to select the best MBR treatment system for the application, the following methodology will be used. Each criterion will be assigned a weight; the higher the weight, the more important the aspect is to the project. Then, each equipment solution proposed will be rated on a scale, with the highest score indicating most competitive or best. For each criterion, the score and the weight will be multiplied together. The scores will then be added together for each solution to arrive at the total score. The equipment with the highest score will be the recommended selection. Omission of information for any of the listed criteria categories will result in a score of zero (0) for that criteria category. Equipment not meeting the minimum requirements as stated in the General Design Requirement section will not be considered.

Table 1: Proposal Grading Criteria

Criteria	Weight	Vendor 1	Vendor 2	Vendor 3	Vendor 4	Vendor 5
		Scoring Scale				
Project Approach	*10*					
Capital Cost	*10*					
Operating Cost	*8*					
Performance	*10*					
Ease of Operation	*9*					
Full Maintenance & Repair Contract	*7*					
Reference List	*10*					
Quality of Supply/ Fabrication	*8*					
Delivery Schedule	*4*					
Service	*4*					
Installation Requirement & Layout	*8*					
Completeness of Supply	*7*					
Completeness of RFP	*y/n*					
Performance Bond	*y/n*					
Total Score						

Criterion Definitions and Requirements

Project Approach: See **Proposal Requirement Section** above

Capital Cost: The cost to provide the complete operational system F.O.B. to jobsite as itemized in the Equipment Lump Sum Worksheet (See **Scope of Supply and Cost Proposal Section**). Lowest capital cost will be ranked the highest. Capital costs within 5% of each other will be ranked the same.

Operating Cost: This is an evaluation of annual operating costs based on energy and chemical usage (See Operating Cost under **Scope of Supply and Cost Proposal Section)**. Costs within 10% of each other will be ranked the same.

Performance: Quality of effluent, loading rates, flux rate, etc. that meets the performance requirements identified in the General Design Requirements. Must agree to provide a performance guarantee; otherwise, the proposal will be considered non-responsive.

Ease of Operation: Complexity of process, automation, equipment hours of operation, man-hour requirements, scheduled maintenance, maintenance requirements, and reliability. The expected maintenance schedule shall be provided by the vendor. Schedules shall include an itemized list of tasks that need to be done on a daily, weekly, monthly, or yearly basis to ensure proper operation of the proposed equipment, along with the time required to perform each task. Operational procedure as identified in the O&M Manual.

Full Service Contract: Ranking based on the cost and terms of the contract offering. The Contract shall cover a period of the first 5-years with City's option to extend for one (1) additional 5-year period. The cost of the future 5-yr option will be based on present day cost and shall be tied to an inflation rate of no more than 1% increase per quarter or to the inflation rate stated by the Phoenix Tender Price Index determined by Rider Levett Bucknall, whichever of the two is lower. The Contract shall require the Vendor to perform the following:

- Conduct all Vendor's equipment-related maintenance and instrument calibrations at the intervals specified by the manufacturer. The Vendor shall provide a comprehensive list of all equipment and instruments denoting the frequency of service per the manufacturer.
- Conduct all Vendor's equipment repairs, including parts, labor, travel and other miscellaneous costs.
- Support all equipment-related service alarms.
- Daily remote operation of the site. This includes remote monitoring of the WRF through SCADA, daily communication and collaboration with the City's maintenance staff on the operation of the WRF, training the City's staff for daily onsite activities, reviewing operational and lab data, adjusting facility's operational parameters as needed, attending to alarms and malfunctions.
    - The City's maintenance personnel shall assist Vendor with the following:
        - Process sampling for operation and regulatory requirements
        - Resupply chemical or fuel
        - Shipment and delivery
        - Laboratory shipment and handling
        - Perform minor maintenance (requiring less than 30 minutes of labor). Vendor to

provide a detailed list of the minor maintenance tasks.
    - The City's personnel does not do repairs or service calls.
- Annual Performance Reports highlighting concerns and recommendations for improvement.
- The service contract shall include the cost of consumables (oil, oil filters, air filters, lubricants, belts, filters, coalescing filters, etc.)
- The spare parts provided to the City may be used to correct issues but shall be restocked within thirty (30) calendar days.
- 24/7 continuous telephone and PLC code support
- Visiting the facility once per year (minimum of two (2) days on-site during each visit). Visits shall include observation of operations, assessment of MBR System Equipment, and supplemental training of personnel. The Vendor representative shall be an engineer or startup technician; the routine maintenance technician is not acceptable.
- Spare parts inventory review and management.
- Payments for the service contract will be made annually.
- Provide a guaranteed onsite response time – the guaranteed time period in which a technician will arrive onsite once it is determined that they are needed. The Contract shall include language stating that if the technician is not onsite within the guaranteed onsite response time period, the Vendor will pay liquidated damages of $500 for each day of delay.
- The City reserves the right to cancel or not renew the service contract at any time.

Installation Requirements and Layout: Refers to the mechanical and structural layout and installation of the Vendor's process and equipment. Higher scores are awarded to systems with minimal modifications to the existing structural tanks and minimal installation complexity. Preference shall also be given to the use of skid-mounted or factory plumbed systems.

Reference List: List of similar equipment installations for complete package MBR WWTP systems within the range of 1-5 MGD, including process type; treatment capacity; effluent quality, etc. Reference information shall be provided per Exhibit A. Each vendor shall provide an installation list with contact information for a minimum of 3 systems in operation in the United States of America. Each successful reference shall be asked to rank their overall experiences from 1 – 10 (10 being highest). Scores will be based on average ranking from the responsive references. At minimum, 3 references will be scored. If there are less than 3 responsive references, non-responses will be given a ranking of 1. For example, if only 2 references responded, then a score of 1 will be given to the missing third reference. The average of the three scores will be used in the evaluation. The City reserves the right to contact additional references. If additional references are contacted by the City, those references will be averaged into the score.

Reference installations within the State of Arizona are preferred in order to provide the City/WWTP Operators with ease in coordinating site visits and corresponding with other relatively local cities and WWTP operators regarding equipment performance, service, etc.

Bids from manufacturers lacking the US installation requirements, but meeting all technical and performance requirements of these specifications, may be considered by the City if the manufacturer provides a satisfactory seven (7) year performance bond in lieu of evidence of experience and operation.

The performance bond shall be for 100 percent of the replacement value of the equipment. The bonding company shall have a policy-holder rating of A+ and a financial rating of "Class XV" in the most recent edition of "Best Key Rating Guide". The bonding company shall be licensed to do business in the State of Arizona. The cost of such bonding shall be included in the Base Bid price at the time of proposal.

Fabrication: Proposals will be reviewed and graded to determine the quality of materials used in the fabrication of the MBR system and associated major equipment (as provided in Vendor's CSI specifications). The City, at their discretion, may request site visits of existing installations to view completed and operational systems, which are representative of the quality the manufacturer is proposing. The manufacturer shall assist in coordinating requested site visits for the City.

Delivery Schedule: Proposal shall be reviewed and graded on the delivery schedules. The shorter the schedule, the higher the grading. Timeframes within one week are scored the same. See also **Fabrication and Delivery Schedule Section** of the proposal requirements.

Service: Location of nearest service center, availability of spare parts; quality of service provided. Each vendor shall list the nearest service and support center to the project location. Distance from the project site shall be included along with the services provided by the location. Vendors with relatively "local", and/or expeditious Service Supply and Part Centers, fully stocked with equipment, consumables, and spare part inventory will be scored higher under this Criterion.

Completion of Supply: The completeness of the proposal to include all the necessary equipment and ancillaries that will be required to meet the performance requirements as stated herein. Proposal lacking or missing major components will be scored lower. Proposals, at the determination of the City, not conforming to the requirements of these specifications may be eliminated from further consideration.

Completion of Proposal: The completeness of the proposal to include all the necessary RFP components and required support documentation. Proposals, at the determination of the City, not conforming to the requirements of the RFP may be eliminated from further consideration. The City reserves the right to reject any and all proposals.

Performance Bond: Willingness to agree to terms of the Performance Bond (*Exhibit B)* and to provide a performance guarantee for a minimum of 2 years on the equipment, with the ability to extend the Bond to match the lifetime of the extended Warranty (if chosen). The costs associated with extended the Performance Bond will be provided as a separate line item. Proposals not accepting the terms of the bond will not be considered. The Performance Bond shall be for 100 percent of the replacement value of the equipment. The bonding company shall have a policy-holder rating of A+ and a financial rating of "Class XV" in the most recent edition of "Best Key Rating Guide". The bonding company shall be licensed to do business in the State of Arizona.

Additional Proposal Definitions and Terms

Maximum Month Average Day Flow (MMADF): The flow rate representing the average daily flow of the month with the highest average daily flow.

Maximum Day Flow (MDF): The flow rate representing the flow from highest flow day in the maximum month. Calculated as 1.3 x MMADF.

Peak-hour Flow (PHF): The flow rate representing the highest flow in one hour. Calculated as 2.5 x MMADF.

Power Requirements: Guaranteed kW-hr of electricity consumed at final point of connection to proposed equipment; FLA draw.

Clean Water Testing: Following successful Vendor's installation certification, the Vendor and the San Luis General Contractor shall perform Clean Water Testing. Vendor and General Contractor shall develop a Clean Water Testing Protocol for both the City and the Engineer's approval prior to Clean Water Testing. The Clean Water Testing shall cover the following:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the respective equipment and components comprising the facility using clean water as evidence of Substantial Completion.
- Duration of Testing Period: 48 consecutive hours.
- Time of beginning and ending the clean water testing shall be agreed upon by General Contractor, Vendor, and the City in advance of initiating the Clean Water Testing Period.
- If, during the Clean Water Test, any equipment or system fails or is inoperative, the demonstration of functional integrity will be deemed to have failed. In the event of failure, a new Clean Water Test will recommence after correction of the cause of failure. The new Clean Water Test Period shall have the same requirements and duration as the previously conducted and shall be at no cost to the City.
- The City will provide operational personnel to provide process decisions and input affecting plant performance. The City's assistance will be available only for process decisions. General Contractor and Vendor will perform all other functions including but not limited to equipment operation and maintenance until successful completion of the Clean Water Testing.
- All operational variables, including alarms, shall be tested. Equipment failure simulation shall be performed to verify the functional integrity of automatic and manual backup systems and alternate operating modes.
- Upon successful completion of the Clean Water Test, the Engineer will endorse a certificate attesting to the successful demonstration and citing the hour and date of the successful completion of the Clean Water Test as the effective date of Substantial Completion of the WWTP construction component of the project.
- Water for Clean Water Testing shall be provided by the City.

Seeding: At the completion of the Clean Water Test, the City shall commence seeding of the WRF. The Vendor shall work with the Engineer and City to develop a seeding protocol identifying the step-by-step procedures, the additional required equipment (if any), quantity of seed, and the effluent testing procedures.

Demonstration Period: Once seeding is completed, the City and vendor shall commence the Demonstration Period. The Demonstration Period shall:

- Demonstrate the functional integrity and performance of the WRF as evidence of meeting the Performance Guarantee.

- Duration of Testing Period: minimum of 2 weeks
- Time of beginning and ending the clean water testing shall be agreed upon by General Contractor, the City, and Engineer in advance of initiating Demonstration Period.
- Vendor will oversee the demonstration period while the City will provide the operational staff for onsite labor, testing, and maintenance to operate the system. The Vendor shall monitor the system (onsite or remotely) during the demonstration period and direct the operation staff to ensure the performance requirements.
- If, during the Demonstration Period, any major failure or inoperative and/or effluent quality exceedance, the demonstration will be deemed to have failed. In the event of failure, a new Demonstration Period will recommence after the Vendor has made the correction that caused the failure or exceedance. The new Demonstration Period will require that the Vendor's representative be onsite for the duration of the new test, and the new test shall have the same requirements and duration as the previously conducted test and shall be at no cost to the City.
- The City will provide any and all chemicals necessary for operation.
- Upon successful completion of the Demonstration Period, the Engineer will endorse a certificate attesting to the successful demonstration and the Final Completion of the project, citing the hour and date of the successful Demonstration Period of meeting the performance requirement of the project.

Equipment Warranty and Warranty Services:

A minimum 2-year Manufacturer's Standard Warranty shall be provided. Manufacturers/Vendors shall provide the cost to extend the warranty for an additional 1-year and list the cost as an add alternate in a separate line item in the proposal. If additional Extended Warranty Options (durations) are available, the Manufacturers/Vendors shall include this information in the price proposal, along with the costs associated with the respective options (as a separate line item). The warranty shall include meeting the performance guarantee specified. Vendor shall bear 100% of any replacement costs or costs incurred due to upgrades required to meet the performance requirements during the lifetime of the warranty period and/or the duration of the Full Maintenance and Repair Contract. NOTE: Warranty period to commence following start-up and acceptance of the equipment.

During the Warranty Period, the MBR Vendor's warranty services shall also include:

- Remote monitoring of the membrane performance and annual performance reports highlighting concerns and suggestions for improvement.
- Visiting the City of San Luis MBR WWTP annually (minimum of two (2) days on-site during each visit). Visits shall include observation of operations, assessment of MBR System equipment, and supplemental training of personnel.
- 24/7 continuous telephone and PLC code support for supplied equipment

PROJECT DESIGN REQUIREMENT

The MBR System shall meet the treatment capacity and effluent requirements listed in Table 2, below.

Table 2: San Luis West WWTP MBR Phase I Design Parameters and Requirements

Parameter	Value
Project Location	San Luis West WWTP, San Luis, Arizona
Phase 1 MBR WRF Treatment Capacity (Max Month Ave Daily Flow)	3.0 MGD
Wastewater Type	Domestic
Treatment Process	6mm Fine and 2mm headworks screening and grit removal, flow EQ, anoxic, oxic, and biological nutrient removal activated sludge with MBR secondary treatment process, chlorine disinfection.
Ambient Temperature Range	35°F to 120°F
Site Elevation	Approximately 100 ft
Winter Water Temperature	65 deg F
Influent Flows	
Maximum Month Average Daily Flow for Phase I	3.0 MGD
Maximum Month Average Daily Flow at Future Phase 2	4.5 MGD
Maximum Month Average Daily Flow at Future Phase 3 (Buildout)	6.0 MGD
Maximum Day Flow Factor	1.3 x MMADF
Peak-hr Flow Factor	2.5 x MMADF
Influent Loads at Max Day Flow	
BOD	360 mg/L / 9,007 lbs/ day
TSS	300 mg/L [7,506 lbs/day]
TKN	80 mg/L [2,002 lbs, day]
FOG	42 mg/L
CaCO3	600 mg/L
Performance Guarantee - Effluent Requirements	
BOD_5 (mg/L)	< 10 (monthly average)[2]
TSS (mg/L)	< 10 (monthly average)[2]
TN (mg/L)	<10
Turbidity (NTU)	< 2 (daily average) < 5 (max daily)
Fecal Coliform	Non-Detect (<1 CFU) for 4 of 7 daily samples, single sample maximum not to exceed 23 CFU

[1] Maximum Month Average Daily Flow (MMADF) is the daily influent flow rate that occurs in the month with the highest average daily flow.
[2] Not a requirement of the permit but assume value in order to meet the effluent TN, Turbidity, and Fecal Coliform requirements.

MBR VENDOR SCOPE OF SUPPLY

The MBR System Vendor must be the membrane manufacturer and will be the sole system supplier. The MBR System Vendor shall furnish and commission the MBR System to meet the performance requirements for the City of San Luis 3 MGD Phase 1 MBR Upgrade as described in this RFP, inclusive of all equipment, instrumentation, scope-specific piping systems, controls, integration, and warranty support. The MBR System Vendor shall provide engineering and design services in support of the treatment system design in accordance with best practices and industry standards, and as described in this RFP.

The MBR System Vendor shall review the complete MBR system requirements and develop an MBR System to include:

- Secondary Process Design and equipment
  - Fine bubble aeration system
  - Process Blowers
  - RAS/WAS Process
  - Mixers and Pumps
  - Instrumentation and Controls
- MBR system design and equipment
  - Membranes
  - Pumps
  - Aeration and Blowers
  - Instrumentation and Controls
- Process Control Panels and HMIs

MBR PRODUCT ENGINEERING AND DESIGN SERVICES:

The MBR System Vendor will provide the following design services related to the MBR Process:

1. Biological Process Design Verification – The MBR Vendor shall provide analysis and verification of the Vendor's proposed biological process design, based on the influent mass loading, diurnal flow curves, peak flow/loading numbers, and permit limits. The Vendor shall verify basin volumes, recycle rates, aeration requirements, chemical dosing requirements, and solid waste projections. The supplier shall provide a written report summarizing the design results.
2. Piping and Flow Hydraulic Analysis and Design – The MBR Vendor shall provide a detailed hydraulic analysis and mechanical design documentation of each process subsystem contained in the MBR system Scope of Supply. Subsystem piping designs shall be analyzed to verify flow distribution between membrane units, pump duty points and turn down, and flow control valve Cy and rangeability. The Vendor shall supply piping design of each system

and shall be provided to the Engineer for verification and review. The subsystems included in the hydraulic analysis shall include:

a. Recycle (RAS) pump systems
b. MBR air distribution systems (Process & Scour)
c. Permeate systems
d. WAS systems

3. Equipment Sizing and Installation Details – The MBR Supplier shall verify duty points and turn-down, supply voltages, materials of construction, communications IO, equipment access and serviceability, area classifications, and pressure ratings for the MBR system's pumps, blowers, mixers, and valves. In addition to identifying manufacturers and specific part numbers for each component, installation details and CAD drawings shall be provided for integration into the Engineer's design package.
4. Instrumentation Design – The MBR Supplier shall provide the Engineer with complete specification and documentation of all MBR system instrumentation. Each instrument's manufacturer, model, size, range, power, communications protocol, units, materials, connections, and area classification shall be documented in CSI specification forms. Installation details shall be provided in AutoCAD format for integration into the Engineer's design package.
5. Controls Design – The MBR Supplier shall supply MBR system Process and Instrumentation Diagrams utilizing the Supplier's standard symbols and tagging schemes, MBR system control panel layout/fabrication details, and MBR system control panel wiring schematics in AutoCAD for integration into the Engineer's design package. Additional controls documentation shall include PLC architecture diagrams, control panel Bill of Material, panel IO arrangement, loop drawings, and a control narrative of the overall plant control scheme.. The MBR Controls System shall communicate with the WWTP Main PLC via ethernet cable. The MBR Supplier will provide PLC and HMI programing for the MBR process system.
6. Specifications: Using CSI (50 Division MasterFormat), the MBR System supplier shall provide the Engineer with complete bid specifications for the MBR system and all supporting equipment, instrumentation, piping systems, valves, and control systems for integration into the Engineer's contract and bid documents.

<u>MBR WRF PROCESS COMPONENTS</u>

Raw wastewater from the City of San Luis collection system will be pumped to the City's West WWTP. A new headworks system (not part of the MBR System Vendor's scope), consisting of 6 mm fine screen, grit vortex, and 2 mm fine screen (with redundancy) will remove trash and inorganics from the influent. The screened influent will then be introduced to the MBR process for secondary and tertiary treatment. Treated effluent from the MBR process will be chlorinated prior to discharge in the Mohawk Canal that flows into Mexico. The disinfection process is not part of the MBR System Vendor's scope. The facility has an equalization tank in the Phase 1 MBR Upgrade that will capture diurnal flows above 3 MGD and will pump the stored volume back during diurnal low flow periods.

The WRF MBR Process will utilize an Activated Sludge Biological Nutrient Removal process (BNR) in the Bioreactor basins for removal of contaminant biological oxygen demand (BOD) and removal of organic nitrogen (TKN) and ammonia (i.e. "nitrification/ denitrification") by biological oxidation. Process flow shall be circulated between Aerobic and Anoxic zones to achieve treatment targets. Recirculation and

wasting from the Bioreactors will allow for a mixed liquor suspended solids set point to be maintained. The following are the minimum requirements for the bioreactors:

- Each tank shall be properly mixed to maintain suspension of mixed liquor suspended solids (MLSS) as their process flow is conveyed through.
- Aeration in the aerobic zones shall be through fine bubble diffusers.
- All aerobic and anoxic zones shall be equipped with instrumentation; such as temperature, pH, dissolved oxygen, and ORP probes, for system monitoring and control.
- MLSS probe shall be installed to continuously monitor the process MLSS
- Levels in the basins shall be monitored as needed for process control
- Aeration can be adjusted based on field conditions to minimize energy use. Aeration system shall have the ability to operate based on time operation and/or ORP/ DO operation.

Table 3: Bioreactor Minimum Design Parameters and Requirements

PHASE I BIOREACTORS DESIGN CRITERIA SUMMARY	
Type	MLE, BARDENPHO, OR OTHER Activated Sludge Process
Number of Treatment Trains	As Required by MBR System Vendor
Number of Aeration Basins	As Required by MBR System Vendor
Number of Anoxic Basins	As Required by MBR System Vendor
Aeration Type	Fine Bubble (Tube or Disc Diffusers)
Blower Type	As Provided by MBR System Vendor
Pumps and Mixers	As Provided by MBR System Vendor

1. Bioreactor Process and Equipment:

At a minimum, the following secondary process bioreactors shall be required along with the associated equipment:

a. Pre-Anoxic Basins
   1. Mixers
   2. Basin level sensor/transmitter

b. Pre-Aeration Basins
   1. Fine bubble diffusers
   2. Combination DO/temperature sensor/transmitter

c. Membrane Basins
   1. Membrane SMUs
   2. In-basin interconnecting air and permeate piping, terminating with an isolation valve prior to the headers**. Permeate and Air headers (larger than 3 inch) shall be provided by the installing contactor.**
   3. Membrane support brackets. Either guide rails when supported off the floor or beam assemblies when supported from the top of the basin.
   4. Pipe supports and support anchors for all Supplier-provided piping.
   5. Basin high and low-level switches

d. Permeate Collection System
   1. MBR permeate pumps if required
   2. MBR permeate control valves
   3. MBR permeate process instrumentation
   4. MBR permeate turbidimeters

e. Cleaning Systems

1. Maintenance Clean system pumps, actuated valves, instrumentation, and tanks.
2. Backwash system pumps, actuated valves, instrumentation, and tanks.
3. Recovery Clean system pumps, actuated valves, instrumentation, and backpulse storage tanks, if required.
4. Membrane basin drain pumping system, actuated valves, actuators, and instrumentation if required.

f. WAS Handling System
   1. WAS pumps
   2. WAS control valves
   3. WAS instrumentation

g. Supplemental (Process) Aeration System
   1. Process air blowers with one standby of equal or greater capacity.
   2. Process air flow control valves (if required)
   3. Process air instrumentation

h. Membrane Zone (Scour) Aeration System
   1. Scour air blowers with one standby of equal or greater capacity.
   2. Scour air flow control valves (if required)
   3. Scour air instrumentation

i. Internal Recycle System
   1. RAS pumps with shelf spare of equal capacity
   2. RAS flow control valves
   3. RAS instrumentation

j. Controls
   1. MBR control panel
   2. HMI and PLC programming

2. GENERAL EQUIPMENT REQUIREMENTS:

At a minimum, the process equipment shall meet the following requirements:

a. Submersible Mixers
   1. Submersible mixers shall be direct driven, close-coupled, guide-rail-mounted, non-clogging propeller type designed for mixing of raw or processed sewage. All components of the mixer shall be capable of continuous submerged operation. The mixer shall be sized to provide complete mixing.
   2. All major components of the submersible mixers shall be manufactured of 316 stainless steel. All bearings shall have a minimum B-10 rated bearing life of 100,000 hours.
   3. Mixers shall have integral motor thermal overload protection and seal failure (moisture) sensor.
   4. The mixers shall be provided with guide rails, guide brackets, and lifting cables. Mixer hoist shall be supplied by installing contactor.

b. Mixed Liquor Recirculation Pumps
   1. Mixed liquor recirculation pumps shall be capable of passing a three-inch spherical solid.
   2. Major pump components shall be cast iron, ductile iron, or stainless steel.
   3. Pumps shall be provided, including inlet and outlet pressure gauges and expansion joints.

4. Submersible pumps: Pumps shall have integral motor thermal overload protection and seal failure (moisture) sensor and be provided with guide pipes, guide brackets, and lifting cables.
5. Dry-mount pumps: Pumps shall be horizontal, self-priming centrifugal type, designed specifically for handling municipal waste. Motor shall include thermal overload protection.
6. Pumps shall be provided with redundancy.

c. Fine Bubble Diffuser Systems
1. Fine bubble diffuser systems shall include in-basin aeration piping, pipe drops, submerged manifolds, laterals, diffusers, drain pipes, pipe supports, and purge system.
2. All portions of the piping that are within 3-feet of the water surface or above the water surface shall be 304 or 316 SS. All mounting hardware shall be 316 SS.
3. Minimum Standard Oxygen Transfer Efficiency (SOTE) for fine bubble aeration system based on typical fine bubble aeration SOTE of 2.1% per foot submergence.
4. Flux at design flow shall not exceed 1.3 scfm/ft^2. Design maximum flux shall not exceed 2 scfm/ft^2.
5. The diffuser membranes shall be constructed of silicon only.

d. MBR Membranes
The MBR membranes shall be located in dedicated membrane separation tanks to provide liquid-solid separation and filtration simultaneously, providing a physical barrier to suspended solids and micro-organisms, and eliminating the need for separate clarifiers and tertiary filter units.
1. The membranes shall meet the following criteria and the design parameters listed in Table 4, below:
   a. The membrane shall be either hollow fiber or flat-plate type only.
   b. Hollow Fiber shall have reinforced ultrafiltration membrane fiber with nominal pore size of 0.1 micron or less.
   c. The flat-plate membrane shall have microfiltration flat sheets with a nominal pore size of 0.2 micron or less.
   d. Flux shall be defined as the gallons of flow per day per square foot of membrane area (gfd). Additional definitions of flux that are used to characterize design criteria and membrane performance include:
      i Permeate flow: Flow rate required to extract the MMADF or MDF through the membranes, accounting for loss in flow from the relax, backpulse, or any operation that ceases permeate production
      ii Net Instantaneous Flux: Calculated by dividing the permeate flow produced (available for discharge) for a given flow condition (MMADF or MDF) by the working membrane area.

Table 4: Membrane Minimum Design Parameters and Requirements

MEMBRANE DESIGN CRITERIA SUMMARY		
Type	Hollow Fiber	Flat Sheet
Number of MBR Trains	TBD by MBR Vendor (Min of 3 trains)	TBD by MBR Vendor (Min of 3 trains)
Maximum Design MLSS in MBR Tank	10,000 mg/L	15,000 mg/L

Max Net Instantaneous Flux @ MMADF	12.5 gpd/ft^2	14.5 gpd/ft^2
Max Net Instantaneous Flux @ MMADF (N-1)	16.5 gpd/ft^2	21.5 gpd/ft^2
Max Net Instantaneous Flux @ MDF (24-hr) (N-1)	22.5 gpd/ft^2	28 gpd/ft^2

(N-1) refers to 1 train being out of service.

2. Each Membrane train shall consist of one or more Submerged Membrane Units (SMU). Each SMU shall be:
   a. Prefabricated, preassembled and factory certified before shipment to the site.
   b. Provided complete, with all necessary components, accessories and appurtenances required to make a complete and operable system.
   c. Furnished with 304 SS housing, appurtenances and fasteners (including nuts, bolts, screws, cables, washers). If Recovery Cleaning, where membrane modules are submerged in sodium Hypochlorite or in acid solution for more than 1 hour, is required as part of routine maintenance, 316L shall replace 304 SS as fabrication material.
   d. Furnished with integral diffusers designed to promote efficient air scouring of Membrane Elements.
   e. The SMU shall include all required support systems for mounting inside the membrane basin. Floor mounted membrane units shall include a guiderail system for each unit. SMUs that hang from the top of the basin shall include all required support beams, angle iron and other appurtenances for a complete support system.

e. Permeate Pumps
   1. Permeate pumps shall be required when the hydraulic loading cannot be met using gravity filtration.
   2. Pumps shall be sized to handle peak instantaneous flow as defined in this Specifications, as well as rates associated with backwashing, maintenance cleaning, and aerator flushing.
   3. Pumps shall be provided, inclusive of inlet and outlet pressure gauges and expansion joints.
   4. Pumps shall have integral motor thermal overload protection.
   5. Pumps shall be provided with redundancy.

f. Blowers
   1. Blowers shall be provided complete with sound enclosure, inlet filters, discharge silencers, pressure relief valves, check valves, motors, temperature and pressure gauges, over-temperature sensor/switch, expansion joints, belts, and baseplates.
   2. Process aeration blowers shall be sized to maintain a residual DO of 2.0 mg/l at MMADF flow rates and loadings and a minimum of a 2:1 turndown. Process aeration system shall include a standby blower of equal or greater capacity than the duty blowers.
   3. MBR scour air blowers shall be sized such than sufficient scour air is provided to support MMADF flows as described in this Specification without requiring additional maintenance cleans. The scour air system shall include a standby blower of equal or greater capacity than the duty blowers
   4. MBR scour air blowers shall accommodate a minimum surge or 1.5 psig under normal operating conditions.

g. Cleaning Systems
   1. The Cleaning Systems shall include backwash, maintenance clean, and recovery clean systems as required by the Supplier's specific systems.

2. Cleaning Systems shall be inclusive of all chemical feed tanks, chemical feed pumps, valves, instrumentation, controls, and all other ancillary equipment necessary for complete cleaning operation. **CIP system utilized by MBR system supplier must be skid mounted and fully assembled prior to shipment to the jobsite.**
3. Supplier shall define building space to be allotted for all Cleaning systems, including space for:
    a. Chemical storage with level detection
    b. Mixing tanks or equipment
    c. Cleaning system equipment
    d. Safety equipment (i.e., eye wash, gas detection, etc.)
    e. Containment and neutralization of spent chemicals. Containment space shall include space necessary for separation of incompatible materials to meet International Building Codes and International Fire Codes.
4. The system shall be designed to clean the membranes in-place without requiring removal from tanks. If membrane drain pumps are required to remove MLSS from basin prior to CIP cleaning, **MBR system supplier shall provide all required pumping equipment, valves, and instrumentation for a complete fully automated, operational system.** Membrane tank drain pump system shall be sized to pump down membrane zone completely in less than 15 minutes and shall be a dedicated system (duty and standby pumps) and not be combined with permeate collection, RAS, or other plant pumping systems.
5. The cleaning systems shall be sized to clean one Membrane Basin at a time and allow the other Membrane Basins to remain in production.
6. All components of the cleaning systems shall be compatible with cleaning solutions recommended by the Supplier for its system.
7. Liner system shall be included to protect MBR concrete basin from corrosive damage.

h. Waste Activated Sludge (WAS) Pumps
    1. WAS pumps shall be capable of passing a three-inch spherical solid.
    2. The pumps shall be sized to transfer the expected MMADF waste sludge volumes in less than 3 hours.
    3. Major pump components shall be cast iron, ductile iron, or stainless steel.
    4. Submersible pumps: Pumps shall have integral motor thermal overload protection and seal failure (moisture) sensor and provided with guide pipes, guide brackets, and lifting cables.
    5. Dry-mount pumps: Pumps shall be horizontal, self-priming centrifugal type, designed specifically for handling municipal waste.
    6. Pumps shall be provided with redundancy.

i. Vacuum Air Removal System (if required)
    1. If applicable, each Membrane Unit shall include a vacuum system to prime the filtrate suction pump. The vacuum will be created by an eductor.
    2. Removal system shall be inclusive of a compressed air supply of 30 scfm at 90 psi. The eductor shall be capable of pulling a minimum of 5 scfm of air at -18 inHg or as required by the Membrane System Supplier.
    3. The system shall be provided with redundancy.

j. Valve Actuators

1. In order to reduce operating noise levels, it is preferred that all valves be electrically actuated valves.
2. If pneumatic valves are provided by the Supplier
   a. Air supply requirements shall be defined by the MBR System Supplier
   b. Supplier's scope shall include a duty and standby compressed air package. Each package compressor unit shall consist of skid-mounted three-lobe positive displacement blowers in noise suppression enclosures with a maximum of 85 decibels at 3 feet, intake filters, noise suppression discharge piping, and electrical motors and soft starters.

k. Piping
   1. All MBR System air scour piping shall be Type 304 stainless steel.
   2. Permeate piping shall be schedule 80 PVC.
   3. Piping shall have welded, glued, flanged, or mechanical groove (Victaulic) connections.
   4. Pipe supports shall be 304 stainless steel Unistrut (or equivalent) systems or 304 stainless steel angle and structural shapes with stainless hardware, clamps, and guides
   5. Transitions from MBR Vendor piping to Contractor's piping shall use ANSI 150-pound flanges unless otherwise noted or coordinated with the Contractor.
   6. Insulation, heat tracing and or painting shall be provided by the Contractor
   7. MBR system vendor shall include in basin air and permeate piping only as part of the bid.

l. Electrical Requirements
   1. Electrical Power Connection Volt/Phase/Hz: 480/3/60.
   2. Motor and solenoid valve classification: Meets NFPA 820 Classification
   3. Interior electrical/control panel enclosure type: Meets NFPA 820 Classification
   4. Remote E-Stops/Local Control Stations: Meets NFPA 820 Classification
   5. Electrical connections shall be flexible and of sufficient length to allow servicing of all components.

m. MBR System Controls
   1. General: All controls necessary for a fully automatic operation of the complete MBR system shall be provided within proper enclosures. The MBR Vendor shall be responsible for proper sizing and function of the instrumentation and controls. The Vendor shall supply UL listed control panels and all local control stations for automatic control of the equipment proposed.
      a. The control panel(s) shall be operated within the project's ambient temperature range.
      b. Available incoming power is 480V, 3 Phase, 60 Hz. Equipment Control panels shall be designed to accept the available power supply and shall include a step-down transformer as needed to power for all control instrumentation and communication relays, etc.
      c. HMI graphics shall be provided to be installed on the WWTP Main SCADA System/Network.
      d. Provide complete documented PLC ladder program listing.
      e. Provide defined address range with all equipment related alarms, warning, analog values and equipment status for interfacing with the WWTP Main SCADA and Dewatering PLC via Ethernet.
   2. Components:
      a. Control Panels

i Enclosure(s) shall meet NFPA 820 Classifications and shall be constructed from 304 SSTL (minimum) for outdoor installations, suitable for free-standing, stanchion-mounting, or wall-mounting.

ii The control panel will include automatically climate control with filtered air louvers if required to maintain temperature inside each enclosure below the maximum operating temperature rating of the components inside the enclosure. Housing shall be constructed of corrosion resistant materials.
   a) Provide calculations for cooling and heating load requirements.
   b) Provide thermostats to automatically control heating and cooling requirements without need of manual operation of a heating/cooling transfer switch.
   c) In hazardous or corrosive environment, the climate control system shall be a controlled closed-loop ventilation fans or closed-loop air conditioners. In addition, the heating and coiling elements including external shall be Heresite-coated or equal.

iii Main Control Panel shall be designed with a SCCR rating of 18KA at 480VAC minimum and labeled as such, unless otherwise specified.

iv All terminals utilized in the main panel shall be 600V rated terminals and 20% spare terminal space shall be provided for any potential future revisions.

v Control panel shall be equipped with the necessary IEC starters and drives for each equipment item, as needed

vi The Main Control Panel shall include at a minimum the following:
   a) Main fusible disconnect with lockable operator.
   b) Physical Hand/Off/Auto (HOA) Selector and Push/pull E-Stop button for each major piece of equipment.
   c) Backup power UPS
   d) Network switch
   e) Programmable control relay with minimum of 5 cycle timers
   f) Fuses and breakers
   g) Motor overload sensor
   h) Panel power light
   i) Reset pushbutton
   j) Emergency stop pushbutton
   k) Pilot light indicators
   l) Elapsed run-time meter for each equipment
   m) Indication for "Power On", and necessary faults for each equipment.
   n) Name plates
   o) Control panel wiring
   p) Two spare digital inputs
   q) Two spare analog inputs
   r) Two spare dry contact outputs
   s) Variable Frequency Drive(s) (VFDs) as required
   t) PLC Controls shall include the following:
      i. Programmable Logic Controller (PLC)- Allen Bradley
      ii. Variable Frequency Drive(s) (VFDs)
      iii. HMI and HMI programmable functions
      iv. PLC shall be capable of communicating via Allen Bradley Ethernet IP Communication Protocol

b. Local Control Push Button Station
   i Include local control push button station for each major piece of equipment (screw press, conveyors, pumps, polymer system). Enclosure shall meet NFPA 820 Classification for the installation area. Local push button station must be local to the equipment to maintain requirements of local safety codes as determined by the Engineer.
   ii Local station shall be mounted within 10 feet or as close to the equipment as safely possible and be field wired by the electrical subcontractor to the corresponding terminal inputs in the main control panel.
   iii The remote pushbutton station shall include hand/off/auto switch for each motor and an emergency stop.

3. OTHER REQUIREMENTS

Proprietary Designs

If a proprietary or otherwise US Patented component is proposed by the Vendor, the Vendor shall indicate such in their proposal and shall include all costs for licensing and/or usage fees required by the patented holder within the proposal. The Vendor shall further indemnify and warrant to the Contractor and Owner that no patent violations exist. If a patent violation claim is made due to the scope of supply for this project, the Vendor shall be fully responsible for all costs associated with the amicable settlement of such dispute.

PAYMENT TERMS AND CONDITIONS

A. The City shall make progress payments on account of the Contract Price on the basis of Vendor's Applications for Payment as follows:

10% on Approved Submittal(s)

a. Equipment submittal is required prior to the execution of this contract for the Engineer to review and approve. However, billing and payments will not commence until the assigning of this contract to the Construction Contractor, where the Construction Contractor will issue the Notice to Proceed to Order Equipment to the Vendor.

60% on Delivery

10% on successful completion of the Demonstration Period

15% on Start Up & Training

5% on Delivery of Final O&M Manual(s). Operation & Maintenance Manuals must be submitted and approved prior to shipping equipment to the jobsite.

B. No payment application will be accepted nor will any payments be distributed until this contract has been assigned. After assignment payments will be made by the Construction Contractor.

This request for proposals was prepared by Pacific Advanced Civil Engineering, Inc. (PACE) at the direction of the City of San Luis. The City of San Luis and PACE will review the proposals and select the preferred equipment Vendor to form the basis of design for the project. The City of San Luis and PACE reserve the right to reject any and all proposals. Proposers should contact PACE with all questions regarding this proposal. All questions shall be submitted via email a minimum of 2 weeks prior to the final bid date and should be directed to Mr. Nathaniel Tesch, Pacific Advanced Civil Engineering, Inc. at ntesch@pacewater.com. All questions and responses will be posted on the City's website via an addendum. It is the proposer's responsibility to check the website at www.sanluisaz.gov. The proposal shall include an acknowledgement of all addendums posted on the website. The last addendum will be posted 1 week prior to the due date.

Final Proposals shall be submitted via email in PDF format to:
ntesch@pacewater.com

Optional hardcopies can be sent to:
Pacific Advanced Civil Engineering, Inc.
Attention: Nathaniel Tesch, EIT
8723 E. Via de Commercio – Ste. A-204
Scottsdale, AZ 85258
Phone: (602) 695-4679
Fax: (480) 751-1810

EXHIBIT A - REFERENCE LIST

REF #	PROJECT NAME	YEAR COMPLETED	PROJECT LOCATION	MBR DESIGN CAPACITY (MGD)	REFERENCE CONTACT NAME	REFERENCE CONTACT PHONE #	REFERENCE CONTACT EMAIL ADDRESS
1							
2							
3							
4							
5							
6							

PERFORMANCE BOND
FOR PROCUREMENT CONTRACTS

Any singular reference to Seller, Surety, Buyer or other party shall be considered plural where applicable.

SELLER (Name and Address):

SURETY (Name and Address of Principal Place of Business):

BUYER (Name and Address):

CONTRACT
Date:
Amount:
Description (Name and Location):

BOND
Date (Not earlier than Contract Date):
Bond Number:
Amount:
Modifications to this Bond Form:

Surety and Seller, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent or representative.

Seller as Principal		**Surety**	
Company:	(Corp. Seal)	Company:	(Corp. Seal)
Signature:		Signature:	
Name and Title:		Name and Title:	
		(Attach Power of Attorney)	
		Address:	
		Telephone Number:	

(Space is provided below for signatures of additional parties, if required.)

Seller as Principal		**Surety**	
Company:	(Corp. Seal)	Company:	(Corp. Seal)
Signature:		Signature:	
Name and Title:		Name and Title:	
		Address:	
		Telephone Number:	

1. Seller and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to Buyer for the performance of the Contract, which is incorporated herein by reference. For purposes of this bond, Buyer means Buyer's assigns, if and when Buyer has assigned the Contract.

2. If Seller performs the Contract, Surety and Seller have no obligation under this Bond, except to participate in conferences as provided in paragraph 3.1.

3. If there is no Buyer Default, Surety's obligation under this Bond shall arise after:

3.1. Buyer has notified Seller and Surety pursuant to paragraph 10 that Buyer is considering declaring a Seller Default and has requested and attempted to arrange a conference with Seller and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. (If Buyer, Seller and Surety agree, Seller shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Buyer's right, if any, subsequently to declare a Seller Default); and

3.2. Buyer has declared a Seller Default and formally terminated Seller's right to complete the Contract. Such Seller Default shall not be declared earlier than 20 days after Seller and Surety have received notice as provided in paragraph 3.1; and

3.3. Buyer has agreed to pay the Balance of the Contract Price to:

1. Surety in accordance with the terms of the Contract;

2. Another seller selected pursuant to paragraph 4.3 to perform the Contract.

4. When Buyer has satisfied the conditions of paragraph 3, Surety shall promptly and at Surety's expense take one of the following actions:

4.1. Arrange for Seller, with consent of Buyer, to perform and complete the Contract; or

4.2. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or

4.3. Obtain bids or negotiated proposals from qualified sellers acceptable to Buyer for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Buyer and Seller selected with Buyer's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds issued on the Contract, and pay to Buyer the amount of damages as described in paragraph 6 in excess of the Balance of the Contract Price incurred by Buyer resulting from Seller Default; or

4.4. Waive its right to perform and complete, arrange for completion, or obtain a new seller, and with reasonable promptness under the circumstances, either:

1. determine the amount for which it may be liable to Buyer and, as soon as practicable after the amount is determined, tender payment therefor to Buyer; or

2. deny liability in whole or in part and notify Buyer citing reasons therefor.

5. If Surety does not proceed as provided in paragraph 4 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Buyer to Surety demanding that Surety perform its obligations under this Bond, and Buyer shall be entitled to enforce any remedy available to Buyer. If Surety proceeds as provided in paragraph 4.4, and Buyer refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Buyer shall be entitled to enforce any remedy available to Buyer.

6. After Buyer has terminated Seller's right to complete the Contract, and if Surety elects to act under paragraph 4.1, 4.2, or 4.3, then the responsibilities of Surety to Buyer shall not be greater than those of Seller under the Contract, and the responsibilities of Buyer to Surety shall not be greater than those of Buyer under the Contract. To a limit of the amount of this Bond, but subject to commitment by Buyer of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

6.1. The responsibilities of Seller for correction or replacement of defective Goods and Special Services and completion of the Contract;

6.2. Additional legal, design professional and delay costs resulting from Seller's Default, and resulting from the actions or failure to act of Surety under paragraph 4; and

6.3. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Seller.

7. Surety shall not be liable to Buyer or others for obligations of Seller that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Buyer or its heirs, executors, administrators, successors, or assigns.

8. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Goods and Services are located and shall be instituted within two years after Seller Default or within two years after Seller ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to Surety, Buyer or Seller shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the Goods were to be delivered and the Special Services were to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

12.1. Balance of the Contract Price: The total amount payable by Buyer to Seller under the Contract after all proper adjustments have been made, including allowance to Seller of any amounts received or to be received by Buyer in settlement of insurance or other Claims for damages to which Seller is entitled, reduced by all valid and proper payments made to or on behalf of Seller under the Contract.

12.2. Contract: The agreement between Buyer and Seller identified on the signature page, including all Contract Documents and changes thereto.

12.3. Seller Default: Failure of Seller, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

12.4. Buyer Default: Failure of Buyer, which has neither been

remedied nor waived, to pay Seller as required by the Contract or to perform and complete or comply with the other terms thereof.

EXHIBIT C - EQUIPMENT & LUMP SUMP WORKSHEET

SAN LUIS WEST WWTP Membrane Bioreactor Package Plant Equipment and Design Criteria	
Design Parameters	
PH 1 MMADF	3.0 MGD
PH 1 MDF	3.9 MGD
PH 1 PHF	7.5 MGD
PH 2 MMADF (for reference only)	4.5 MGD
PH 3 MMADF (for reference only)	6 MGD
Influent Loading	
BOD (mg/L)	360 mg/L
TSS (mg/L)	300 mg/L
TN (mg/L)	80 mg/L
FOG (mg/L)	42 mg/L
Hardness as CaCO3 (mg/L)	600 mg/L
Expected Effluent Quality	
BOD (mg/L)	<10 mg/L
TSS (mg/L)	<10 mg/L
TN (mg/L) - 5-sample rolling geometric mean	<10 mg/L
Fecal Coliform (CFU/100mL)	Non-Detect for 4 out of 7 daily samples, Single sample max NTE 23 CFU
Turbidity (NTU)	< 2 NTU (24-hr ave), NTE 5 NTU
MBR System	
MBR System Vendor Name	
Model	
Phase 1 MBR Bioreactor	
Bioreactor Activate Sludge Process (i.e. MLE, Bardenpho, Ext Air, etc.)	
Number of Secondary Process Trains	
Total Aerobic Volume per Train (gal)	
Total Anoxic Volume per Train (gal)	
Hydraulic Retention Time (hrs)	
Solids Retention Time (days)	
Secondary Process Design MLSS (mg/L)	
Aeration Basin Design	
Number of Aeration Basin or Zone per Train	
Aeration Basin/Zone Operating Dimensions (LxWxD)(ft)	
Design DO (ppm)	
Design SOTE (%)	
Design SOTR (lbs/hr)	
Design SCFM	
Fine Bubble Aeration Diffuser Type (circular, tube, panel, etc.)	
Brand and Model	
Membrane material	
%SOTE per ft	
Design SCFM/ft^2 at MMADF	
Design SCFM/ft^2 at MDF	
Diffuser SCFM/ft^2 Range (min to max)	
Aeration Blower Type (Rotary lobe, Centrifugal, Turbine, etc.)	
Blower Brand and Model	
Aeration Blower Quantity (including redundant blower)	
Aeration Blower Motor (HP)	
Air Flow Rate per Blower (SCFM)	
Blower Operating Pressure at Blower Discharge (psi)	
Anoxic Basin Design	
Number of Anoxic Basin/Zone per Train	
Anoxic Basin/Zone Operating Dimensions (LxWxD)(ft)	
Anoxic Mixer Type (Submersible Propeller, surface mixer, etc)	
Mixer Brand and Model	
Quantity of Mixers per Anoxic Basin	
Mixer HP	
RAS Pump Design	
RAS/ FAS Pump Type	
Pump Brand and Model	
RAS/ FAS Pump Design Capacity (gpm @ TDH ft) per pump	
Quantity of RAS/FAS pumps	
RAS/ FAS Pump HP	
MBR Design	
Number of MBR Basins/ Trains	
MBR Basin Operating Dimensions (LxWxD)(ft)	
Membrane Type (hollow, flat plate)	
Membrane Brand and Model	
Effective Membrane Pore Size (micron)	
Quantity of Cassettes or Banks per Train	
Quantity of Modules per Cassette or Bank	
Quantity of Filtration area per Module (sf)	
Filtration area per Train (sf)	
Total Filtration area (sf)	
Design MBR Train MLSS (mg/L)	
Total Time of Effluent Production (excluding relax, backpulse, etc.) per day (mins/day)	
Membrane Net Instantaneous Flux at MMADF, 20 deg C (gfd)	
Membrane Net Instantaneous Flux at MMADF (with 1 Train out), 20 deg C (gfd)	
Membrane Net Instantaneous Flux at MDF (with 1 Train out), 20 deg C (gfd)	
Membrane Max Instantaneous Flux (4-hr), 20 deg C (gfd)	
Max Transmembrane Pressure (psi)	

Permeate Pump Type	
Permeate Pump Brand and Model	
Permeate Pump Quantity	
Permeate Pump Design Capacity (gpm at TDH ft) per pump	
Permeate Pump Motor (HP)	
WAS Pump Type	
WAS Pump Brand and Model	
WAS Pump Quantity	
WAS Pump Design Capacity (gpm at TDH ft) per pump	
WAS Pump Motor (HP)	
MBR Scour Air Requirement per Train (SCFM)	
MBR Scour Blower Type (Rotary lobe, Centrifugal, Turbine, etc.)	
Blower Brand and Model	
Blower Quantity	
Blower Motor (HP)	
Air Flow Rate per Blower (SCFM)	
Blower Operating Pressure at Blower Discharge (psi)	
Vacuum Air Removal System (Brand)	
Quantity of Vacuum System	
Relaxation of Membranes required? (y/n)	
Backpulse of Membranes required? (y/n)	
Backpulse Tank Volume (diameter and gallons)	
Chemical 1	
Chemical 1 Tank (Diameter (ft), Height (ft), and Storage Gallons)	
Chemical 2	
Chemical 2 Tank (Diameter (ft), Height (ft), and Storage Gallons)	
Clean-In-Place System Brand and Model	
Types of Pump for Chemical 1 (progressive cavity, rotary, etc.)	
Number of Pumps for Chemical 1	
Flow Capacity of each Pump for Chemical 1 (gph)	
Types of Pump for Chemical 2 (progressive cavity, rotary, etc.)	
Number of Pumps for Chemical 2	
Flow Capacity of each Pump for Chemical 2 (gph)	
Capital Cost	
Total Phase 1 MBR Equipment Lump Sum Cost ($)	
Total Freight (FOB Jobsite) ($)	
Spare Parts Cost ($)	
Performance Bond Cost ($)	
Inspection/Start-Up/Commissioning ($)	
Clean Water Testing ($)	
Seeding Assistance ($)	
Demonstration Period ($)	
Training ($)	
Total Phase 1 MBR System Capital Cost ($) (Sum of Items above)	
Warranty Extension ($)	
Performance Bond Extension ($)	
BABA Compliance ($)	
First 5-yr Full Service Contract ($/yr)	
2nd 5-yr Option Full Service Contract ($/yr)	
Operational Cost	
Estimated WRF Power Consumption (Kwh per day)	
Total Ave Chemical ($/month)	
Chemical 1 Unit Cost ($/ga)	
Chemical 2 Unit Cost($/gal)	
Chemical 1 ($/mth)	
Chemical 2 ($/mth)	
Electrical and Controls	
Main PLC Brand and Model	
Guarantee	
Guarantee Statement Provided (y/n)	
Warranty	
MBR Equipment System Warranty Period (months)	
Extended Warranty Period Additional Duration (months)	
Service Support	
Spare Parts List Included (y/n)	
Service Maintenance Contract Included (y/n)	
Location of Parts Distribution Center (city, distance in miles to project)	
Location of Design Support Center (city, distance in miles to project)	
Delivery Schedule	
Submittal Preparation Period (months)	
Fabrication Period (months)	
Delivery Period (months)	
Schedule Delay Statement Provided (y/n)	

EXHIBIT D - EXCLUSIONS/EXCEPTION FORM

Please identify exceptions to any of the specifications provided in the RFP Package. Please submit this form with your proposal. If no exceptions are taken, enter "None" for the first item. Make additional copies as necessary. Please note that these exceptions do not mitigate the responsibility of the MBR System Vendor, in any way, whatsoever, on performance, equipment quality, maintainability, and operability.

EXCPT #	Proposal Page #	Section #	Paragraph #	Exception Taken

EXHIBIT E - ADDENDUM ACKNOWLEDGEMENT		
ADDENDUM	**DATE ISSUED**	**SIGNATURE**