



City of Fort Bragg

416 N Franklin Street
Fort Bragg, CA 95437
Phone: (707) 961-2823
Fax: (707) 961-2802

Meeting Agenda Special City Council

**THE FORT BRAGG CITY COUNCIL MEETS CONCURRENTLY AS
THE FORT BRAGG MUNICIPAL IMPROVEMENT DISTRICT NO. 1
AND THE FORT BRAGG REDEVELOPMENT SUCCESSOR
AGENCY**

Monday, June 21, 2021

5:30 PM

Via Video Conference

Special Meeting

CALL TO ORDER

ROLL CALL

PLEASE TAKE NOTICE

The Governor's Executive Orders N-25-20, N-29-20, and N-08-21 suspend certain requirements of the Brown Act. City Councilmembers and staff will participate by Zoom video conference at tonight's Special City Council meeting.

The meeting will be live-streamed on the City's website at <https://city.fortbragg.com/> and on Channel 3. Public comments regarding matters on the agenda may be made by joining the Zoom video conference and using the Raise Hand feature when the Mayor or Acting Mayor calls for public comment. Any written public comments received after agenda publication will be forwarded to the Councilmembers as soon as possible after receipt and will be available for inspection at City Hall, 416 N. Franklin Street, Fort Bragg, CA 95437. All comments will become a permanent part of the agenda packet on the day after the meeting or as soon thereafter as possible, except those written comments that are in an unrecognized file type or too large to be uploaded to the City's agenda software application. Public comments may be submitted to City Clerk June Lemos at jlemos@fortbragg.com.

ZOOM WEBINAR INVITATION

*You are invited to a Zoom webinar.
When: Jun 21, 2021 05:30 PM Pacific Time (US and Canada)
Topic: Special City Council Meeting*

*Please click the link below to join the webinar:
<https://zoom.us/j/97457413459>
Telephone: US: +1 669 900 9128 or +1 346 248 7799 (*6 mute/unmute; *9 raise hand)
Webinar ID: 974 5741 3459*

TO SPEAK DURING PUBLIC COMMENT PORTIONS OF THE AGENDA VIA ZOOM, PLEASE JOIN THE MEETING AND USE THE RAISE HAND FEATURE WHEN THE CHAIR OR ACTING CHAIR CALLS FOR PUBLIC COMMENT ON THE ITEM YOU WISH TO ADDRESS.

1. CONDUCT OF BUSINESS



City of Fort Bragg

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Text File

File Number: 21-317

Agenda Date: 6/21/2021

Version: 1

Status: Consent Agenda

In Control: City Council

File Type: Resolution

Agenda Number: 1A.

Receive Report and Consider Adoption of City Council Resolution Authorizing the City Manager to Execute Purchase Order/Purchase Agreement for the Purchase of a Desalination-Reverse Osmosis Treatment System, Amount Not to Exceed \$335,818.50 (Account No. 651-6130-0731)



AGENCY: City Council
MEETING DATE: June 21, 2021
DEPARTMENT: Public Works
PRESENTED BY: J. Smith
EMAIL ADDRESS: Jsmith@fortbragg.com

AGENDA ITEM SUMMARY

TITLE:

Receive Report and Consider Adoption of City Council Resolution Authorizing the City Manager to Execute Purchase Order/Purchase Agreement for the Purchase of a Desalination–Reverse Osmosis Treatment System, Amount Not to Exceed \$335,818.50 (Account No. 651-6130-0731)

ISSUE:

The flow in the Noyo River, which is our primary water source in summer/fall months, is at levels below 1977, which is our worst drought on record. Staff has been working with the State Water Resources Control Board, Cal OES, Department of Drinking Water and other state agencies for several months planning for alternative sources including use of a portable desalination plant to supplement our surface water sources.

ANALYSIS:

At its June 14, 2021 meeting, the City Council approved funds to answer shortcomings of the water supply from the City's water sources during this drought. Staff reviewed a number of potential supplemental water sources that might provide relief to our potential low flow situation. Desalination has been found to provide the most likely candidate for success as we near the more challenging months of the drought. With product lead times for equipment continuing to lengthen due to availability and the expectation of water challenges during September, the need to submit our order to hold our place in the queue is necessary.

Staff reviewed four proposals and found Aqua Clear Water Treatment Specialists to have provided a responsive bid at the lowest price.

Aqua Clear – \$298,800

Purestream Services – \$396,000

Pure Aqua, Inc. – 321,377

WesTech – \$621,620

RECOMMENDED ACTION:

Adopt Resolution authorizing the City Manager to execute the purchase and related agreements for the purchase of the equipment.

ALTERNATIVE ACTION(S):

1. Do not adopt the Resolution.
2. Provide alternative direction to staff.

FISCAL IMPACT:

The purchase of the described equipment may provide necessary water supply to reduce economic impact and provide necessary fire flows.

GREENHOUSE GAS EMISSIONS IMPACT:

Minimal impact is expected.

CONSISTENCY:

N/A

IMPLEMENTATION/TIMEFRAMES:

Procurement process will begin June 22, 2021.

ATTACHMENTS:

1. Resolution
2. Aqua Clear technical proposal

NOTIFICATION:

N/A.

RESOLUTION NO. ____-2021

RESOLUTION OF THE FORT BRAGG CITY COUNCIL AUTHORIZING THE CITY MANAGER TO EXECUTE PURCHASE ORDER/PURCHASE AGREEMENT FOR THE PURCHASE OF A DESALINATION - REVERSE OSMOSIS TREATMENT SYSTEM, AMOUNT NOT TO EXCEED \$335,818.50 (ACCOUNT NO. 651-6130-0731)

WHEREAS, the City of Fort Bragg has experienced significantly less rainfall over the past two years placing the City in an extreme drought condition; and

WHEREAS, the water flows from the City’s three raw water sources continue on a downward trend; and

WHEREAS, the high tides during periods of low flow levels on the Noyo River increases salinity content impairing the City’s ability to replenish water supply from the Noyo River; and

WHEREAS, the weather forecasts continue to show no significant rainfall in the area in the coming weeks; and

WHEREAS, on March 5, 2021, the USDA declared that 50 counties in California, including Mendocino County, were designated as a primary natural disasters area due to recent drought; and

WHEREAS, on April 21, 2021, Governor Newsom declared a state of emergency in Mendocino County due to drought conditions; and

WHEREAS, the City Council approved a budget amendment to set aside funds for the procurement of water emergency related equipment; and

WHEREAS, Coleman Engineering submitted a request to vendors, on the City’s behalf, for a desalination treatment system; and

WHEREAS, four companies provided proposals for a treatment unit that fit the City’s specifications; and

WHEREAS, Ryan Process submitted the lowest and most comprehensive bid from Aqua Clear Water Treatment Specialists; and

NOW, THEREFORE, BE IT RESOLVED that the Fort Bragg City Council does hereby approve the purchase of the Desalination – Reverse Osmosis Treatment System in an amount not to exceed \$335,818.50 and authorizes the City Manager to sign any purchase agreements, purchase orders or documents associated therewith.

The above and foregoing Resolution was introduced by Councilmember _____, seconded by Councilmember _____, and passed and adopted at a special meeting of the City Council of the City of Fort Bragg held on the 21st day of June, 2021, by the following vote:

- AYES:**
- NOES:**
- ABSENT:**
- ABSTAIN:**

RECUSED:

BERNIE NORVELL
Mayor

ATTEST:

June Lemos, CMC
City Clerk

Technical Proposal FORT BRAGG REVERSE OSMOSIS SYSTEM Model AC-6680

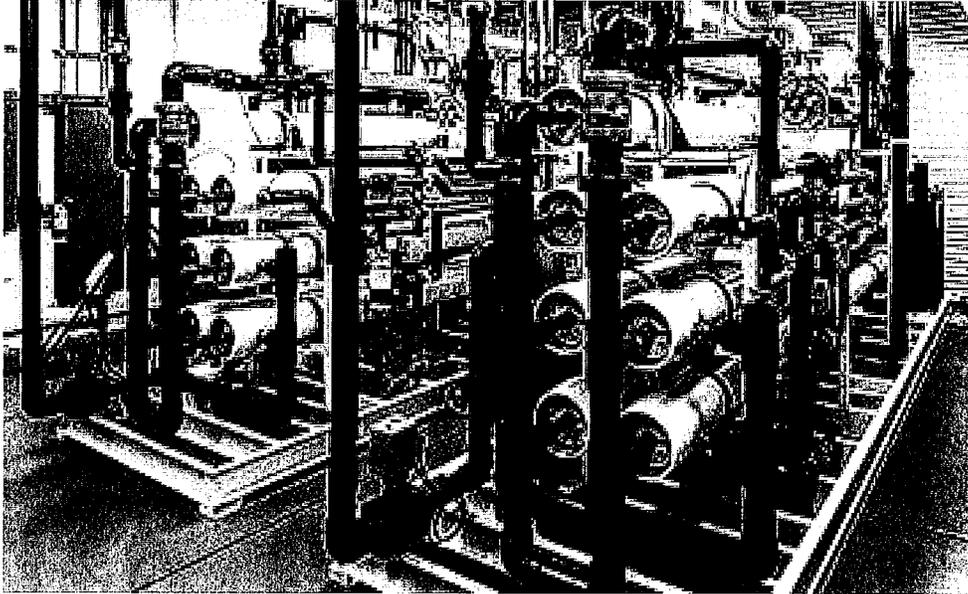


Image shown may differ from proposed system

Prepared for City of Fort Bragg

Fort Bragg, CA

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June 9, 2021

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Client	City of Fort Bragg
Location	Fort Bragg, CA
Project Title	Reverse Osmosis Skid
Engineering Firm	N/A
Project No.	TBD
Contact Person(s)	Heath Daniels – Operations Supervisor
ACI Document No.	QUO-001630-20210510
Status	Final proposal
Date	June 9, 2021
Revision	2

Aqua Clear Contact Information

Steven Peck
 Business Development

M +1 619-540-4328
 E-MAIL: stevenpeck@aquaclearllc.com

Revision history	Reason	Date	By
0	Issued for proposal	05/11/21	S. Peck
1	Change in GPD & add Concentrate Recovery	06/07/21	S. Peck
2	Add feed pump	06/09/21	S. Peck

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Aqua Clear Water Treatment Specialists

1 Introduction

Aqua Clear, Inc. is pleased to present this proposal in response to *City of Fort Bragg's* request for a *Reverse Osmosis System* to produce purified water at the *water treatment* facility located in *Fort Bragg, CA*.

Founded in 1993, Aqua Clear Water Treatment Specialists is the Southern California cleantech provider of technology and service for both industrial water purification and wastewater reclamation.

Aqua Clear's mission is to develop and grow lasting relationships with clients through listening to and serving their business goals while providing access to integrated solutions for purification of water and reclamation of wastewater.

Aqua Clear's cost-effective solutions are site-specific to maximize the operational efficiency and reduce the environmental footprint of our client's facilities deriving payback from the cascading reuse of water within their facility.

Aqua Clear manufactures and field services a variety of filtration, membrane (RO, UF, CMF, EDI), equipment. Aqua Clear also formulates a variety of water treatment chemicals for coolers, boilers, membranes and clarifiers and provides chemical treatment programs and onsite service.

Aqua Clear offers RO membrane healthcare programs, monitoring and service to extend the life of the membranes. We provide membrane chemicals for the RO skid and have the capacity to perform membrane fouling analysis and offsite cleaning.

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2 Project scope

Aqua Clear will supply a *Reverse Osmosis System* as described within this proposal based on information provided by *City of Fort Bragg* on June 4, 2021. Aqua Clear will be responsible for the fabrication of the skid (and will offer startup assistance and operator training as an option).

2.1. Equipment and Capacity

The *Reverse Osmosis System* will produce purified water at a total capacity 288,000 gallons per day (200 gpm) based on the specifications provided by City of Fort Bragg. This system will consist of two (2) subsystems (RO and CIP)*.

The RO subsystem will consist of one (1) train each at 200 gpm which contains the following components:

- PLC with touchscreen HMI
- Feed pump
- Bag filter housing and filters
- Antiscalant metering pump and day tank
- Dechlorination metering pump and day tank
- High-Pressure RO Pump
- High-Pressure Concentrate Pump
- RO Pressure Vessels and Membranes
- VFDs for RO Pump and Concentrate Pump
- Instrumentation
- Powder-coated steel frame

The Clean-In-Place (CIP) subsystem will consist of the following components:

- Solution tank
- Circulating pump
- Motor starter
- Filter housing w/filter
- Instrumentation
- Immersion Heater
- Powder-coated steel frame

***Note: This proposal assumes that any pretreatment and post-treatment/disinfection where deemed necessary will be provided by the City of Fort Bragg.**

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If the concentrations of iron and manganese are higher than reported, Aqua Clear offers the Option of a Media Filter Skid with following components:

- Media Filters with iron removal media
- Control valves
- Pre-plumbed
- Powder-coated steel frame

2.2. Raw Water Quality

From *Alpha Analytical Laboratories report dated 12/02/15*, the data below represents the influent to the RO system. In addition, the City of Fort Bragg stated on June 4, 2021 that turbidity is reported as <1 NTU and the suspended solids as <1 ppm TSS.

Note: The concentration of silica has not been provided.

The total organic carbon is assumed to be <3 ppm TOC.



Alpha Analytical Laboratories Inc.

e-mail: clientservices@alpha-labs.com

Corporate: 208 Mason St., Ukiah, CA 95482 • Phone: (707) 468-0401 • Fax: (707) 468-5267

Bay Area: 6398 Dougherty Rd., Suite 35, Dublin, CA 94568 • Phone: (925) 828-6226 • Fax: (925) 828-6309

Central Valley: 9090 Union Park Way, Suite 113, Elk Grove, CA 95624 • Phone: (916) 686-5190 • Fax: (916) 686-5192

Sample Name: Noyo
Laboratory ID: 15K1890-02

Report Date: 12/02/15 13:40
Laboratory Code: 1610

System Name: FORT BRAGG, CITY OF
Source Name: 2310001-002 NOYO RIVER PUMP STATION
Sampled by: Heath Daniels
Employed by: City of Fort Bragg

Sample Date: 11/18/15 08:03
Sample Received: 11/18/15 13:18
User ID: RXR
System Number: 2310001

Data submitted to DDW via EDT

Inorganic Chemicals

Parameter	Result	MCL	DLR	Units	Storet	Test Method
Iron	130	300	100	ug/L	01045	EPA 200.8
Manganese	<20	50	20	ug/L	01055	EPA 200.8
Nickel	<10	100	10	ug/L	01067	EPA 200.6
Selenium	<5.0	50	5.0	ug/L	01147	EPA 200.8
Silver	<10	100	10	ug/L	01077	EPA 200.8
Thallium	<1.0	2	1.0	ug/L	01059	EPA 200.8
Zinc	<50	5000	50	ug/L	01092	EPA 200.8
Mercury	<1.0	2	1.0	ug/L	71900	EPA 245.1

Inorganic: Additional Analyses

Parameter	Result	MCL	DLR	Units	Storet	Test Method
Aggressive Index	11.12			NU	82383	AWWA
Nitrite as N	<0.40	10	0.40	mg/L	00620	EPA 300.0
Perchlorate	<4.0	6	4.0	ug/L	A-031	EPA 314.0

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Sample Name: Noyo
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 User ID: RXR
 System Number: 2310001

Data submitted to DDW via EDT

General Mineral and Physical

Parameter	Result	MCL	DLR	Units	Storet	Test Method
Odor	<1.0	3	1	T.O.N.	00086	EPA 140.1
Calcium	17			mg/L	00916	EPA 200.7
Magnesium	5.8			mg/L	00927	EPA 200.7
Sodium	11			mg/L	00929	EPA 200.7
Nitrate as NO3	<2.0	45	2.0	mg/L	71850	EPA 300.0
Sulfate as SO4	5.7	*	0.5	mg/L	00945	EPA 300.0
Fluoride	0.12	2	0.10	mg/L	00951	EPA 300.0
Chloride	9.9	*		mg/L	00940	EPA 300.0
Color	13	15		CU	00081	SM2120B
Turbidity	0.39	5		NTU	82079	SM2130B
Hydroxide	<5.0			mg/L	71830	SM2320B
Carbonate	<5.0			mg/L	00445	SM2320B
Bicarbonate	94			mg/L	00440	SM2320B
Total Alkalinity as CaCO3	77			mg/L	00410	SM2320B
Hardness, Total	66			mg/L	00900	SM2340B
Specific Conductance (EC)	180	*		umhos/cm	00095	SM2510B
Total Dissolved Solids	120	*		mg/L	70300	SM2540C
pH	7.60			pH Units	00403	SM4500-H+ B
MBAS, calculated as LAS, mw 340	<0.050	0.5		mg/L	38260	SM5540C

Inorganic Chemicals

Parameter	Result	MCL	DLR	Units	Storet	Test Method
Aluminum	210	1000	50	ug/L	01105	EPA 200.8
Antimony	<6.0	6	6.0	ug/L	01097	EPA 200.8
Arsenic	<2.0	10	2.0	ug/L	01002	EPA 200.8
Barium	<100	1000	100	ug/L	01007	EPA 200.8
Beryllium	<1.0	4	1.0	ug/L	01012	EPA 200.8
Cadmium	<1.0	5	1.0	ug/L	01027	EPA 200.8
Chromium	<10	50	10	ug/L	01034	EPA 200.8
Copper	<50	1000	50	ug/L	01042	EPA 200.8

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

2.3. Required Product Water Specifications

Product TDS < 500 mg/L

The product TDS of the water produced determined by Toray projections for TMG20D-400 and TM720D-400 membranes.

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2.4. Utility Connections and Operating Environment

The environment in which the water plant will operate is assumed to be described as:

- Non-Hazardous Electrical Area Classification
- Temperature: 35 – 140°F, during normal operation
- Relative Humidity: 5 - 95% (non-condensing)

For this proposal the available site utilities are assumed to include:

- Electrical Supply: 460V/60Hz/3Ph
- **Feed Water: 5-ft Suction lift required**
- Drain: atmospheric

This proposal is also based on the following documents received:

Document Number	Title	Revision
Alpha Analytical Lab	Noyo River Pump Station Analytical Report	12/02/15
Email	Email communication btw Fort Bragg and Ryan Process	06/04/21
Phone btw Fort Bragg and Ryan Process	Feed pump required with suction lift of 5 ft	06/09/21

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3 Equipment Description

Based on the scope of the project defined in Section 2, below is a general description of the equipment and components that comprise the AC-6680 RO system and the clean-in-place (CIP) system. Specific technical data follows.

3.0. System Description

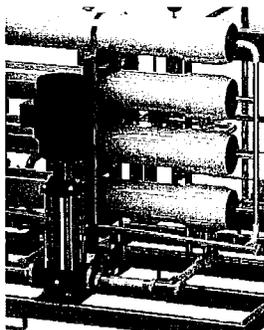
Aqua Clear's RO systems are designed to produce purified water. Aqua Clear's RO systems incorporate energy saving measures such as low-pressure RO membranes and VFD control of pump motors.

The RO unit includes reverse osmosis (RO) membranes to filter dissolved solids. This skid-mounted, package system is pre-plumbed and pre-wired on a powder-coated frame complete with a PLC and touchscreen HMI, variable frequency drives, instrumentation and preprogrammed automatic operation allowing for straightforward system monitoring and control.

3.1 Reverse Osmosis System

3.1.1 RO Process Description

The reverse osmosis process removes greater than 99% of the dissolved solids (TDS) from the feed water. This is accomplished by applying pressure across semi-permeable membranes which allow water to pass across the membrane (permeate) and concentrating the solids into a waste stream (concentrate). As the quantity of permeate water recovered from feed water is increased, the concentrate of solids in the waste stream proportionally increases.



The RO skid is comprised of these primary components:

- Pre-Filter housing
- High Pressure Pumps
- Membrane pressure vessels with RO membranes

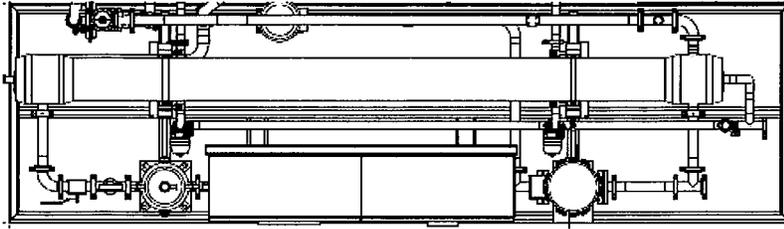
The upstream filter housing contains bags filters that protect the pump and RO membranes by removing suspended solids that may have carried over in the feed water.

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The RO system is inherently a modular design with the “building blocks” being the membrane elements. In order to calculate the number of membrane elements required for

the project, the desired permeate production rate is divided by the appropriate average system flux rate and the membrane surface area of the selected element. Flux is defined as the permeate production divided by total active membrane area and is measured as GFD (Gallons per Square Foot Membrane Area per Day). **Given the use of ground water, a flux rate within the range of 14 through 18 GFD is appropriate for this application.**

RO recovery is defined as the percentage of permeate water produced from the feed flow. Recovery is limited by factors such as solubility of the salts in the concentrate stream (scaling) and flow across the membrane surface (crossflow). Operating at higher recovery rates increases the TDS within the RO permeate stream. **The RO system optimally operates within the range of 75 to 80% recovery.**

RO recovery is maintained through proportional control using an actuated valve with positioner on the concentrate stream.

The system includes a concentrate recovery stage which increases the concentration by pumping the brine stream thru an additional vessel of membranes at a higher pressure to further recover more permeate and reduce the brine discharge to sewer by 50%

When the RO system is not in service, a flush sequence is initiated using RO permeate.

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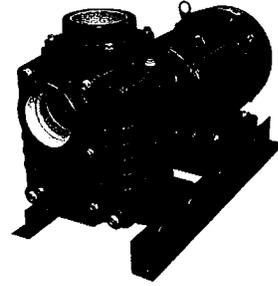
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3.1.2 RO System Components

3.1.2.1 Feed Pump

- Self-Priming centrifugal design
- Cast Iron Construction with Stainless Steel Impeller
- 250 gpm @ 5-ft suction lift & 25 psi discharge
- AMT (Gorman-Rupp brand)



3.1.2.2 Motor

- TEFC
- 7.5 HP
- 460V/3-phase/60hz

3.1.2.3 Filter Housing

- 304SS
- #2 Bag Filters
- Shelco or equivalent



3.1.2.4 High-Pressure Booster Pumps (2)

- Vertical multi-stage centrifugal design
- 316SS
- 250 gpm @ 225 psi
- 60 gpm @ 200 psi (for concentrate recovery)
- Grundfos



3.1.2.5 Motors (2)

- High Efficiency
- TEFC
- 50 HP
- 15 HP (for concentrate recovery)
- 480V/3-phase/60hz
- Panel-mounted VFD

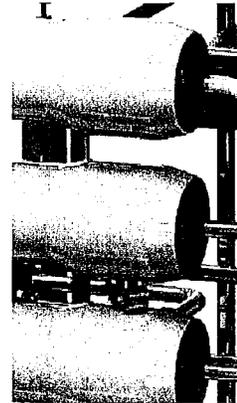
3.1.2.6 Reverse Osmosis Membranes (42)

- Spiral wound thin-film composite
- 8" diameter x 40" length
- 400 ft² membrane surface area
- 34-mil spacer
- Toray TMG20D-400
- Toray TM720D-400 (for concentrate recovery)



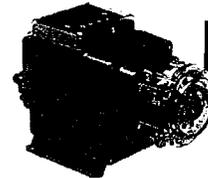
3.1.2.7 Reverse Osmosis Pressure Vessels (7)

- Fiberglass reinforced (FRP) pressure vessels
- 8" Diameter
- Protec
- 6 membrane elements per vessel
- Pressure: 300 psi max
- Pressure: 450 psi max (for concentrate recovery)



3.1.2.8 Chemical Injection Pumps and Day Tanks (2)

- Anti-scalant Injection
- Dechlorination Injection
- 110V
- Day Tank
- Low-level Switch



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3.2 System Control Center

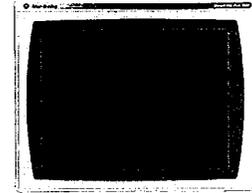
3.2.1 Programmable Logic Computer

- Allen Bradley MicroLogix
- Automatic startup sequence and operation
- Automated permeate flush during non-demand periods
- Safe system shutdown when alarm conditions are exceeded
- Pretreatment and post distribution system interlocks



3.2.2 Human Machine Interface

- Allen Bradley Touchscreen
- Graphic display of monitoring points
- User-defined setpoints
- Alarm History
- USB port for datalogging history



3.2.3 Variable Frequency Drive (2)

- Panel-mounted VFD for High Pressure Pump
- 50 HP
- 15 HP (for concentrate recovery)
- 460V



3.2.4 Control Panel

- UL 508 listed
- NEMA 4 Rated enclosure

3.3 Instrumentation

3.3.1 Pressure (8)

- 316L SS
- Glycerin-filled
- 0 to 300 psi display
- Transmitter



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3.3.2 Flow (3)

- Paddlewheel-type flow sensors
- Transmitter
- GF Signet



3.3.3 Conductivity/Temperature

- Conductivity sensors (3)
- Temperature sensors (1)
- GF Signet



3.4 Mechanical

3.4.1 Frame

- RO system described herein will be affixed to and mounted on structural skids.
- Powder-coated steel frame

3.4.2 Piping and Valves

- Sch 80 PVC
- Sch 10 SS on high pressure lines

3.5 Electrical

- 460 V/3 Phase/60 Hz
- Single disconnect

3.6 Clean-In-Place System

The Clean-In-Place system (CIP) will be mounted on the RO skid. It includes a tank for manual preparation of the membrane cleaning solutions, an immersion heater within the tank to heat the solution up to 45°C, a pump to circulate the solution through the membranes at low pressure, and a cartridge filter to remove dislodged particulates.

3.6.1 CIP Components

- 200-gpm pump - Stainless Steel Wetted-End Construction TEFC Motor
- Pump Motor Starter

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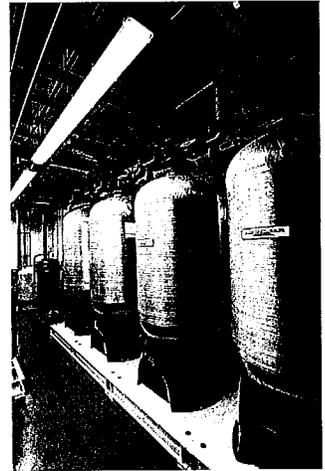
- 300-gallon Polyethylene Solution Tank
- Cartridge Prefilter Housing
- Spun-Wound Polypropylene Filter Cartridges
- Instrumentation includes Pressure Gauge, pH sensor and Thermometer
- Pre-Wired Immersion Heater

3.7 Media Filter System (Priced Option)

The Media Filter System designed for 240 gpm will be mounted on a separate skid. It includes tanks filled with granular water filtration media used for the removal of hydrogen sulfide, iron and manganese. particulates. Each bed will have a control valve head interlocked to accommodate backwash phase.

3.7.1 Media Filter Components

- Two (2) 48" x 72" Pentair composite fiberglass vessels
- Two (2) Clack WS3 Control valve configuration
- 40.0 FT3 Pyrolox 20x40 mesh media per vessel
- Control valves pre-plumbed for basic installation onsite
- Instrumentation includes Pressure Gauges
- Mounted on powder coated steel frame
- Oxidant metering pump and day tank (when needed)



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4 Documentation

Respective documentation for each of the new equipment will also be provided.

4.1 Documentation provided

- Operation and maintenance manuals
- Component catalog cut sheets
- As built general arrangement drawings
- As built process and instrumentation diagrams
- As built electrical drawings and wiring diagrams

4.2 O&M Manuals (2 USBs)

Aqua Clear's Instruction/Operation/Maintenance Manual covers the multitude of facets to operation of a water treatment unit. The manual includes topics such as:

- Description of the modes of operation
- Detailed overview of the HMI of the system and how to confidently navigate the wealth of information
- Installation and start-up guidelines
- Step-by-step instructions on all operations of the water treatment system
- Troubleshooting of common problems
- Typical maintenance required by the system
- Data recording instructions
- Chemical mixing instructions
- Safety procedures
- Relevant system drawings for reference throughout the manual

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5 Technical Services (Priced Option)

5.1 Commissioning Plan, Service & Support Packages

Prior to commencement of commissioning of the system, Aqua Clear will prepare and provide a customized commissioning and start-up plan.

Commissioning will be carried out by Aqua Clear's qualified and experienced personnel, and will include, but may not be limited to the following:

- Assist in loading cartridge filter and membranes
- Check and calibrate all meters, probes, analyzers
- Mechanical check:
 - Confirm that piping terminations have been completed
 - Tanks cleaned (no debris inside)
 - Adjust timing for auto valves, ensure smooth operation
- Electrical check:
 - Check rotation of pumps
 - Verify feed power
 - Verify all I/O with off skid equipment
 - Verify VFD programming
- Chemical feed system verification
 - Dosage
 - Fill tanks
- Manual operation
- Automatic operation
 - Verify correct set points
 - Tune PID loops
 - Test all modes of operation
 - Verify correct control of equipment by others
 - Verify system performs to design parameters
- Participate in Site Testing
- Operator training

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5.2 Start-Up Training

Perhaps the most significant training the operators will receive is the hands-on training provided at the time of start-up and commissioning. Aqua Clear personnel strive to include operators in the start-up and commissioning process, as it provides a terrific opportunity for the plant personnel to become familiar with the new processes and equipment supplied.

Activities that are reviewed during start-up include:

- Filter and membrane loading
- Review of parameters used to control equipment
- HMI operation
- Explanation of data logging procedures and value of collected data
- Importance of chemical dosing and how to measure rates and flows
- Operation of individual pieces of equipment such as analyzers and chemical feed pumps
- Calibration procedures for equipment that need regular monitoring
- Discussion of sampling procedure and recommended frequency

5.3 Technical Exclusions

The following is not included in our proposal. Some items will need to be provided by others:
• Floor drain
• Electrical supply
• Containment unit for chemicals.
• Safe storage of equipment at site until ready for installation
• Civil works.
• Equipment access platforms, walkways, stairs etc. unless otherwise specified
• Electrical wiring interconnections (including wiring, conduit and other appurtenances) to and between Aqua Clear supplied skids/equipment
• Equipment anchor bolts.
• Raw materials, chemicals, and other consumables required for normal operation.
• Bulk chemical storage facilities including chemical totes.
• All required permits.

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6 Commercial

6.1 Price Summary

- 1) Reverse Osmosis Skid \$298,800.00
- 2) Media Filtration Skid (Option) ~~\$78,100.00~~
- 3) Commissioning Oversight & Training (Option) \$1800/day + travel expenses

tax \$26,518.50
 \$325,318.50
 + 6,000.00
 ship \$1,500
 \$335,818.50

6.2 Standard Exceptions and Clarifications

- 1) The above prices do not include taxes, VAT
- 2) The above prices do not include duties or other government fees
- 3) Shipping & Crating cost not included

6.3 Commercial Terms and Conditions

Validity	Proposal valid for 30-days
Shipping / Delivery	Delivered to Fort Bragg, CA (Cost to be determined) Manufacturing time is 10-12 weeks after receipt of approved drawings/documents. Delays in drawing/document approval will result in a day-for-day adjustment to ship date via customer change order.
Payment Terms	50% down payment, due upon PO 50% prior to shipment
Warranty	Aqua Clear's standard warranty is 18 months from shipment date or 12 months from installation, whichever occurs first. This stated warranty period will supersede any and all other implied warranty period(s) stated in the proposal package.
Cancellation Policy	See terms and conditions.

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General Terms & Conditions

All terms and conditions of sale are negotiable at the time of order. Aqua Clear standard terms and conditions of sale have been attached in the Commercial Proposal for review.

7 Supporting documents

1. Aqua Clear General Terms and Conditions
 - a. Sales
 - b. Service

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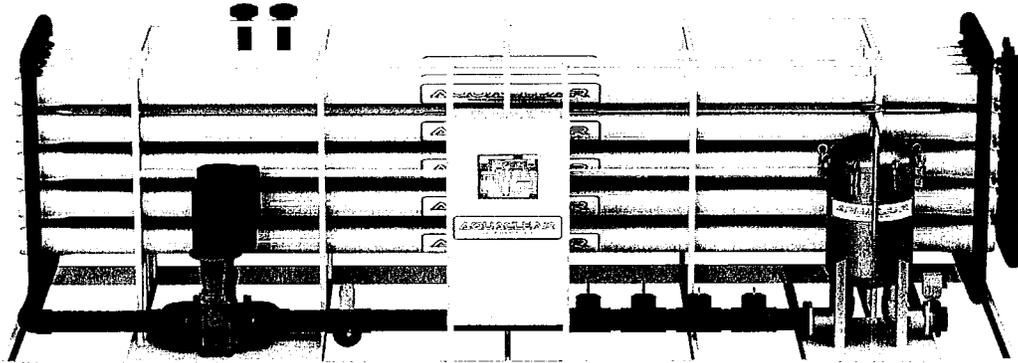
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Industrial Reverse Osmosis Systems



700 GPM Industrial Reverse Osmosis System w/SCADA PLC

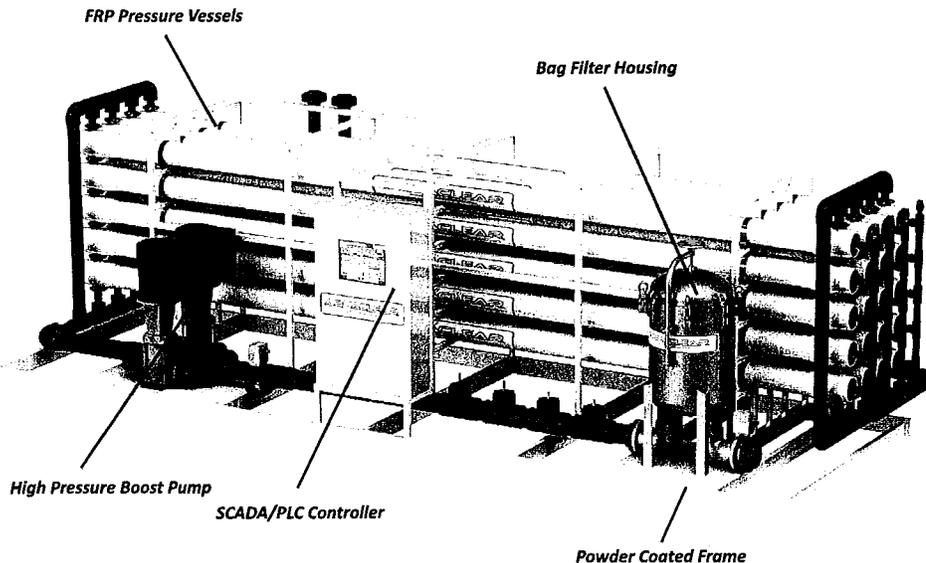
Aqua Clear Water Treatment Specialists manufacturers and engineers 250-1000 gpm customized industrial reverse osmosis systems to accommodate many different water conditions. Like each water type, each reverse osmosis system is unique and fully customizable for our customers specific application. When working with any customer we listen closely to the needs and expectations, then implement this in the design process for ease of use and maintenance. Each reverse osmosis system comes fully complete with all wiring and plumbing making it a turn-key system. Simple plumbing connections and wiring is all that is needed.

Features (standard)

- Easy access points of connections
- Interconnecting piping and wiring
- Full electrical package
- 460V/3ph/60Hz power supply
- Plumbing and wiring mount/support
- Easy access control panel
- 3D/2D CAD drawings/O&M manual
- PLC controller
- Digital flow readouts
- Digital pressure readouts
- Permeate/feed conductivity monitor

Features (optional)

- Clean-in-place skid (CIP)
- 380-415V/3ph/50Hz power supply
- Chemical dosing systems
- Divert valves
- Permeate flush with valves
- PH/ORP monitoring
- SCADA with remote monitoring
- Ultraviolet Sterilizer



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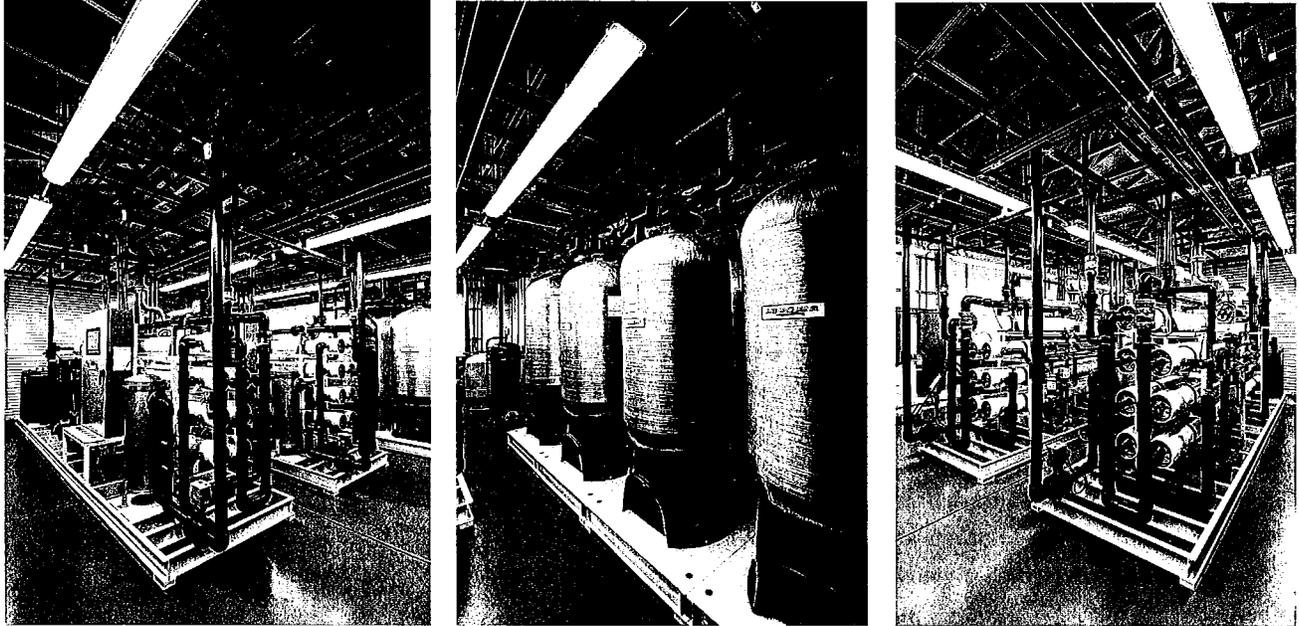
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water treatment specialists

Industrial Reverse Osmosis Systems

▷ Engineering ▷ Manufacturing ▷ Installation ▷ Startup/Training ▷ Service

Custom Engineered RO Plant Layouts



Benefits

When compared with other conventional water treatment processes, reverse osmosis has proven to be the most efficient means of removing salts, chemical contaminants and heavy metals, such as lead, from drinking water. Typically waters with total dissolved solids of 200 or more, reverse osmosis is less expensive than ion exchange. Compared with distillation, reverse osmosis use only a fraction of the total energy and does not have high temperature problems or scaling and corrosion. Today reverse osmosis systems have proven to be the most economical and efficient means of improving the quality of water.

Operation Specifications:

- ▷ Max. feed water temperature: 40°C/104°F
- ▷ Min. Feed water pressure: 30 psi
- ▷ Operating pressure: 120 to 150 psi
- ▷ Max. SDI (Silt Density Index): <3.0
- ▷ Max. feed chlorine : 0 ppm
- ▷ Turbidity < 50 max. 300 NTU
- ▷ Nominal system overall recovery rate 75%-80%
- ▷ Nominal system TDS reduction: 95%-99%

Aqua Clear Water Treatment Specialists also supplies: Multimedia Pretreatment, Activated Carbon Pretreatment, Water Conditioning, Chemical Dosing Systems, Ultraviolet (UV) Sterilizers and Ozonation Systems.

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From: [Gabriel Maroney](#)
To: [Lemos, June](#); [Norvell, Bernie](#); [Morsell-Haye, Jessica](#); [Miller, Tabatha](#); [Peters, Lindy](#); [Albin-Smith, Tess](#)
Subject: 1A special Meeting.
Date: Monday, June 21, 2021 3:32:52 PM

Please look into the costs and logistics of weather modification as due diligence on increasing water resource.

There is also some evidence that this technology pulls water from one region and puts it on another, hence exacerbating a drought in some areas, yet replenishing another.

<https://now.northropgrumman.com/making-rain-science-weather-manipulation/>

<https://www.bloomberg.com/features/2015-cloud-seeding-india/>

<https://www.smithsonianmag.com/smart-news/cloud-seeding-study-suggests-we-could-boost-rain-and-snow-15-percent-180953784/>

Sent from my iPhone