



COMMONWEALTH OF VIRGINIA
STANDARD CONTRACT

Contract No. UCPJMU6794

This contract entered into this 11th day of December 2023, by Water Chemistry, Inc., hereinafter called the "Contractor" and Commonwealth of Virginia, James Madison University called the "Purchasing Agency".

WITNESSETH that the Contractor and the Purchasing Agency, in consideration of the mutual covenants, promises and agreements herein contained, agree as follows:

SCOPE OF CONTRACT: The Contractor shall provide the services to the Purchasing Agency as set forth in the Contract Documents.

PERIOD OF PERFORMANCE: From January 3, 2024 through January 2, 2025 with 9 one-year renewal options.

The contract documents shall consist of:

- (1) This signed form;
(2) The following portions of the Request for Proposal MPM-1195 dated September 25, 2023:
(a) The Statement of Needs,
(b) The General Terms and Conditions,
(c) The Special Terms and Conditions together with any negotiated modifications of those Special Conditions;
(d) Addendum No. One - September 25, 2023
(e) Addendum No. Two - September 25, 2023
(3) The Contractor's Proposal dated October 25, 2023 and the following negotiated modification to the Proposal, all of which documents are incorporated herein.
(a) Negotiations Summary, dated December 4, 2023.

IN WITNESS WHEREOF, the parties have caused this Contract to be duly executed intending to be bound thereby.

CONTRACTOR:
By: [Signature]
(F. Scott Russow)
(Printed Name)
Title: Regional Manager

PURCHASING AGENCY:
By: [Signature]
(Michael Morrison)
(Printed Name)
Title: Buyer Senior

NEGOTIATION SUMMARY

WATER CHEMISTRY

RFP# MPM-1195 WATER TREATMENT & SERVICES FOR COOLING TOWERS, BOILERS & RELATED EQUIPMENT

12/4/2023

The Primary Point of Contact for this Contract is:

F. Scott Russow
1-540-343-3618
scott.russow@waterchemistry.com

PRICING SCHEDULE:

The following Labor, Other Fees, and Discounts sections represent the negotiated pricing for all represented items and should be reflected in all quotes and proposals for the University. No other fees or charges shall be acceptable.

Annual Pricing for Testing, Routine Service, Test Kits and Chemicals	
Ninety Eight (98) closed loops with water	\$1500.00
Twenty Two (22) closed loops with propylene glycol	\$1500.00
Twenty Four (24) cooling towers with a total capacity of 8,108 tons and 31 cooling tower cells	\$18000.00
Monthly review and recommendations of Twenty Four (24) cooling towers and all 31 cooling tower cells	\$12000.00
Perform facility legionella plan testing on 24 cooling towers with quarterly provision of 24 – 5 gallon containers of >12% active sodium hypochlorite and 24 legionella culture CDC Elite certified tests per year	\$15300.00
Price to perform one set of HPC and CDC Elite Certified Legionella	\$250.00

Annual Pricing for Testing, Routine Service, Test Kits and Chemicals	
Monthly review and recommendations of five (5) HP Steam Boilers	\$12000.00
Monthly review and recommendations of six (6) condensate return systems	\$3600.00
Monthly review and recommendations for three (3) DA Feedwater Systems	\$1200.00
Monthly review and recommendations of four (4) water softeners	\$600.00
Monthly review and recommendations of four (4) condensers	\$15300.00
Monthly review and recommendations of one (1) centralizer chiller water system	\$300.00
Quarterly review and recommendations of ten (10) closed loop heating water systems	\$0.00
Quarterly review and recommendations of one (1) RODI system used for humidification in CISAT A3	\$0.00

Products & Equipment	
	% Off List Discount Offered by Zone
Replacement parts and/or components	15%
New water systems and HVAC related equipment	15%

PRICING SCHEDULE BY ZONE									
Regular Time Labor Rates (7:30 AM – 4:00 PM Monday – Friday)*									
Service	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9
Service Technician/Tradesman Labor Rate \$/hour	\$95.00	\$95.00	\$95.00	\$95.00	\$95.00	\$95.00	\$95.00	\$95.00	\$95.00
Engineer/Scientist Labor Rate \$/hour	\$175.00	\$175.00	\$175.00	\$175.00	\$175.00	\$175.00	\$175.00	\$175.00	\$175.00
Overtime/Emergency Labor Rates (Outside of Regular Time working hours)									
Service Technician/Tradesman Labor Rate \$/hour	\$95.00	\$95.00	\$95.00	\$95.00	\$95.00	\$95.00	\$95.00	\$95.00	\$95.00
Engineer/Scientist Labor Rate \$/hour	\$175.00	\$175.00	\$175.00	\$175.00	\$175.00	\$175.00	\$175.00	\$175.00	\$175.00

Other Fees	
Charge Card Processing Fees:	0 %
Any extra travel will meet GSA standards.	

1. Any change in the scope described herein shall be mutually agreed upon by the Purchasing Agency and Contractor with all changes first being authorized through either a contract modification and/or a change order issued by the Purchasing Agency.
2. Parties agree that this Negotiation Summary modifies RFP# MPM-1195 and the Contractor’s initial response to RFP# MPM-1195, and in the event of conflict this negotiation summary shall take precedence.
3. Contractor agrees that all exceptions taken within their initial response to RFP# MPM-1195 that are not specifically addressed within this negotiation summary are null and void.



ORIGINAL

**Water Treatment & Services for
Cooling Towers, Boilers & Related Equipment
RFP # MPM-1195**

**A Proposal for Water Treatment Services for
James Madison University**

SUBMITTED TO

**Commonwealth of Virginia
James Madison University
Procurement Services MSC 5720
752 Ott Street, Wine Price Building
First Floor, Suite 1023
Harrisonburg, VA 22807**

**Michael Morrison, Buyer Senior
Procurement Services
Phone: 540-568-6181; Fax: 540-568-7935
Email: morrismp@jmu.edu
Due: October 25th, 2023 at 2:00 PM**

BY

**Water Chemistry, Inc.
3404 Aerial Way Drive
Roanoke, VA 24018
Phone: (540) 343-3618, Fax: (540) 342-2054
F. Scott Russow, Regional Manager
Email: scott.russow@waterchemistry.com**



Comprehensive Water Treatment Program Table of Contents

Part 1	Executive Summary
Part 2	RFP Cover Sheet and Addenda
Part 3	Plan and Methodology for Section IV Statement of Needs
Part 4	Written Narrative
Part 5	Offer Data Sheet and Small Business Plan (Attachments A and B)
Part 6	VASCUPP Member Institution Sales
Part 7	Section 10 Pricing Schedule, Including Addendum 2
Part 8	Product Data and Tower Treatment SDS

PART 1



October 25, 2023

Commonwealth of Virginia
James Madison University
Procurement Services MSC 5720
752 Ott Street, Wine Price Building
First Floor, Suite 1023
Harrisonburg, VA 22807

Attn: Michael Morrison, Buyer Senior Procurement Services
540-568-6181; Fax: 540-568-7935
Email: morrismp@jmu.edu

RE: Executive Summary

Dear Mr. Morrison:

Following this document, we have our proposal package for your consideration.

Included in this proposal is our technical approach to water treatment to meet and exceed the specifications set in your scope of work and addendums. We have also included a statement of qualifications with staff experience, discussion of value added services, a workforce management plan with key individuals, and a program implementation plan.

We also discuss safety, system training and water treatment operation, and include references for review. Following this is our pricing schedule.

We look forward to this opportunity to extend our working relationship for an additional contract period and stand ready, willing and able to assist you in all your water treatment related needs. I am available with a 24-hour number of (703) 328-1671 and through email at scott.russow@waterchemistry.com.

Sincerely,

F. Scott Russow

F. Scott Russow
Regional Manager

Chemicals, Technology, Service, and Equipment for Industrial Water Conditioning

3404 Aerial Way Drive • Roanoke, VA 24018 • Phone (540) 343-3618 • Fax (540) 342-2054

PART 2

REQUEST FOR PROPOSAL
RFP# MPM-1195

Issue Date: September 25, 2023
Title: Water Treatment & Services for Cooling Towers, Boilers, and Related Equipment
Issuing Agency: Commonwealth of Virginia
James Madison University
Procurement Services MSC 5720
752 Ott Street, Wine Price Building
First Floor, Suite 1023
Harrisonburg, VA 22807

Period of Contract: From Date of Award Through One Year (Renewable)

Sealed Proposals Will Be Received Until 2:00 PM on October 25, 2023 for Furnishing The Services Described Herein.

MANDATORY/ OPTIONAL PRE-PROPOSAL: None

SEALED PROPOSALS MAY BE MAILED, EXPRESS MAILED, OR HAND DELIVERED DIRECTLY TO THE ISSUING AGENCY SHOWN ABOVE.

All Inquiries For Information And Clarification Should Be Directed To: Michael Morrison, Buyer Senior, Procurement Services, morrismp@jmu.edu; 540-568-6181; (Fax) 540-568-7935 not later than five business days before the proposal closing date.

NOTE: THE SIGNED PROPOSAL AND ALL ATTACHMENTS SHALL BE RETURNED.

In compliance with this Request for Proposal and to all the conditions imposed herein, the undersigned offers and agrees to furnish the goods/services in accordance with the attached signed proposal or as mutually agreed upon by subsequent negotiation.

Name and Address of Firm:

Water Chemistry, Inc.

3404 Aerial Way Drive

Roanoke, VA 24018

Date: October 25, 2023

Web Address: www.waterchemistry.com

Email: scott.russow@waterchemistry.com

By: 
(Signature in Ink)

Name: F. Scott Russow
(Please Print)

Title: Regional Manager

Phone: 540-343-3618

Fax #: 540-342-2054

ACKNOWLEDGE RECEIPT OF ADDENDUM: #1 GR #2 GR #3 _____ #4 _____ #5 _____ (please initial)

SMALL, WOMAN OR MINORITY OWNED BUSINESS:

YES; NO; *IF YES* ⇒⇒ SMALL WOMAN; MINORITY *IF MINORITY*: AA; HA; AsA; NW; Micro

Note: This public body does not discriminate against faith-based organizations in accordance with the Code of Virginia, § 2.2-4343.1 or against an offeror because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment.

ADDENDUM NO.: ONE (1)
TO ALL OFFERORS:

REFERENCE: Request for Proposal No: **RFP# MPM-1195**
Dated: **September 25, 2023**
RFP Closing On: **October 25, 2023 at 2:00 p.m. (Eastern)**

Please note the clarifications and/or changes made on this proposal program:

1. Do you use Sodium Nitrate or Molybdenum in the non-Glycol closed loops?
 - a. **Sodium Nitrate.**
2. Please provide Pricing Schedule information about the boilers to be serviced.
 - a. **Five (5) High Pressure Steam Boilers. Total steam generation capacity 270,000 lbs. per hour.**
3. Are the cooling tower controllers linked into a network system?
 - a. **No.**
4. Are all the systems on city water or are some on well water?
 - a. **City water.**
5. Does JMU own all equipment (chemical feed systems and containment tanks)?
 - a. **Yes.**
6. Who is doing the cooling tower cleaning? Annually?
 - a. **Performed in-house by Trades Technicians.**
7. What are the operating conditions of the cooling towers?
 - a. **Incoming Water Quality: total hardness = 60 ppm, total alkalinity = 60/pH =7.2, Conductivity = 125, Cycles = 4, Tonnage: 7520 & 8800 tons, MU Flow: varies 0-200 GPM, Blowdown flow and discharge = No data available; blowdown rate is set to maintain 650 conductivity, Manufacturer Serial Number = No available, Operating time = 24/7/365**
8. Is there any Legionella testing done on the cooling towers?
 - a. **Yes, annually.**
9. What are the operating conditions for the Boilers-
 - a. **Incoming Water Quality = Total Hardness = 60 PPM, Total Alkalinity = 60, pH = 7.2, Conductivity = 125, Cycles = N/A, HP = Total – 7,917 HP, Steam production (lbs/hr) = 270,000 Blowdown rate = 3% , Pretreatment and blowdown discharge = Water Softeners.**
10. Closed loop sizes?
 - a. **No data available.**

11. Estimated water loss from leaks?
 - a. Less than 5%.
12. What is the percentage of glycol required?
 - a. 30 – 35%
13. What are your water, sewer, and boiler fuel rates (for ROI calculations)
 - a. Water and sewer together @ \$8.75 per k/gal.
 - b. Boiler fuel: NG - \$8.90 DTH; Diesel = \$5.50 per gallon.
14. Can you provide annual water data for the cooling and boiler systems or provide an average % load to base my calculations on?
 - a. ECPP consumes approximately 25 to 30 million gallons annually on cooling tower make-up, boiler water make-up consumes approximately 4 to 5 million gallons per year, this is an average of approximately 8 to 10% make-up rate.
15. What is the construction material for the cooling towers/condensers?
 - a. Varies campus wide (includes but is not limited to: stainless steel, galvanized steel, and PVC fill).
16. How many pounds of nitrate do you purchase annually?
 - a. Unknown, purchased as required.
17. How many pounds of molybdenum do you purchase annually?
 - a. Unknown, purchased as required.
18. Could you provide a current equipment list for the chemical control?
 - a. JMU owns all equipment for chemical control. List is too extensive to include here.
19. Are there any access restrictions to any Cooling Tower and/or Boiler systems?
 - a. Access is limited (per the RFP). All site visits require a JMU rep to be present.
20. Would a hands-free/drum-free deliver program be able to be utilized?
 - a. This would not be feasible in most locations.
21. Would JMU be interested in pursuing an alternative to heavy metal treatment?
 - a. If the treatment is aluminum-safe.
22. Can you please provide me with your discharge permits restrictions?
 - a. N/A.



23. Do you want to see price per pound for our products or just the total cost the way that you have it broken down in the RFP?
- a. **As much additional information as you can provide is always helpful. You are not required to submit this information but it would be valuable.**

Signify receipt of this addendum by initialing "*Addendum # 1*" on the signature page of your proposal.

Sincerely,

Michael Morrison

Michael Morrison
Buyer Senior
Phone: (540-568-6181)



October 19, 2023

**ADDENDUM NO.: TWO (2)
TO ALL OFFERORS:**

REFERENCE: Request for Proposal No: **RFP# MPM-1195**
Dated: **September 25, 2023**
RFP Closing On: **October 25, 2023 at 2:00 p.m. (Eastern)**

Please note the clarifications and/or changes made on this proposal program:

1. Can you provide the annual steam production?
 - a. Annual steam production ranges between 400 to 500 million pounds per year depending on outside temperatures.

2. Can you provide a Price Schedule addendum for the boiler services?
 - a. Please use the following table to price services for boilers.

Annual Pricing for Testing, Routine Service, Test Kits and Chemicals	
Monthly review and recommendations of five (5) HP Steam Boilers	\$
Monthly review and recommendations of six (6) condensate return systems	\$
Monthly review and recommendations for three (3) DA Feedwater Systems	\$
Monthly review and recommendations of four (4) water softeners	\$
Monthly review and recommendations of four (4) condensers	\$
Monthly review and recommendations of one (1) centralizer chiller water system	\$
Quarterly review and recommendations of ten (10) closed loop heating water systems	\$
Quarterly review and recommendations of one (1) RODI system used for humidification in CISAT A3	\$

Signify receipt of this addendum by initialing “Addendum # 2” on the signature page of your proposal.

Sincerely,

Michael Morrison

Michael Morrison
Buyer Senior
Phone: (540-568-6181)

PART 3



Products and Services Offered
As given in the RFP Page 7, Part V, Section B.2

All Water Chemistry, Inc. Products and Services shall meet or exceed the requirements as given in the RFP on Page 1, Part IV, Section A.1 Statement of Needs.

The most important product and service we can offer James Madison University is peace of mind. JMU must feel that the systems for which we are responsible will run smoothly, and that Water Chemistry, Inc. has the knowledge and experience to address any issues that arise, and to deal with those issues before they become problems.

Water Chemistry, Inc. offers this peace of mind. We have been in the water treatment industry for over 45 years; but our customers don't see our state-of-the-art water services. They see their condensers, boilers, and all related HVAC equipment operating efficiently with lower maintenance costs and down time. Our customers also know that when they hear about a problem with their water systems, it is usually *after* we have spotted it and addressed it, forestalled it or solved it.

Water Chemistry brings all those qualities to this program. The water treatment products to be used in this contract are industry proven over a period of many years and are considered industry standards. The equipment used to maintain efficient operation in the systems is effective in lab and facility operation. Water Chemistry is well versed in the various water tables found throughout the region and can create and operate a treatment program customized to the needs of JMU. We take special care to make certain all systems have proper oversight. The maintenance staff has so many responsibilities that the addition of reactive maintenance on water based systems impedes staff productivity and proves costly. This is where our services are best utilized.

Furthermore, when JMU works with Water Chemistry, Inc., it recognizes that we are the largest SWaM (Commonwealth of Virginia's designation as a certified small business) All Purpose Water Treatment Manufacturer and Service Provider in the Commonwealth of Virginia with rail service that includes custom chemical, pretreatment, and ultrapure water treatment services as well as access to VELAP Certified Laboratories. This unique distinction places us in a role that can specifically design and develop series of products and services directly for your location, to be used by your location, and give direct benefit to your location. This combined mission shall allow your systems to function well now and also in the decades to come.

For 45 years, Water Chemistry, Inc. has been an industry leader in various areas of institutional water treatment. We have Microbiologists, Chemists, Engineers, Physicists, and licensed tradesmen in numerous areas. As a team, we are able to make sure all the work we are doing meets or exceed industry standards.

It is our firm commitment to you that we will do everything possible to keep your staff educated on new trends in the industry as well as refreshed, through training, on the systems and practices in place. Training may be conducted on an annual basis or as needed or requested.

Water Chemistry, Inc. will work to assist your staff in resolving unforeseen issues which may arise and, most importantly, in preventing water related issues.



Water Chemistry also has the capability to generate electronic service reports. Information on paper is discreet and not easily related and it is difficult to associate one piece of data with another or to evaluate trends. However, each entry carries a wealth of insight about operational efficiency. Our electronic service reports convert raw data into useful information that can be used to:

- Detect trends before they become problems.
- Improve operational efficiency.
- Reduce downtime from equipment failure.
- Generate a wide range of management reports and graphs.

By utilizing this data in an easy to convert means, current and future operating efficiency can be maintained and equipment life span can be extended.

Water Chemistry, Inc. strives to provide products and services with best pricing practices to ensure Carilion receives the highest value for services rendered.

To perform this, we first and foremost offer JMU our best price. No other industry group or agency receives higher discounts. We maintain this by being a manufacturer. Water Chemistry has the unique opportunity to manufacture products designed directly for a particular customer. As a manufacturer, with available rail service to our central plant, we have the opportunity to procure items in bulk which minimizes raw costs. This benefit, combined with our materials strategic bidding process, allows Water Chemistry the opportunity to keep costs low while maintaining high quality products and services.

Furthermore, if at any time, JMU finds an exact product that we offer at a lower total cost from a reputable source, including shipping and handling, we shall match or beat that cost to guarantee best pricing practices.

Being a manufacturer of our products is a core feature that is becoming quite rare. Furthermore, as a manufacturer, we do not have to pay for the overhead and profit for other firms to perform our manufacturing.

When working directly with our customers, we also employ programs with advanced materials designed to minimize water and energy use while maintaining operating efficiency. When operating in this manner with a well-coordinated series of routine services, the customer can achieve lower operating costs aiding in facility operation.

Also when JMU works with Water Chemistry, Inc., they can rest assured knowing they are working with a firm that has multiple customers that covers whole University Campus's and Military Bases that have many cooling towers, steam boilers, and hundreds of closed systems.



We look forward to maintaining our cost saving measures as the largest SWaM All Purpose Water Treatment Manufacturer and Service Provider in the Commonwealth of Virginia. This includes water treatment services with access to Certified Labs that performs high purity analytical testing services. We look forward to passing these saving onto you, the customer, in the years to come.

Plan To Perform Services:

The first order of business for a water treatment professional in determining proper water HVAC (chillers, condensers, towers, evaporative condensers, humidifiers, closed loops) or Steam Boiler (low and high pressure) treatment program for a particular location is to first, understand the location. A water professional must be aware of all aspects of a water system, including the conditions it operated under, to be able to properly size, adjust, design and maintain a water treatment program. The factors to determine these issues can be typically covered by understanding the following:

I. HVAC Systems:

a) Equipment Location – Where the equipment is located is crucial to understanding the proper means of treating the systems. You need to be aware of the elevations, the distance of piping, is the equipment situated in a high airborne debris load zone, is it in full sun or shade, etc.

b) Materials of Construction – What is the system made of? Is it mild steel, galvanized, copper, pvc, stainless steel, bronze, brass, aluminum, or a combination thereof. Are the heat exchangers standard or super enhanced designed? The entire treatment program will have to be molded around the constituents.

c) Equipment Size – The tonnage/btu capacity will need to be known in order to properly size and implement a treatment program.

d) Period of Operation – The length of time a system runs directly effects the design of a treatment program. A system that runs 24/7 has to be handled differently than one that runs intermittently or only part of a year.

e) Frequency of Oversight – How often facility staff reviews the equipment has a direct effect on determining a treatment program. A program located in a central plant with 24 hour staffing is often handled differently than a location that is toured once a week by a maintenance worker.

f) Water Quality – One must know the contents of the makeup water and have an understanding of the variances of that water table over the operating seasons in order to properly set up a treatment program.

g) Pretreatment – Some locations have or may require pretreatment of the incoming water source in order to operate or maintain a treatment program.

h) Filtration – An operator needs to know if the systems reviewed have or need additional filtration to maintain operation.



Once these factors are known for a particular location, a water professional can then set up the water treatment program. This includes means of dosing, maintaining operating conditions, testing method and frequency, and service call schedule. Generally, once the system size, loads, duration of operation, ambient conditions, water quality, and general operating characteristics are known, the existing water treatment equipment, if present, is reviewed and determined if it is found to be sufficient for the particular tasks required. If the equipment is found not to be sufficient, then recommendations are made to improve the condition.

Generally, a chemically treated cooling tower system will need at a minimum an automated bleedoff controller with integral timers and three dosing pumps. The three pumps are generally used to dose an inhibitor and two alternate biocides. Commonly, the biocides are oxidizing and non-oxidizing. Otherwise, factory mounted treatment options (both electronic and chemical) are becoming commonplace and typically have all components needed to perform functional system treatment.

Closed loops are generally dosed via bypass feeders or with chemical metering pumps. Humidification equipment is typically handled with system pretreatment along with low dose inhibitor via a metering pump.

The set points and operating limits for the treatment program for these systems have to be determined by understanding the makeup quality and operating conditions of a system. By using stability indexes and utilizing software modeling, a water professional can predict the best means of inhibition for various treatment products and determine the maximum cycles allowed maintaining water conservation.

Once the initial program is designed, a frequency of testing and service schedule is recommended to allow program regulation. Often, basic testing is performed either daily or weekly by facility staff. More detailed testing is performed generally monthly by our staff. The testing commonly involves: Total Hardness, Calcium Hardness, Total Alkalinity, pH, Conductivity, pH, Inhibitor, and TDS. Other tests may need to be performed to properly maintain the systems, but they would have to be determined on a case by case basis.

II. Steam Boiler Systems:

a) Equipment Location – Where the equipment is located is crucial to understanding the proper means of treating the systems. You need to be aware of the elevations, the distance of piping and length of steam runs.

b) Materials of Construction – What is the system made of? Is it mild steel, galvanized, copper, stainless steel, bronze, brass, aluminum, or a combination thereof? The entire treatment program will have to be molded around the constituents.

c) Equipment Size – The boiler horsepower and steam output will need to be known in order to properly size and implement a treatment program.

d) Period of Operation – The length of time a system runs directly effects the design of a treatment program. A system that runs 24/7 has to be handled differently than one that runs intermittently or only part of a year.



- e) Frequency of Oversight – How often facility staff reviews the equipment has a direct effect on determining a treatment program. A program located in a central plant with 24 hour staffing is often handled differently than a location that is toured once a week by a maintenance worker.
- f) Water Quality – One must know the contents of the makeup water and have an understanding of the variances of that water table over the operating seasons in order to properly set up a treatment program.
- g) Pretreatment – Some locations have or may require additional pretreatment of the incoming water source in order to operate or maintain a treatment program.
- h) Filtration – An operator needs to know if the systems reviewed have or need additional filtration to maintain operation.
- i) Equipment Type – Is it a low or high pressure boiler system? Is the boiler a vertical unit, a cast iron sectional, a fire tube or water tube unit, and what are the tube configurations?

Once these factors are known for a particular location, a water professional can then set up the water treatment program. This includes means of dosing, maintaining operating conditions, testing method and frequency, and service call schedule. Generally, once the system size, loads, duration of operation, ambient conditions, water quality, and general operating characteristics are known, the existing water treatment equipment, if present, is reviewed and determined if it is found to be sufficient for the particular tasks required. If the equipment is found not to be sufficient, then recommendations are made to improve the condition.

Generally, most boilers in our region fall into two categories. The first would be small low pressure steam boilers spread throughout facilities; the second would be central plant high pressure steam boilers. The low pressure boilers typically have shorter condensate pipe runs than the larger central plant high pressure boilers. The treatment program has to be built around these factors. Typically dosing points for the low pressure boilers involve a metering pump and an interlocked or timed method device dosing the inhibitors into a feedwater vessel. Commonly, a single product is used in this application. However, there are times additional products and dosing locations are used to handle other problems as they arise.

High pressure boilers typically are dosed quite differently. The individual products are typically combined on site into dosing tanks and regulated into the feedwater, boiler drum, and often the steam header. Plant staff tends to modulate the dosages of the various treatment products based on routine testing.

All steam boilers must have a well coordinated plan to maintain proper blowdown. The blowdown is used to remove the excess system debris and dissolved solids to minimize system corrosion and deposition.

The set points and operating limits for the treatment program for these systems have to be determined by understanding the makeup quality and operating conditions of a system. By utilizing software modeling, a water professional can predict the best means of inhibition for various treatment products and determine the maximum cycles allowed maintaining water conservation.



Once the initial program is designed, a frequency of testing and service schedule is recommended to allow program regulation. Often, basic testing is performed either daily or weekly by facility staff. More detailed testing is performed generally monthly by our staff. The testing commonly involves: Total Hardness, Calcium Hardness, Phenol Alkalinity, Total Alkalinity, Hydrate Alkalinity pH, Conductivity, pH, Inhibitor, Sulfite, Silica, Iron and TDS. Other tests may need to be performed to properly maintain the systems, but they would have to be determined on a case by case basis.

III. RODI Systems:

a) Equipment Location – Where the equipment is located is crucial to understanding the proper means of treating the systems. You need to be aware of the elevations, the distance of piping, is the equipment situated in a high airborne debris load zone, is it in full sun or shade, etc.

b) Materials of Construction – What is the system made of? Is it mild steel, galvanized, copper, PVC, polypropylene, PVDF, stainless steel, bronze, brass, aluminum, or a combination thereof. Are the heat exchangers standard or super enhanced designed? The entire treatment program will have to be molded around the constituents.

c) Equipment Size – The system storage and reservoir capacity along with RO output will need to be known in order to properly size and implement a treatment program.

d) Period of Operation – The length of time a system runs directly effects the design of a treatment program. A system that runs 24/7 has to be handled differently than one that runs intermittently or only part of a year.

e) Frequency of Oversight – How often facility staff reviews the equipment has a direct effect on determining a treatment program. A program located in a central plant with 24 hour staffing is often handled differently than a location that is toured once a week by a maintenance worker.

f) Water Quality – One must know the contents of the rainwater and have an understanding of the variances over the operating seasons in order to properly set up a treatment program.

g) Pretreatment – Some RODI's have or may require pretreatment of the incoming water source in order to operate or maintain a treatment program.

h) Filtration – An operator needs to know if the systems reviewed have or need additional filtration to maintain operation.

Once these factors are known for a particular location, a water professional can then set up the water treatment program. This includes means of replacements if designed, maintaining operating conditions, testing method and frequency, and service call schedule. Generally, once the system size, loads, duration of operation, ambient conditions, water quality, and general operating characteristics are known, the existing water treatment equipment, if present, is reviewed and determined if it is found to be sufficient for the particular tasks required. If the equipment is found not to be sufficient, then recommendations are made to improve the condition.



The set points and operating limits for the treatment program for these systems have to be determined by understanding the water quality and operating conditions of a system. By using stability indexes and utilizing software modeling, a water professional can predict the best means of control for various treatment materials if required and determine the best means of water conservation.

Once the initial program is designed, a frequency of testing and service schedule is recommended to allow program regulation. Often, basic testing is performed either daily or weekly by facility staff. More detailed testing is performed generally monthly by our staff. The testing commonly involves: Total Hardness, pH, Conductivity, pH and TDS. Other tests may need to be performed to properly maintain the systems, but they would have to be determined on a case by case basis.

General Routine Treatment Services Performed for Facilities:

- a) Arriving on site and initiating work at a schedule that meets the needs of the particular facility
- b) Providing technical support including recommendations for maintenance and product support
- c) Performing routine inspections
- d) Testing of water samples for the required purity along with microbiological analysis.
- e) Performing maintenance and routine adjustments to treatment devices, including makeup water trending to anticipate any potential future problems
- f) Performing maintenance and routine adjustments to automated water treatment controls
- g) Providing the high purity materials to be used in the water treatment program
- h) Providing analytical devices to facility staff for QA/QC if requested
- i) Servicing the equipment to be used in the water treatment program
- j) Performing informal training to review equipment operation and controls
- k) Performing informal training on safety with our products, including SDS and PPE review
- l) Provision of written service reports in electronic format to be generated and emailed to all facility staff requested identifying all testing and recommendations
- m) Providing emergency on-site responses within 24 hours
- n) Maintaining a neat, safe and orderly job site with the removal of our depleted materials and minor cleaning as needed



- o) Updating controls as available with logic data to maximize system operating efficiency
- p) Offer new products as they become available for energy conservation, water conservation, and green initiatives
- q) Providing quality analysis as needed to determine any problem areas noted
- r) Providing microbiological testing on the required systems as needed
- s) Providing trace impurity testing on loops and verify components for degradation
- t) Balance and rotate pump loads to maximize equipment life span
- u) Track ambient air conditions and modulate system controls to minimize component degradation
- v) Maintain an adequate treatment inventory and move it between the locations to balance system usage and minimize operating costs
- w) Utilize well qualified service staff to perform these services which shall typically have a BS Degree in the Sciences or Engineering
- x) Report to facility staff any unusual equipment conditions or potential problems in operation
- y) Offer means of provision and installation services for water related equipment
- z) Maintain a history of operation and report necessary trends in the system to assist in predictive maintenance and operating efficiency

Additional analytical and engineering support for the systems if needed during service calls:

- a) Certification lab results for analytical wet chemistry and microbiological analysis
- b) Reviews for potential LEED credits
- c) Wear and stress detection for operating systems
- d) Ultrasonic thickness of pipe walls and components to determine available materials remaining
- e) System voltage and ampacity measurement to verify proper operation
- f) Vibration reviews
- g) Water system particle density analysis



Overall, when all of these qualities are combined, JMU should anticipate that the related water systems shall be well taken care of, just as we have for the last 25 years.



<p style="text-align: center;">Products and Services Offered <i>As given in the RFP Page 7, Part V, Section B.2</i></p>
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All Water Chemistry, Inc. Products and Services shall meet or exceed the requirements as given in the RFP on Page 1, Part IV, Section A.2 Statement of Needs.

QUALIFICATIONS OF STAFF SUPPORTING

F. Scott Russow – Contract Supervisor, Regional Manager: He has a Bachelor of Science in Physics/Chemistry and has served in the water treatment industry for over 45 years. He has designed and implemented hundreds of HVAC, ultra-pure, and RO water treatment systems for both Governments and Industry. In the 1980's, he designed and installed the first zero-blowdown cooling tower system in use in GSA's National Capital Region group of buildings. He is the sole water consultant for the Technical Expert for White House Facilities. He has developed and implemented many new and creative chemical treatment products and has been an industry leader in advanced polymer design and implementation. He is a loyal member of the Association of Facilities Engineering. He has been a night class instructor for facility maintenance staff with the National Association of Power Engineers. He is a licensed Electrician, Certified Welder and has over 20 years in the heating and cooling industry, installing and servicing all types of building equipment including, but not limited to: chillers, cooling towers, pumps, air handlers, fan coil units, pneumatics, heat exchangers (plate and U-tube), valves, building controls, boilers, and piping systems (glass, PVC, PDVF, polypropylene, copper, brass, stainless steel, mild steel, galvanized steel, cast and ductile iron). This gives him a unique broad range of experience to draw from when troubleshooting and diagnosing problems with water treatment systems. He not only understands the chemistry, he understands mechanical operation. He has had safety certifications for years, including OSHA 30 Construction, First Aid, CPR, Bloodborne Pathogens and ECATTA's. His 24 hour cellular number is (703) 328-1671.

Derek Russow – Alternate Contact Service: He has a Bachelor of Science in Mechanical Engineering from Virginia Polytechnic Institute and State University and has worked with Water Chemistry for over 10 years. He specializes in high purity systems, heat transfer and fluid surface exchange studies, high and low pressure boiler systems, large central plant chillers and all types of closed systems. He implements the most up to date treatment technology and methods for open and closed water systems to reduce the effects of fouling and increase the service life of HVAC equipment. He has been designing, servicing and performing services for water systems and is well versed in their characteristics. He has had OSHA 30 Construction safety certifications for years. His 24 hour number is (804) 335-6770.

Luke Russow – Alternate Contact Service: He has a Bachelor of Science in Biological Sciences from Virginia Polytechnic Institute and State University and has worked with Water Chemistry for over 7 years. He specializes in biological control systems, heat transfer, cooling towers, boilers and domestic water systems along with minimizing system biological degradation and contamination. He implements the most up to date treatment technology and methods for open and closed water systems to increase the service life of HVAC equipment. He has been performing services for water systems and is well versed in their characteristics and environmental impact. He has had OSHA 30 Construction safety certifications for years. His 24 hour number is (804) 221-6261.



<p style="text-align: center;">Products and Services Offered <i>As given in the RFP Page 7, Part V, Section B.2</i></p>
--

All Water Chemistry, Inc. Products and Services shall meet or exceed the requirements as given in the RFP on Page 1, Part IV, Section A.3-A.7 Statement of Needs.

All chemicals, other materials or devices, and their method of use shall conform to federal, state, and local ordinances and laws. Water Chemistry shall provide Safety Data Sheets (SDS) for all hazardous products to be used at each work site prior to their delivery and use at the facility.

Water Chemistry shall take necessary precautions in the use of chemicals for both water treatment and any chemical cleaning of machinery or equipment to obviate the possibility of accidents. Water Chemistry shall be responsible for any hazardous waste created from the treatment or cleaning process.

Chemicals and other materials or devices used in the water treatment shall not be capable of damaging in any manner, the internal workings of the equipment being serviced when utilized per manufacturer's recommendations.

Water Chemistry shall provide testing of all glycol systems via refractive index and provide recommendations.

Water Chemistry shall fully utilize until depleted existing chemicals that are on site at each facility and may be responsible for removing containers when empty on a case by case basis.



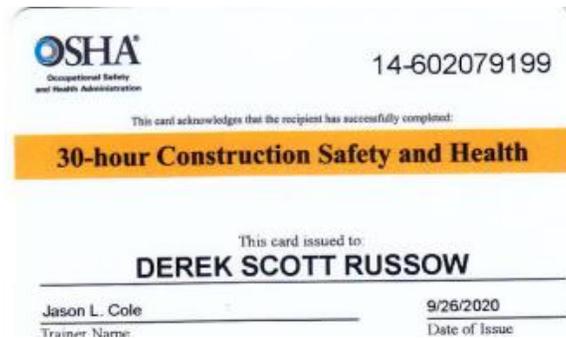
Products and Services Offered
As given in the RFP Page 7, Part V, Section B.2

All Water Chemistry, Inc. Products and Services shall meet or exceed the requirements as given in the RFP on Page 1, Part IV, Section A.8 Statement of Needs.

F. Scott Russow – Contract Supervisor, Regional Manager: He has a Bachelor of Science in Physics/Chemistry and has served in the water treatment industry for over 45 years. He has had safety certifications for years, including OSHA 30 Construction, First Aid, CPR, Bloodborne Pathogens and ECATTA’s. The OSHA 30 Certification is shown below. His 24 hour cellular number is (703) 328-1671.

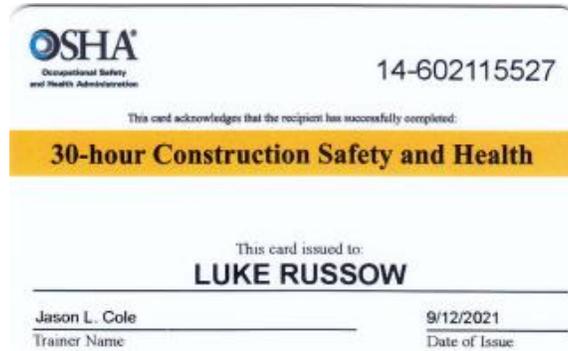


Derek Russow – Alternate Contact Service: He has a Bachelor of Science in Mechanical Engineering from Virginia Polytechnic Institute and State University and has worked with Water Chemistry for over 10 years. He specializes in high purity systems, heat transfer and fluid surface exchange studies, high and low pressure boiler systems, large central plant chillers and all types of closed systems. He has had OSHA 30 Construction safety certifications for years. The OSHA 30 Certification is shown below. His 24 hour number is (804) 335-6770.





Luke Russow – Alternate Contact Service: He has a Bachelor of Science in Biological Sciences from Virginia Polytechnic Institute and State University and has worked with Water Chemistry for over 7 years. He specializes in biological control systems, heat transfer, cooling towers, boilers and domestic water systems along with minimizing system biological degradation and contamination. He has had OSHA 30 Construction safety certifications for years. The OSHA 30 Certification is shown below. His 24 hour number is (804) 221-6261.





<p style="text-align: center;">Products and Services Offered <i>As given in the RFP Page 7, Part V, Section B.2</i></p>
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All Water Chemistry, Inc. Products and Services shall meet or exceed the requirements as given in the RFP on Page 1, Part IV, Section A.8-A11 Statement of Needs.

Water Chemistry shall perform work during 7:30 AM – 4:00 PM, Monday thru Friday.

At times this contract may require emergency responses. Emergency response time shall be within forty-eight (48) hours of notification of the emergency. Our Main Office number is 540-343-3618. The cell number for F. Scott Russow is (703) 328-1671.

As non-capital and capital construction projects arise, contractor will be responsible for working with Facilities Management's (FM) Facilities Planning & Construction and FM's Engineering Department, as well as their general contractor, to provide services as stated in this solicitation. Upon end of warranty, Water Chemistry will continue to service these buildings on a normal monthly/quarterly basis as determined by FM's HVAC Shop.



<p style="text-align: center;">Products and Services Offered <i>As given in the RFP Page 7, Part V, Section B.2</i></p>
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All Water Chemistry, Inc. Products and Services shall meet or exceed the requirements as given in the RFP on Page 1, Part IV, Section B.1 and B.2 Statement of Needs.

Please see the following service reports from earlier this year indicating testing and reporting currently being performed by Water Chemistry for James Madison University.



Water Chemistry inc.

3404 Aerial Way Drive • Roanoke, VA 24018
 Phone (540) 343-1618 • Fax (540) 342-2054

SERVICE REPORT

Location: JMU Main Campus – Harrisonburg, VA
 Cooling Towers
Contact: Mr. Jeff Price, Facilities
 Phone: (540) 290-3689, Email: price3js@jmu.edu
Date: June 14, 2023

ANALYSIS <i>Expressed in PPM unless other unit is specified</i>	Conductivity (µS)	pH	Organic Phosphate	OBSERVATIONS AND RECOMMENDATIONS FOR COOLING TOWERS AND RELATED WATER TREATMENT EQUIPMENT				
				Makeup Water Analysis:	Conductivity/TDS: pH: Total Alkalinity:	192 / 142 7.2 60	Total Hardness: Calcium Hardness: Ortho Phosphate:	80 60 1.0
LIMITS:	500 To 950		10 ppm to 20 ppm					
University Services Cooling Tower	677	8.1	12	The system was showing adequate bleed.				
Memorial Cooling Tower	601	8.0	12	The system was showing adequate bleed.				
Performing Arts Cooling Tower 1	579	8.0	10	The system was showing adequate bleed.				
Performing Arts Cooling Tower 2	542	8.0	10	The system was showing adequate bleed.				
Duke Cooling Tower	599	8.1	12	The system was showing adequate bleed.				
Lakeview Cooling Tower	483	7.8	2	The system was showing excessive water losses.				
West Dining Cooling Tower	632	8.1	12	The system was showing adequate bleed.				
Wilson Cooling Tower	566	8.1	10	The system was showing adequate bleed.				
Lake B Cooling Tower	721	8.0	12	The system was showing adequate bleed.				
Roop Cooling Tower	534	8.1	12	The system was showing adequate bleed.				
Music Cooling Tower	555	8.1	10	The system was showing adequate bleed.				
Burruss Cooling Tower	547	8.1	10	The system was showing adequate bleed.				
New Library Cooling Tower 1	522	8.0	12	The system was showing adequate bleed.				
New Library Cooling Tower 2	753	8.2	10	The system was showing adequate bleed.				
Old Library Cooling Tower	480	8.1	10	The system was showing excessive water losses.				
Grace Street Housing Cooling Tower	503	8.0	10	The system was showing adequate bleed.				
SSC – Student Success Cooling Tower	571	8.2	12	The system was showing adequate bleed.				
CHBS Cooling Tower	539	8.1	10	The system was showing adequate bleed.				
Taylor Cooling Tower	599	8.1	12	The system was showing adequate bleed.				
Montpelier (East Rise) Cooling Tower	526	8.1	10	The system was showing adequate bleed.				
East Campus Dining Cooling Tower	554	8.1	10	The system was showing adequate bleed.				
Convo Cooling Tower				Under renovation				
Showker Cooling Tower	523	8.0	12	The system was showing adequate bleed.				
AUBC Arena Cooling Tower	602	8.1	10	The system was showing adequate bleed.				

Service By: F. Scott Russow • Cell number (703) 328-1671 • Email: scott.russow@waterchemistry.com



3404 Aerial Way Drive • Roanoke, VA 24018
 Phone (540) 343-1618 • Fax (540) 342-2054

SERVICE REPORT

Location: JMU Main Campus – Harrisonburg, VA
 Closed Loops – Ryan Price Locations
Contact: Mr. Jeff Price, Facilities
 Phone: (540) 290-3689, Email: price3js@jmu.edu
Date: July 12, 2023 **Page 1 of 3**

ANALYSIS <i>Expressed in PPM unless other unit is specified</i>	Conductivity (µS)	pH	Nitrite	Glycol Freeze Point (°F)	RECOMMENDATIONS FOR CLOSED LOOPS
LIMITS:					
University Services Cooling	144	7.4	50		This system is low in inhibitor and needs a dose or corrosion may form.
Memorial Hall Cooling	611	9.1	300		This system is low in inhibitor and needs a dose or corrosion may form.
Performing Arts Cooling	754	9.4	400		This system is in ranges.
Duke Heating	682	9.3	350		This system is low in inhibitor and needs a dose or corrosion may form.
Duke Heat Recovery Prop Gly Loop		8.4		+ 9	This system is in ranges.
Duke Cooling	1202	9.6	600		This system is in ranges.
Wilson Heating	1807	9.8	900		This system is in ranges.
Wilson Cooling	1760	9.8	800		This system is in ranges.
Lake F Dual Temp	905	9.5	500		This system is low in inhibitor and needs a dose or corrosion may form.
Lake B Dual Temp	962	9.5	500		This system is low in inhibitor and needs a dose or corrosion may form.
Roop Heating	2630	9.9	1150		This system is adequate
Roop Cooling	1674	9.8	850		This system is adequate
Lakeview Building Loop WSHP's	1722	9.7	850		This system is in ranges.
Music Heating	2320	9.8	1200		This system is low in inhibitor and needs a dose or corrosion may form.
Music Cooling	1722	9.8	850		This system is low in inhibitor and needs a dose or corrosion may form.
Sheldon Heating	1327	9.7	650		This system is low in inhibitor and needs a dose or corrosion may form.
Sheldon Cooling Prop Gly Loop		8.3		+ 5	This system is in ranges.
Alumnae Heating	2263	9.6	1150		This system is adequate
Burruss Heating	614	9.1	300		This system is low in inhibitor and needs a dose or corrosion may form.
Burruss Cooling	898	9.4	400		This system is in ranges.
Carrier Library New Heating					No sample
Carrier Library New Cooling					No Sample
Grace Steet Heat Pump Loop	2052	9.8	950		This system is in ranges.



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 Phone (540) 343-1618 • Fax (540) 342-2054

SERVICE REPORT

Location: JMU Main Campus – Harrisonburg, VA
 Closed Loops – Ryan Price Locations
Contact: Mr. Jeff Price, Facilities
 Phone: (540) 290-3689, Email: price3js@jmu.edu
Date: July 12, 2023 **Page 2 of 3**

ANALYSIS <i>Expressed in PPM unless other unit is specified</i>	Conductivity (µS)	pH	Nitrite	Glycol Freeze Point (°F)	RECOMMENDATIONS FOR CLOSED LOOPS
LIMITS:	800 To 3000	<u>Glycol</u> 8.0 – 9.5 <u>Others</u> 9.0-10.5	<u>Chill</u> 400-800 <u>Hot-Dual</u> 800- 1200	+10 °F To -20 °F	
					No sample
					No Sample
					No Sample
Miller Heating Prop Gly Loop		8.3		+ 3	This system is in ranges.
Miller Cooling Prop Gly Loop		8.4		+ 3	This system is in ranges.
Miller Reheat	1917	9.8	950		This system is adequate.
Massanutten Cooling 1 Prop Gly Loop		8.4		- 3	This system is in ranges.
Massanutten Cooling 2 Prop Gly Loop		8.4		- 4	This system is in ranges.
Keezell Heating	391	8.0	100		This system is low in inhibitor and needs a dose or corrosion may form.
Keezell Cooling	1816	9.7	900		This system is adequate.
Maury Heating	343	8.4	50		This system is low in inhibitor and needs a dose or corrosion may form.
Maury Cooling	362	8.0	50		This system is low in inhibitor and needs a dose or corrosion may form.
Maury Reheat	6944	9.9	3200		This system is high and needs to be flushed.
Hoffman Heating Prop Gly Loop		8.3		+ 8	This system is in ranges.
Hoffman Dual Temp Prop Gly Loop		8.4		+ 9	This system is in ranges.
Varnier Heating	2212	9.9	1100		This system is in ranges.
Varnier Cooling	1772	9.8	800		This system is adequate
Wayland Ground Loop	277	7.8	50		This system is low in inhibitor and needs a dose or corrosion may form.
Wayland Dom. Heat Recovery	272	7.8	50		This system is low in inhibitor and needs a dose or corrosion may form.
Wayland Dual Temp	1588	9.6	800		This system is in ranges.
Moody Heating	2078	9.8	1050		This system is adequate.
Jackson Heating	2312	9.8	900		This system is adequate.
Jackson Cooling Prop Gly Loop					Tied into Harrison – same loop



3404 Aerial Way Drive • Roanoke, VA 24018
 Phone (540) 343-1618 • Fax (540) 342-2054

SERVICE REPORT

Location: JMU Main Campus – Harrisonburg, VA
 Closed Loops – Dan Adkins Locations
Contact: Mr. Jeff Price, Facilities
 Phone: (540) 290-3689, Email: price3js@jmu.edu
Date: July 12, 2023 Page 1 of 3

ANALYSIS <i>Expressed in PPM unless other unit is specified</i>	Conductivity (µS)	pH	Nitrite	Glycol Freeze Point (°F)	RECOMMENDATIONS FOR CLOSED LOOPS
LIMITS:	800 To 3500	<u>Glycol</u> 8.0 – 9.5 <u>Others</u> 9.0-10.5	<u>Chill</u> 400-800 <u>Hot-Dual</u> 800- 1200	+10 °F To -20 °F	
Constitution Heating	1199	9.6	600		This system is low in inhibitor and needs a dose or corrosion may form.
Constitution Cooling	837	9.5	400		This system is adequately charged.
Constitution Pre-Heat	1612	9.8	700		This system is low in inhibitor and needs a dose or corrosion may form.
Constitution Heat Second Floor	3988	9.9	1200		This system is adequate.
Wine-Price Heating	1574	9.6	750		This system is low in inhibitor and needs a dose or corrosion may form.
Wine-Price Cooling	1248	9.7	600		This system is adequate
Warren Heating	960	9.5	450		This system is low in inhibitor and needs a dose or corrosion may form.
Warren Rad Heating	284	8.1	100		This system is low in inhibitor and needs a dose or corrosion may form.
Taylor Heating	141	8.1	50		This system is low in inhibitor and needs a dose or corrosion may form.
Taylor Cooling	1182	9.6	550		This system is adequately charged.
East Campus Dining Cooling	629	9.4	400		This system is adequately charged.
Convo Heating	2841	9.9	1150		This system is adequately charged.
Convo Cooling	1748	9.8	800		This system is adequately charged.
UREC Heating	166	7.6	50		This system is low in inhibitor and needs a dose or corrosion may form.
UREC Rad Pool Loop	294	7.8	50		This system is low in inhibitor and needs a dose or corrosion may form.
UREC Rad Building Loop	2024	9.8	1100		This system is adequately charged.
UREC New Hot Water Loop	1883	9.6	850		This system is adequately charged.
Showker Cooling	974	9.5	450		The system is adequately charged.
CoB Heating	237	7.5	50		This system is low in inhibitor and needs a dose or corrosion may form.
AUBC Cooling	532	9.0	200		This system is low in inhibitor and needs a dose or corrosion may form.
Grafton Heating	2998	9.9	1200		This system is adequately charged.
Grafton Cooling Prop Gly Loop		8.5		+ 8	The system is in ranges.
Dukes Dining Heating Prop Gly Loop		8.3		- 4	The system is in ranges.
Dukes Dining Cooling Prop Gly Loop		8.2		- 4	The system is in ranges.
Plecker-APC Heating Loop	208	7.8	50		This system is low in inhibitor and needs a dose or corrosion may form.



Water Chemistry inc.

3404 Aerial Way Drive • Roanoke, VA 24018
 Phone (540) 343-1618 • Fax (540) 342-2054

SERVICE REPORT

Location: JMU Main Campus – Harrisonburg, VA
 Closed Loops – Dan Adkins Locations

Contact: Mr. Jeff Price, Facilities
 Phone: (540) 290-3689, Email: price3js@jmu.edu

Date: July 12, 2023 Page 2 of 3

ANALYSIS <i>Expressed in PPM unless other unit is specified</i>	Conductivity (µS)	pH	Nitrite	Glycol Freeze Point (°F)	RECOMMENDATIONS FOR CLOSED LOOPS
LIMITS:					
Pleacker-APC Cooling Prop Gly Loop		8.4		+ 8	The system is in ranges.
McGraw Long Dual Temp					No sample
McGraw Long Reheat					No sample
Bell Dual Temp	317	8.2	100		This system is low in inhibitor and needs a dose or corrosion may form.
Bell Reheat	311	8.2	100		This system is low in inhibitor and needs a dose or corrosion may form.
Hillside Dual Temp	808	9.4	350		This system is low in inhibitor and needs a dose or corrosion may form.
ISAT/CS A1 Heating	816	9.5	450		This system is low in inhibitor and needs a dose or corrosion may form.
ISAT/CS A1 Cooling	1644	9.7	800		This system is adequately charged.
HHS A2 Heating	428	9.0	250		This system is low in inhibitor and needs a dose or corrosion may form.
Physics/Chem A3 Heating	741	9.4	350		This system is low in inhibitor and needs a dose or corrosion may form.
Physics/Chem Preheat Prop Gly Loop		8.5		+ 5	This system is in ranges.
Physics/Chem Heat Rec Prop Gly Loop		8.4		+ 5	This system is in ranges.
A3-B Heating AHU Hot Water Loop	1630	9.8	850		This system is adequately charged.
A3-B Heating VAV Hot Water Loop	1022	9.6	500		This system is low in inhibitor and needs a dose or corrosion may form.
A3-B Heating GRH Hot Water Loop	246	8.0	50		This system is low in inhibitor and needs a dose or corrosion may form.
A3-B Heat Recovery Prop Gly Loop @ET-5		8.4		+ 5	This system is in ranges.
A3-B Heat Recovery Prop Gly Loop @ET-6		8.5		+ 5	This system is in ranges.
Bookstore Cooling Prop Gly Loop		8.5		+ 4	This system is in ranges.
Godwin Heating	122	7.6	50		This system is low in inhibitor and needs a dose or corrosion may form.
Godwin Cooling	799	9.3	300		This system is low in inhibitor and needs a dose or corrosion may form.
Festival-College Cnt New Heating	258	8.6	100		This system is low in inhibitor and needs a dose or corrosion may form.
Festival-College Cnt Old Heating	162	8.2	50		This system is low in inhibitor and needs a dose or corrosion may form.
Leeolou Heating	3199	9.9	1200		This system is adequate



3404 Aerial Way Drive • Roanoke, VA 24018
Phone (540) 343-1618 • Fax (540) 342-2054

SERVICE REPORT

Location: James Madison University – West Plant
 Harrisonburg, VA
Contact: Mr. Dennis Hart
 Phone: (540) 430-3135, Email: hartdb@jmu.edu
 Jason Bauer; (540) 705-4926; Email: bauer2wj@jmu.edu
Date: May 10, 2023

ANALYSIS <i>Expressed in PPM unless other unit is specified</i>	Total Hardness	Phenol Alkalinity	Total Alkalinity	Hydrate Alkalinity	Sodium Sulfite	Ortho Phosphate	pH	Nitrite	Dissolved Oxygen	Total Dissolved Solids	Conductivity	Temperature Deg. F
LIMITS:				400 To 600	40 To 60	20 To 40	<u>Cond.</u> 7.8–8.4		< 50 ppb		<u>Steam</u> 4000 to 4800	
Raw Water	40		40				7.2				104	
Softener #1	0										105	
Softener #2	0										105	
DA #1 (Boilers 1&2)	0										28	
DA#2 (Boiler 5)	0										15	
Steam Boiler #1		700	800	600	40	30		Stand	By		4251	
Steam Boiler #2		450	500	400	40	40		On	Line		2544	
Steam Boiler #5		300	350	250	40	30		Stand	By		2009	
North Campus Condensate	0						8.4			5.4		
Logan Condensate	0						8.4			5.5		
Kitchen Condensate	0						8.3			4.9		
Godwin Condensate	0						8.4			5.2		

OBSERVATIONS AND RECOMMENDATIONS

- 1) The Softeners were producing soft water which should yield good results.
- 2) The Feedwater was showing no hardness.
- 3) The Boiler #1 was on standby.
- 4) The Boiler #2 was on line and cycling into ranges with operation.
- 5) The Boiler #5 was on standby.
- 6) Condensate lines were in adequate pH ranges.

Feedwater Systems Dosages

80-D: 3 oz. per Tank

Current Plant Log Steam Boiler Dosages

	91-H (Alk)	92-V (PO ₄)	92-S (Polymer)	42-A (Steam)		
				200#	100#	#5
Boiler 1	0 oz	0 oz	0 oz			
Boiler 2	0 oz	32 oz	64 oz	80 oz	80 oz	
Boiler 5	0 oz	0 oz	0 oz			

Service By: F. Scott Russow • Cell number (703) 328-1671 • Email: scott.russow@waterchemistry.com



3404 Aerial Way Drive • Roanoke, VA 24018
Phone (540) 343-1618 • Fax (540) 342-2054

SERVICE REPORT

Location: James Madison University – East Plant
 Harrisonburg, VA

Contact: Mr. Dennis Hart; (540) 430-3135, Email: hartdb@jmu.edu
 Mr. Steve MacRae; (540) 820-3285, Email: macraess@jmu.edu

Date: May 10, 2023

ANALYSIS <i>Expressed in PPM unless other unit is specified</i>	Total Hardness	Phenol Alkalinity	Total Alkalinity	Hydrate Alkalinity	Sodium Sulfite	Ortho Phosphate	pH	Sodium Nitrite	HST-IC Inhibitor Trace ppb	Fast DPD Free Bromine	Conductivity	Temperature Deg. F	Stability Index
Raw Water	40		40				7.2				104		
Softener #1	0										104		
Softener #2	0										105		
DA Feedwater	0										19		
Steam Boiler #3		450	550	350	50	20					2272		
Steam Boiler #4		450	550	350	40	20					2203		
West Condensate	0						8.4				5.9		
East Condensate	0						8.4				6.0		
Condensers 1-4	240		230				8.2		162.6	0.4	668	70.1	5.8
Chilled Water							9.7	650			1388		

OBSERVATIONS AND RECOMMENDATIONS

- 1) The Softeners were producing soft water which should yield good results.
- 2) The Feedwater was showing no hardness.
- 3) The Boilers are cycling up with operation.
- 4) The condensate pH was adequate.
- 5) The Condenser (Tower) Water was cycling in ranges.
- 6) The Chilled Water System was in ranges.

Feedwater Systems Dosages

80-D: 1 oz. per Tank

Condenser System Dosages

HST-IC Inhibitor at 120 ppb ProClear Setting 60/60 Pump

28-I Bio: 5 hours 1X per week (Wed Night)

BR-2 Bio at 3 hours 2X per week (Mon & Fri Night)

Chilled Water Dosages

CLC: Dosage pump at 10%F & 40%S

Current Plant Log Steam Boiler Dosages

	91-H	92-V	92-S	80-D	42-A
	(Alk)	(PO₄)	(Polymer)	(SO₃)	(Steam)

Boiler 3	2 cup	2 cups	2 cups	0 oz	0 cup
Boiler 4	2 cup	2 cups	2 cups	1 oz	0 cup

Service By: F. Scott Russow • Cell number (703) 328-1671 • Email: scott.russow@waterchemistry.com



<p style="text-align: center;">Products and Services Offered <i>As given in the RFP Page 7, Part V, Section B.2</i></p>
--

All Water Chemistry, Inc. Products and Services shall meet or exceed the requirements as given in the RFP on Page 1, Part IV, Section C.1-C.2 Statement of Needs.

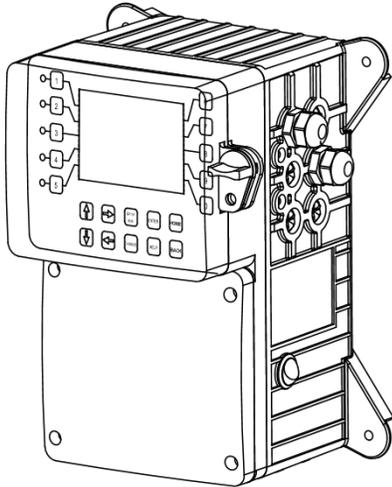
Currently, the vast majority of equipment utilized under this contract are the tower chemical treatment controllers, chemical dosing pumps and high capacity filter feeders, all to be connected per manufacturers recommendations and per electrical code where it applies.

The following pages are the cut sheets for these products currently used by James Madison University.



3404 Aerial Way Drive • Roanoke, VA 24018
 Phone (540) 343-1618 • Fax (540) 342-2054

ProClear Optical Tracing Controls



**Microprocessor
 Control of:**

- Conductivity
- pH
- ORP
- Optical Chemical Feed
- Biocide Feed
- Service Reports
- 4 – 20 mA In & Outs

Key Features:

- Customizable LCD Display
- On Board History Graphs
- Simple ATM Style Menu
- One Point Calibration
- Internet Communications Option
- 5 Assignable Relays
- Relay Test Keys
- Customizable Notepad
- Multi-Level Security Code
- LSI or RSI Index Options
- 1 Year Replacement Warranty
- Email Alarm Capable
- MODbus and BACnet Options

Build a Model:

The model number starts with XS followed by the code for each function needed for the first system.

Once the main control functions have been selected, insert another - and list the desired common options.

Conductivity Control (1 per system max)

B2 = BE-32 Standard Boiler probe

C = TE-4A Standard Tower probe

PH Control (1 per system max)

P = TPE-21 Standard Tower probe

ORP Control (1 per system max)

R = TOE-21 Standard ORP probe

Feed Timers (max of 5 per system)

F1 to F5 (F4 = Four feed timers)

Flow Switch

E = Flow Switch

OPTIONS

A - Conduit connection

A3 - Conduit with CE approval

H1 - Internet Connect Communications

H4 - Internet card with phone modem

H5 - Internet card with cellular router

H11 - Internet card w/ CAT5 & Modbus TCP/IP

H21 - Internet card w/ CAT5 & BACNet TCP/IP

H31 - Internet card for LonWorks

N3 - (3) 4-20mA Inputs (no option U3 if selected)

O3 - (3) 4-20mA Outputs

S - pH saturation indexes (with pH control)

U3 - ProBlue Option, (3) 0-5 volt inputs (no option N3 if selected) **V** - 5 volt D.C. output with water meter wires

W3 - (3) Auxiliary flow meter inputs

Y - Agency Approval (ETL, US&C)

Specifications:

Electrical

• **Input:** 95-240 VAC, 50/60 Hz

• **Control:** Equal to input voltage (95-240VAC) fused at 2.5A per relay. Prewired units are supplied with an 8' (248.84 cm) power cord and 8" (20.32 cm) output receptacles.

Operational

• **Display:** 240 X 128 Graphic LCD

• **pH:** 0-14 scale

• **Accuracy:** +/- 1%

• **Feed Timers are all selectable from:**

Pulse: water meter activated w/accumulator, **Percent:** 1-100% of a cycle time

Limit: Limits feed with bleed. **Post:** 1-100% of post bleed or other time with an over all limit.

28 Day - biocide timer.

Enclosure: Heavy duty NEMA 4X style high impact thermoplastic with gasketed door.

Electrodes

Tower Standard electrodes are supplied in 3/4" (1.91 cm) SCH 80 PVC female slip tees with quick release nut.

• **Conductivity:** TE-4A 150 psi / 140oF Max, **pH:** TPE-2 100 psi / 140oF Max

• **ORP:** TOE-2 100 psi / 140oF Max, **Temperature:** TC-1 150 psi / 140oF Max

Shipping Weight: Approximately 8 lbs.

Dimensions:

W 10" (28.4 cm) x H 12" (30.5 cm) x D 7.25" (18.4 cm)

PULSAFEEDER®

The Pulsatron Series A Plus offers manual function controls over stroke length and stroke rate as standard with the option to select external pace for automatic control.

Ten distinct models are available, having pressure capabilities to 250 PSIG (17 BAR) @ 12 GPD (1.9 lph), and flow capacities to 58 GPD (9.1 lph) @ 100 PSIG (7.0 BAR), with a standard turndown ratio of 100:1, and optional ratio of 1000:1. Metering performance is reproducible to within $\pm 3\%$ of maximum capacity.

Features

- Manual Control by on-line adjustable stroke rate and stroke length.
- Highly Reliable timing circuit.
- Circuit Protection against voltage and current upsets.
- Solenoid Protection by thermal overload with auto-reset.
- Water Resistant, for outdoor and indoor applications.
- Internally Dampened To Reduce Noise.
- Guided Ball Check Valve Systems, to reduce back flow and enhance outstanding priming characteristics.
- Few Moving Parts and Wall Mountable.
- Safe & Easy Priming with durable leak-free bleed valve assembly (standard).
- Optional Control: External pace with auto/manual selection.

Controls



Manual Stroke Rate

Manual Stroke Length

External Pacing - Optional

External Pace With Stop - Optional (125 SPM only)

Controls Options		
Feature	Standard Configuration	Optional Configuration ¹
External Pacing	---	Auto / Manual Selection ²
External Pace w/ Stop (125 SPM only)	---	Auto / Manual Selection ²
Manual Stroke Rate	10:1 Ratio	100:1 Ratio
Manual Stroke Length	10:1 Ratio	10:1 Ratio
Total Turndown Ratio	100:1 Ratio	1000:1 Ratio

Note 1: On S2, S3 & S4 sizes only.

Note 2: Not available on 1000:1 turndown pumps.

Operating Benefits

- Reliable metering performance.
- Rated "hot" for continuous duty.
- High viscosity capability.
- Leak-free, sealless, liquid end.



Aftermarket

- KOPkits
- Gauges
- Dampeners
- Pressure Relief Valves
- Tanks
- Pre-Engineered Systems
- Process Controllers (MicroVision)



PULSAtron® Series A Plus
Electronic Metering Pumps

PULSAtron® Series A Plus

Specifications and Model Selection

MODEL		LBC2	LB02	LBC3	LB03	LB04	LB64	LBC4	LBS2	LBS3	LBS4	
Capacity nominal (max.)	GPH	0.25	0.25	0.42	0.50	1.00	1.25	2.00	0.50	1.38	2.42	
	GPD	6	6	10	12	24	30	48	12	33	58	
	LPH	0.9	0.9	1.6	1.9	3.8	4.7	7.6	1.9	5.2	9.14	
Pressure ³ (max.)	GFPP, PVDF, 316SS or PVC (W code) w/TFE Seats	PSIG (Bar)	250 (17)	150 (10)	250 (17)	150 (10)	100 (7)	100 (7)	50 (3.3)	250 (17)	150 (10)	100 (7)
	PVC (V code) Viton or CSPE Seats / Degass Liquid End		150 (10)									
Connections:	Tubing	1/4" ID X 3/8" OD						3/8" ID X 1/2" OD		1/4" ID X 3/8" OD		
	Piping	1/4" FNPT										
Strokes/Minute	SPM	125								250		

Note 3: Pumps with rated pressure above 150 PSI will be de-rated to 150 PSI Max. when selecting certain valve options, see Price Book for details.

Engineering Data

Pump Head Materials Available: GFPP, PVC, PVDF, 316 SS

Diaphragm: PTFE-faced CSPE-backed

Check Valves Materials Available:
Seats/O-Rings:

PTFE
CSPE
Viton

Balls:

Ceramic
PTFE
316 SS
Alloy C

Fittings Materials Available:

GFPP, PVC, PVDF

Bleed Valve:

Same as fitting and check valve selected, except 316SS

Injection Valve & Foot Valve Assy:

Same as fitting and check valve selected

Tubing:

Clear PVC
White PE

Important: Material Code - GFPP=Glass-filled Polypropylene, PVC=Polyvinyl Chloride, PE=Polyethylene, PVDF=Polyvinylidene Fluoride, CSPE=Generic formulation of Hypalon, a registered trademark of E.I. DuPont Company. Viton is a registered trademark of E.I. DuPont Company. PVC wetted end recommended for sodium hypochlorite.

Engineering Data

Reproducibility: +/- 3% at maximum capacity

Viscosity Max CPS: 1000 CPS

Stroke Frequency Max SPM: 125 / 250 by Model

Stroke Frequency Turn-Down Ratio: 10:1 / 100:1 by Model

Stroke Length Turn-Down Ratio: 10:1

Power Input: 115 VAC/50-60 HZ/1 ph
230 VAC/50-60 HZ/1 ph

Average Current Draw:

@ 115 VAC; Amps: 0.6 Amps

@ 230 VAC; Amps: 0.3 Amps

Peak Input Power: 130 Watts

Average Input Power @ Max SPM: 50 Watts

Custom Engineered Designs – Pre-Engineered Systems



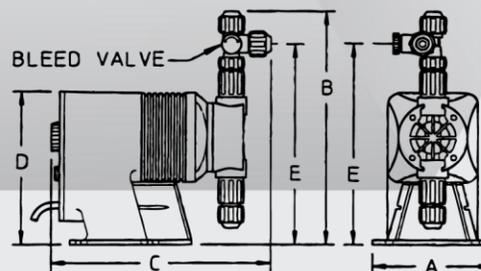
Pre-Engineered Systems

Pulsafeeder's Pre-Engineered Systems are designed to provide complete chemical feed solutions for all electronic metering applications. From stand alone simplex pH control applications to full-featured, redundant sodium hypochlorite disinfection metering, these rugged fabricated assemblies offer turn-key simplicity and industrial-grade durability. The UV-stabilized, high-grade HDPE frame offers maximum chemical compatibility and structural rigidity. Each system is factory assembled and hydrostatically tested prior to shipment.

Dimensions

Series A PLUS Dimensions (inches)						Shipping Weight
Model No.	A	B	C	D	E	
LB02 / S2	5.0	9.6	9.5	6.5	8.2	10
LBC2	5.0	9.9	9.5	6.5	8.5	10
LBC3	5.0	9.9	9.5	6.5	8.5	10
LB03 / S3	5.0	9.9	9.5	6.5	8.5	10
LB04 / S4	5.0	9.9	9.5	6.5	8.5	10
LB64	5.0	9.9	9.5	6.5	8.5	10
LBC4	5.0	9.9	9.5	6.5	8.5	10

NOTE: Inches X 2.54 = cm



27101 Airport Road
Punta Gorda, FL 33982
Phone: ++1(941) 575-3800
Fax: ++1(941) 575-4085

www.pulsatron.com

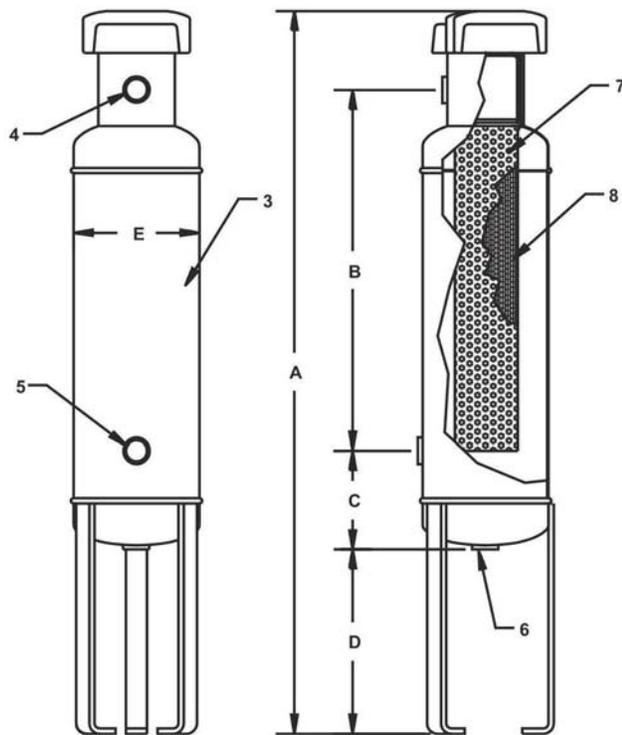
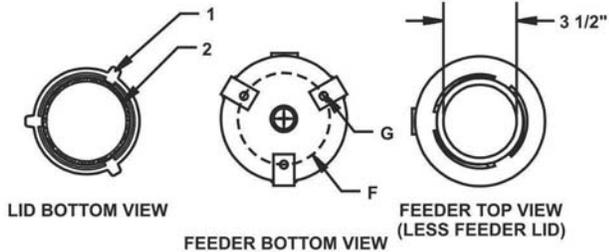


An ISO 9001 Certified Company

EMP025 B15



Filter Feeder Data Sheet



PARTS, MATERIALS AND SPECIFICATIONS

KEY	PART	SPECIFICATIONS
1	3071	CLOSURE: 3 1/2" cast iron, 1/4 turn closure, (O-ring included)
2	3072	O-RING: Buna-N O-ring 200°F
3		BODY: Carbon steel
4		INLET: 3/4" FNPT
5		OUTLET: 3/4" FNPT
6		DRAIN: 3/4" FNPT
7	3160	BASKET: 304 stainless steel basket (2.5"D x 19"L)
8	3161	FILTER: 25 micron bag (2.5"D x 19"L / 93 in ³)
MAX. PRESSURE		200 PSI (13.6 BAR)
MAX. TEMPERATURE		200°F (93°C)

VOLUME (FILL CAPACITY)

MODEL	GALLONS	LITERS
FHC-DB-2HD	2.48	9.39
FHC-DB-5HD	6.39	24.19
FHC-DB-12HD	13.37	50.61

DIMENSIONS, WEIGHT & CUBE:

KEY	FHC-DB-2HD	FHC-DB-5HD	FHC-DB-12HD
A	34 1/8"	33 3/4"	54 3/8"
B	17 1/4"	16 3/4"	37 1/4"
C	4 3/4"	5 3/4"	5 7/8"
D	8 3/4"	7 3/4"	7 3/4"
E	6"	10"	10"
F	4"	8"	8"
G	3/8"	3/8"	3/8"
WEIGHT	30 lbs. (13.6 kgs.)	44 lbs. (20 kgs.)	69 lbs. (31.3 kgs.)
CUBE	6" x 6" x 35"	10" x 10" x 35"	10" x 10" x 56"

Note: All dimensions are +/- 1/8". All weights are approximate. All dimensions are subject to change without notice.



<p style="text-align: center;">Products and Services Offered <i>As given in the RFP Page 7, Part V, Section B.2</i></p>
--

All Water Chemistry, Inc. Products and Services shall meet or exceed the requirements as given in the RFP on Page 1, Part IV, Section D.1 – D.3 Statement of Needs.

On a monthly basis, Water Chemistry shall perform water testing on all cooling towers, and steam boiler systems.

On a monthly basis, Water Chemistry shall perform site inspection visits on cooling towers, steam boiler systems and associated dosing stations. Inspection services at each site will include but not limited to, inspecting the equipment to assess proper functioning and perform all analysis required determining that the water treatment program is operating at optimum performance. Contractor shall submit service report to FM's HVAC / Power Plant / Oil Burner Shop as appropriate.

On a quarterly basis, Water Chemistry shall provide water testing sample bottles of all closed loops and towers and perform system testing on site.

Note, examples of James Madison Service Reports for these items are shown earlier in this proposal package under the B.1 and B.2 heading.



<p style="text-align: center;">Products and Services Offered <i>As given in the RFP Page 7, Part V, Section B.2</i></p>
--

All Water Chemistry, Inc. Products and Services shall meet or exceed the requirements as given in the RFP on Page 1, Part IV, Section E.1 – E.4 Statement of Needs.

Water Chemistry shall provide a suitable amount of corrosion inhibitor material for two months treatment for the open side of the cooling towers/evaporative condenser for prevention of corrosion and mud fouling. This material shall contain no heavy metals, but should contain sequestrants, polymeric dispersants, and corrosion inhibitors for both ferrous and non-ferrous metals. The materials shall be capable of preventing accumulation of metal oxides, mineral scale and silt. The materials shall be stable to oxidizers. Product must be acceptable to the State Water Control Board for discharge. The towers and related controls utilize three different inhibitors, one with a clear optical tracing compound, one with a blue optical tracing compound, and one with no tracing compound. Water Chemistry has provided and show experience with all these products for years at JMU and other referenced customers that will work with existing controls for program operation.

Water Chemistry shall provide a biocide material for prevention of biological fouling in the cooling tower/evaporative condenser systems. This material shall be compatible with the inhibitor treatment and shall also be acceptable for discharge. The biocides shall be both non-oxidizing and oxidizing.

The method for injecting chemicals will be compatible with existing equipment at each site since our treatment and equipment has been used at JMU for decades.

Water Chemistry has furnished a copy of the drum label and OSHA Safety Data Sheet for each Cooling Tower treatment item under Section 8 of this water treatment proposal package.



<p style="text-align: center;">Products and Services Offered <i>As given in the RFP Page 7, Part V, Section B.2</i></p>
--

All Water Chemistry, Inc. Products and Services shall meet or exceed the requirements as given in the RFP on Page 1, Part IV, Section F.1 – F.2 Statement of Needs.

Water Chemistry has provided a treatment for the prevention of corrosion in the hot/chilled closed loop systems at each site for decades. Majority of closed systems utilize sodium nitrite based inhibitors. This material shall be nontoxic on exposure to air.

There are systems that also contain propylene glycol for freeze protection along with sodium molybdate for aluminum core hot water boilers.

If necessary to drain and flush closed-loop systems at sites, the removal of treated water shall be done by the Water Chemistry in a manner which meets all Environmental Protection Agency (EPA) standards.



Products and Services Offered
As given in the RFP Page 7, Part V, Section B.2

All Water Chemistry, Inc. Products and Services shall meet or exceed the requirements as given in the RFP on Page 1, Part IV, Section G.1 Statement of Needs.

If necessary to drain and flush open-loop systems at sites, the removal of non-hazardous water shall be done by the Water Chemistry in a manner which meets all Environmental Protection Agency (EPA) standards and local and state regulations for discharge to open streams.



<p style="text-align: center;">Products and Services Offered <i>As given in the RFP Page 7, Part V, Section B.2</i></p>
--

All Water Chemistry, Inc. Products and Services shall meet or exceed the requirements as given in the RFP on Page 1, Part IV, Section H.1 – H.3 Statement of Needs.

Water Chemistry shall maintain the buildings water treatment dosing work areas in a clean and safe environment.

Water Chemistry will not allow the accumulation of their scraps, debris, waste material or other items not required for chemical treatment.

Water Chemistry shall maintain the job site in a neat and orderly condition.



<p style="text-align: center;">Products and Services Offered <i>As given in the RFP Page 7, Part V, Section B.2</i></p>
--

All Water Chemistry, Inc. Products and Services shall meet or exceed the requirements as given in the RFP on Page 1, Part IV, Section I.1 – I.3 Statement of Needs.

Water Chemistry shall provide a Molybdate based treatment program for Aluminum based boilers that maintains the operating system within the manufacturers design pH and inhibitor ranges for Aluminum based systems.

Water Chemistry shall provide a comprehensive treatment program, typically phosphate, polymer, alkalinity, and sodium sulfite for steam producing boilers to minimize scale, corrosion and deposits and should minimize the accumulation of debris within the boiler vessel. The program shall include necessary oxygen scavengers, dispersants, sequestrants and blended condensate treatments to minimize system operational issues.

Water Chemistry shall maintain steam boilers with monthly services and hot water boilers with quarterly services.

PART 4



Products and Services Offered
As given in the RFP Page 7, Part V, Section B.3

For over 2 decades, Water Chemistry has provided James Madison University with quality products and services that has allowed the various building to appreciate both efficient equipment operation and system longevity.

We have been in the water treatment industry for over 45 years; but our customers don't see our state-of-the-art water services. They see their condensers, boilers, and all related HVAC equipment operating efficiently with lower maintenance costs and down time. Our customers also know that when they hear about a problem with their water systems, it is usually *after* we have spotted it and addressed it, forestalled it or solved it.

For 45 years, Water Chemistry, Inc. has been an industry leader in various areas of institutional water treatment. We have Microbiologists, Chemists, Engineers, Physicists, and licensed tradesmen in numerous areas. As a team, we are able to make sure all the work we are doing meets or exceed industry standards. Shown below is a brief resume of our staff we have chosen to work with you in this project.

F. Scott Russow – Contract Supervisor, Regional Manager: He has a Bachelor of Science in Physics/Chemistry and has served in the water treatment industry for over 45 years. He has designed and implemented hundreds of HVAC, ultra-pure, and RO water treatment systems for both Governments and Industry. In the 1980's, he designed and installed the first zero-blowdown cooling tower system in use in GSA's National Capital Region group of buildings. He is the sole water consultant for the Technical Expert for White House Facilities. He has developed and implemented many new and creative chemical treatment products and has been an industry leader in advanced polymer design and implementation. He is a loyal member of the Association of Facilities Engineering. He has been a night class instructor for facility maintenance staff with the National Association of Power Engineers. He is a licensed Electrician, Certified Welder and has over 20 years in the heating and cooling industry, installing and servicing all types of building equipment including, but not limited to: chillers, cooling towers, pumps, air handlers, fan coil units, pneumatics, heat exchangers (plate and U-tube), valves, building controls, boilers, and piping systems (glass, PVC, PDVF, polypropylene, copper, brass, stainless steel, mild steel, galvanized steel, cast and ductile iron). This gives him a unique broad range of experience to draw from when troubleshooting and diagnosing problems with water treatment systems. He not only understands the chemistry, he understands mechanical operation. He has had safety certifications for years, including OSHA 30 Construction, First Aid, CPR, Bloodborne Pathogens and ECATTA's. His 24 hour cellular number is (703) 328-1671.

Derek Russow – Alternate Contact Service: He has a Bachelor of Science in Mechanical Engineering from Virginia Polytechnic Institute and State University and has worked with Water Chemistry for over 10 years. He specializes in high purity systems, heat transfer and fluid surface exchange studies, high and low pressure boiler systems, large central plant chillers and all types of closed systems. He implements the most up to date treatment technology and methods for open and closed water systems to reduce the effects of fouling and increase the service life of HVAC equipment. He has been designing, servicing and performing services for



water systems and is well versed in their characteristics. He has had OSHA 30 Construction safety certifications for years. His 24 hour number is (804) 335-6770.

Luke Russow – Alternate Contact Service: He has a Bachelor of Science in Biological Sciences from Virginia Polytechnic Institute and State University and has worked with Water Chemistry for over 7 years. He specializes in biological control systems, heat transfer, cooling towers, boilers and domestic water systems along with minimizing system biological degradation and contamination. He implements the most up to date treatment technology and methods for open and closed water systems to increase the service life of HVAC equipment. He has been performing services for water systems and is well versed in their characteristics and environmental impact. He has had OSHA 30 Construction safety certifications for years. His 24 hour number is (804) 221-6261.

It is our firm commitment to you that we will do everything possible to keep your staff educated on new trends in the industry as well as refreshed, through training, on the systems and practices in place. Training may be conducted on an annual basis or as needed or requested.

Water Chemistry, Inc. will work to assist your staff in resolving unforeseen issues which may arise and, most importantly, in preventing water related issues.

Water Chemistry also has the capability to generate electronic service reports. Information on paper is discreet and not easily related and it is difficult to associate one piece of data with another or to evaluate trends. However, each entry carries a wealth of insight about operational efficiency.

Water Chemistry, Inc. strives to provide products and services with best pricing practices to ensure Carilion receives the highest value for services rendered.

To perform this, we first and foremost offer JMU our best price. No other industry group or agency receives higher discounts. We maintain this by being a manufacturer. Water Chemistry has the unique opportunity to manufacture products designed directly for a particular customer. As a manufacturer, with available rail service to our central plant, we have the opportunity to procure items in bulk which minimizes raw costs. This benefit, combined with our materials strategic bidding process, allows Water Chemistry the opportunity to keep costs low while maintaining high quality products and services.

Furthermore, if at any time, JMU finds an exact product that we offer at a lower total cost from a reputable source, including shipping and handling, we shall match or beat that cost to guarantee best pricing practices.

When working directly with our customers, we also employ programs with advanced materials designed to minimize water and energy use while maintaining operating efficiency. When operating in this manner with a well-coordinated series of routine services, the customer can achieve lower operating costs aiding in facility operation.



We look forward to maintaining our cost saving measures as the largest SWaM All Purpose Water Treatment Manufacturer and Service Provider in the Commonwealth of Virginia. This includes water treatment services with access to Certified Labs that performs high purity analytical testing services. We look forward to passing these saving onto you, the customer, in the years to come.

Overall, when all of these qualities are combined, JMU should anticipate that the related water systems shall be well taken care of, just as we have for the last 25 years, and we look forward to the opportunity of carrying forth these tasks for another 10 years.

PART 5

ATTACHMENT A

OFFEROR DATA SHEET

TO BE COMPLETED BY OFFEROR

- 1. **QUALIFICATIONS OF OFFEROR:** Offerors must have the capability and capacity in all respects to fully satisfy the contractual requirements.
- 2. **YEARS IN BUSINESS:** Indicate the length of time you have been in business providing these types of goods and services.

Years 45 Months 7

- 3. **REFERENCES:** Indicate below a listing of at least five (5) organizations, either commercial or governmental/educational, that your agency is servicing. Include the name and address of the person the purchasing agency has your permission to contact.

CLIENT	LENGTH OF SERVICE	ADDRESS	CONTACT PERSON/PHONE #
George Mason University	40 years	4400 University Dr, Fairfax, VA	Rodemil Billones (703) 993-2535
Christopher Newport University	25 years	1 Ave. of the Arts, Newport News, VA	Mike Anielski (757) 594-8738
Sentara Martha Jefferson Hospital	45 years	500 Martha Jefferson Dr, Charlottesville, VA	Sarah Beasley (434) 654-8058
Bridgewater College	1 year	402 E College St, Bridgewater, VA	Chris Meacham (540) 793-9105
Woodrow Wilson Workforce	1 year	PO Box 1500, Fishersville, VA	Chris Keagy (540) 332-7081

- 4. List full names and addresses of Offeror and any branch offices which may be responsible for administering the contract.

Water Chemistry, Inc.

3404 Aerial Way Drive

Roanoke, VA 24018

- 5. **RELATIONSHIP WITH THE COMMONWEALTH OF VIRGINIA:** Is any member of the firm an employee of the Commonwealth of Virginia who has a personal interest in this contract pursuant to the [CODE OF VIRGINIA](#), SECTION 2.2-3100 – 3131?

YES NO

IF YES, EXPLAIN: _____

ATTACHMENT B

Small, Women and Minority-owned Businesses (SWaM) Utilization Plan

Offeror Name: Water Chemistry, Inc. Preparer Name: F. Scott Russow

Date: 10/25/23

Is your firm a **Small Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes X No _____

If yes, certification number: 006709 Certification date: 12/9/2019

Is your firm a **Woman-owned Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes _____ No X

If yes, certification number: _____ Certification date: _____

Is your firm a **Minority-Owned Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes _____ No X

If yes, certification number: _____ Certification date: _____

Is your firm a **Micro Business** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes _____ No X

If yes, certification number: _____ Certification date: _____

Instructions: *Populate the table below to show your firm's plans for utilization of small, women-owned and minority-owned business enterprises in the performance of the contract. Describe plans to utilize SWAMs businesses as part of joint ventures, partnerships, subcontractors, suppliers, etc.*

Small Business: "Small business " means a business, independently owned or operated by one or more persons who are citizens of the United States or non-citizens who are in full compliance with United States immigration law, which, together with affiliates, has 250 or fewer employees, or average annual gross receipts of \$10 million or less averaged over the previous three years.

Woman-Owned Business Enterprise: A business concern which is at least 51 percent owned by one or more women who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in which is owned by one or more women, and whose management and daily business operations are controlled by one or more of such individuals. **For purposes of the SWAM Program, all certified women-owned businesses are also a small business enterprise.**

Minority-Owned Business Enterprise: A business concern which is at least 51 percent owned by one or more minorities or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in which is owned by one or more minorities and whose management and daily business operations are controlled by one or more of such individuals. **For purposes of the SWAM Program, all certified minority-owned businesses are also a small business enterprise.**

Micro Business is a certified Small Business under the SWaM Program and has no more than twenty-five (25) employees AND no more than \$3 million in average annual revenue over the three-year period prior to their certification.

All small, women, and minority owned businesses must be certified by the Commonwealth of Virginia Department of Small Business and Supplier Diversity (SBSD) to be counted in the SWAM program. Certification applications are available through SBSD at 800-223-0671 in Virginia, 804-786-6585 outside Virginia, or online at <http://www.sbsd.virginia.gov/> (Customer Service).

RETURN OF THIS PAGE IS REQUIRED

ATTACHMENT B (CNT'D)
 Small, Women and Minority-owned Businesses (SWaM) Utilization Plan

Procurement Name and Number: RFP# MPM-1195

Date Form Completed: 10/25/23

Listing of Sub-Contractors, to include, Small, Woman Owned and Minority Owned Businesses
 for this Proposal and Subsequent Contract

Offeror / Proposer:
Water Chemistry, Inc.
 Firm

3404 Aerial Way Drive; Roanoke, VA 24015
 Address

F. Scott Russow (540) 343-3618
 Contact Person/No.

Sub-Contractor's Name and Address	Contact Person & Phone Number	SBSD Certification Number	Services or Materials Provided	Total Subcontractor Contract Amount (to include change orders)	Total Dollars Paid Subcontractor to date (to be submitted with request for payment from JMU)
None					

(Form shall be submitted with proposal and if awarded, again with submission of each request for payment)

RETURN OF THIS PAGE IS REQUIRED

PART 6



<p>Products and Services Offered <i>As given in the RFP Page 7, Part V, Section B.6</i></p>
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Water Chemistry currently works with the following VASCUPP members:

Christopher Newport University
George Mason University
James Madison University
Longwood University
Virginia Commonwealth University
Virginia Tech
William & Mary

The total sales to these entities from October 1, 2022 through September 30, 2023 is \$920,355.19.

PART 7

X. PRICING SCHEDULE

The offeror shall provide pricing for all products and services included in proposal indicating one-time and on-going costs. The resulting contract will be cooperative and pricing shall be inclusive for the attached Zone Map, of which JMU falls within Zone 2.

Specify any associated charge card processing fees, if applicable, to be billed to the university.

Add additional rows as needed to list all rates for labor and services as well as goods and equipment offered.

Annual Pricing for Testing, Routine Service, Test Kits and Chemicals	
Ninety Eight (98) closed loops with water	\$ 1,500.00
Twenty Two (22) closed loops with propylene glycol	\$ 1,500.00
Twenty Four (24) cooling towers with a total capacity of 8,108 tons and 31 cooling tower cells	\$ 18,000.00
Monthly review and recommendations of Twenty Four (24) cooling towers and all 31 cooling tower cells	\$ 12,000.00
Perform facility legionella plan testing on 24 cooling towers with quarterly provision of 24 – 5 gallon containers of >12% active sodium hypochlorite and 24 legionella culture CDC Elite certified tests per year	\$ 18,000.00
Price to perform one set of HPC and CDC Elite Certified Legionella	\$250.00

PRICING SCHEDULE BY ZONE									
Regular Time Labor Rates (7:30 AM – 4:00 PM Monday – Friday)*									
Service	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9
Service Technician/Tradesman Labor Rate \$/hour	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00
Engineer/Scientist Labor Rate \$/hour	175.00	175.00	175.00	175.00	175.00	175.00	175.00	175.00	175.00
Overtime/Emergency Labor Rates (Outside of Regular Time working hours)									
Service Technician/Tradesman Labor Rate \$/hour	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00
Engineer/Scientist Labor Rate \$/hour	175.00	175.00	175.00	175.00	175.00	175.00	175.00	175.00	175.00

Labor rates shall include all direct and indirect costs such as transportation, supervision, general and administrative costs and profit, etc. Equipment and other parts/products will be billed as indicated below. Monthly and quarterly service is not included in this section.

Products & Equipment									
% Off List Discount Offered by Zone									
Replacement parts and/or components	10	10	10	10	10	10	10	10	10
New water systems and HVAC related equipment	10	10	10	10	10	10	10	10	10

Other Fees	
Charge Card Processing Fees	0 %

Annual Pricing for Testing, Routine Service, Test Kits and Chemicals	
Monthly review and recommendations of five (5) HP Steam Boilers	\$ 12,000.00
Monthly review and recommendations of six (6) condensate return systems	\$ 3,600.00
Monthly review and recommendations for three (3) DA Feedwater Systems	\$ 1,200.00
Monthly review and recommendations of four (4) water softeners	\$ 600.00
Monthly review and recommendations of four (4) condensers	\$ 18,000.00
Monthly review and recommendations of one (1) centralizer chiller water system	\$ 300.00
Quarterly review and recommendations of ten (10) closed loop heating water systems	\$ 0.00
Quarterly review and recommendations of one (1) RODI system used for humidification in CISAT A3	\$ 0.00

PART 8



Chemical Treatment Products Offered

Water Chemistry, Inc., as a manufacturer in the Commonwealth, has a comprehensive list of water treatment products to provide essential services to our customer base. Given below is a detailed list of the most common products that have seen years of service across your region. This group of products will be more than capable of handling the needs of HVAC, Steam Boilers, and related water systems, and they have been proven effective in controlling scale, corrosion, deposits and microbiological growths throughout the operating seasons.

The following Water Chemistry, Inc. manufactured chemicals are available at discount pricing with the core products chosen for use in this contract identified at the end of this Section.

Condenser Water System, Cooling Tower, and Humidification Products:

Formula CWT-1 Concentrated 50% active stressed and standard condenser liquid water treatment for standard operating systems.

Formula HST-IB Standard stressed blue optically traced condenser liquid water treatment specializing in fouled and/or corroded systems that need a potent product to assist in long term clean up and operation. This product includes tracing dye in the visual range to allow quick visual reference to verify proper treatment levels.

Formula HST-IC Standard stressed clear optically traced condenser liquid water treatment specializing in fouled and/or corroded systems that need a potent product to assist in long term clean up and operation. This product includes tracing dye in the visual range to allow quick visual reference to verify proper treatment levels.

Formula HST-VB Concentrated stressed blue optically traced condenser liquid water treatment specializing in fouled and/or corroded systems that need a potent product to assist in long term clean up and operation. This product includes tracing dye in the visual range to allow quick visual reference to verify proper treatment levels.

Formula SWT-I Standard stabilized condenser liquid water treatment specializing in fouled and/or corroded systems that need a potent product to assist in long term clean up and operation. This product includes tracing dye in the visual range to allow quick visual reference to verify proper treatment levels.

Formula SWT-II Concentrated stabilized condenser liquid water treatment specializing in fouled and/or corroded systems that need a potent product to assist in long term clean up and operation. This product includes tracing dye in the visual range to allow quick visual reference to verify proper treatment levels.



Formula 31-A Highly concentrated acid feed product to reduce the total alkalinity in recirculating water systems.

Microbiocide BR-2 Microbiocide: 17.73% Stabilized liquid bromine oxidizing biocide product designed to control microbiological growths and work synergistically with inhibitors.

Microbiocide 23-M Microbiocide: 15% Polyquat based biocide designed to concentrate its activity in the tower sump and condenser barrel section of a chiller and coordinated to work synergistically with inhibitors.

Microbiocide 25-G Microbiocide: 25% Carbamate based liquid bactericide designed to concentrate its activity in the condenser barrel section of a chiller and coordinated to work synergistically with inhibitors.

Microbiocide 27-B Microbiocide: 20% DBNPA based liquid biocide designed to concentrate its activity in the tower sump and condenser barrel section of a chiller and coordinated to work synergistically with inhibitors.

Microbiocide 28-I Microbiocide: 1.5% Isothiazolin based liquid biocide designed to concentrate its activity in the tower sump and condenser barrel section of a chiller and coordinated to work synergistically with inhibitors.

Closed Chilled, Hot and High Temperature Hot Water System Products:

Formula 54-A Concentrated liquid molybdate system corrosion inhibitor designed for steel and copper systems.

Formula CLC Concentrated 40% active liquid closed system corrosion inhibitor designed for steel and copper systems. This product includes a tracing dye in the visual range to allow quick visual reference to verify proper treatment levels and identify leaks.

Formula 54-AL Concentrated liquid molybdate system corrosion inhibitor designed for aluminum boilers and associated closed systems.

Low and High Pressure Steam Boiler Products:

Formula PO-3 All in one boiler treatment including boiler and no steam line treatments.

Formula PO-4 All in one boiler treatment including boiler and steam line treatments.

Formula 58-B Concentrated quad polymer liquid designed to minimize system deposits and assist in fluid transport of unwanted sludge and debris.



<u>Formula 80-D</u>	Dry catalyzed sulfite based product designed to minimize oxygen attack in steam boiler systems.
<u>Formula 81-H</u>	Concentrated liquid bisulfite based product designed to minimize oxygen attack in steam boiler systems.
<u>Formula 81-HC</u>	Concentrated liquid catalyzed bisulfite based product designed to minimize oxygen attack in steam boiler systems.
<u>Formula 83-M</u>	Liquid sulfite and polymer based product designed to minimize oxygen attack in steam boiler systems.
<u>Formula 90-F</u>	Dry Sodium tripolyphosphate based product designed to precipitate hardness in steam boiler systems.
<u>Formula 91-H</u>	Concentrated 50% active liquid alkalinity builder for steam boiler systems.
<u>Formula 92-R</u>	Concentrated active liquid dispersant polymer boiler treatment for the control of scale and deposits in minimal hardness feedwater conditions
<u>Formula 92-S</u>	Concentrated active liquid dispersant and all polymer boiler treatment for the control of scale and deposits in low hardness feedwater conditions.
<u>Formula 92-V</u>	Concentrated liquid phosphate and dispersant blend boiler treatment for the control of scale and deposits in varying hardness feedwater conditions.
<u>Formula 41-D</u>	Concentrated neutralizing amine for steam and condensate lines to augment condensate system pH to minimize system corrosion
<u>Formula 42-A</u>	Concentrated 35% active blended neutralizing amine (Blend 10% Morpholine, 10% Cyclohexylamine and 15% DEAE) for long and short steam and condensate lines to augment condensate system pH to minimize system corrosion.
<u>Formula 60-SG</u>	Concentrated 40% active neutralizing amine (40% solution of Diethylaminoethanol (DEAE)) for long and short steam and condensate lines to augment condensate system pH to minimize system corrosion.

Miscellaneous Treatment System Products:

<u>Formula 58-A</u>	System cleaner used to remove mill scale, flux, and system debris in recirculating water systems.
<u>Formula Polycool 2</u>	Concentrated >95% Propylene Glycol based antifreeze product with coloring agents and multiple corrosion inhibitors.



<u>Formula CL-2</u>	Highly concentrated liquid chlorine product to be utilized in water systems.
<u>Formula IBT</u>	Idle system treatment to be used in the long term wet storage of closed piping and boiler equipment to minimize or eliminate effects of corrosion and deposition.
<u>Formula SAG</u>	General purpose defoamer
<u>Formula SHP</u>	Concentrated hydrogen peroxide solution
<u>Formula Scale A</u>	Concentrated organic acid base for descaling
<u>Formula Scale C</u>	Concentrated citric acid base for descaling
<u>Formula Scale E</u>	Concentrated alkaline chelate base for descaling
<u>Formula Scale P</u>	Concentrated phosphoric acid base for descaling
<u>Formula Scale X</u>	Concentrated hydrochloric acid base for descaling

Primary treatments designated for this contract:

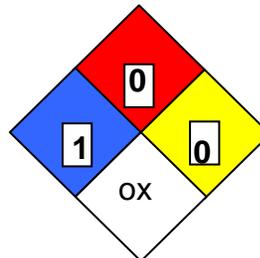
Closed Loops:	Formula CLC, 54-AL, Polycool-2
Cooling Towers:	Formula CWT-I, Formula CL-2, Microbiocide BR-2, Microbiocide 28-I
Steam Boilers:	Formula 92-R, Formula 90-F, Formula 41-D, Formula 80-D, Formula 91-H



3404 AERIAL WAY DRIVE, ROANOKE, VA 24018
(540) 343-3618
Emergency Number: (800) 535-5053



FORMULA CWT-1



Danger

Hazard statement

Irritant

Precautionary statement

Prevention: Will cause severe damage to eyes and irritation to skin.

Response: May be toxic if ingested. Do not ingest. IF IN EYES: Flush with water for 15 minutes and seek medical attention. IF ON SKIN: Wash with water or soap and water, seek medical attention. IF INGESTED: Rinse mouth. Do not induce vomiting. Seek medical attention. **Storage:** Store locked up.

Disposal: Dispose of contents/container in accordance with local/regional/national/international regulations.

Supplemental information

Proprietary Polymer Blend including Acrylic terpolymer, Phosphonobutane-tricarboxylic acid, and Benzotriazole.

Section 1 - Identification

- a) Product Label: Formula CWT-I
- b) Uses: All proper and legal purposes
- d) Manufacturer: Water Chemistry, Inc.
3404 Aerial Way Drive, SW
Roanoke, VA 24018
Phone 540-343-3618
- e) Emergency Phone: (800) 535-5053

Section 2 - Hazard Identification

Signal word: Warning



- a) Hazard classification: Irritant
- b) Signal word: Warning
- c) Precautionary statements: Will cause severe damage to eyes and irritation to skin. May be toxic if ingested. Do not ingest. IF IN EYES: Flush with water for 15 minutes and seek medical attention. IF ON SKIN: Wash with water or soap and water, seek medical attention. IF INGESTED: Rinse mouth. Do not induce vomiting. Seek medical attention.

Section 3 - Composition/information on ingredients that are health hazards

- a) Proprietary Polymer Blend including Acrylic terpolymer, Phosphonobutane-tricarboxylic acid, and Benzotriazole.
- b) General information: The components are not hazardous or are below required disclosure limits at usage rates.

Section 4 - First aid measures

- a)
 1. Inhalation: remove to fresh air, not expected to require first aid measures
 2. Ingestion: Call a physician or poison control center immediately. If conscious, give water or milk. Drink several glasses of water to dilute. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
 3. Skin contact: remove any contaminated clothing, wash skin with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists
 4. Eye contact: immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower lids occasionally. Call a physician if irritation persists.
- b) Most important symptoms: minor irritation may develop on prolonged contact
- c) Special treatment if needed: none recommended

Section 5 - Firefighting measures

- a) Suitable and unsuitable extinguishing media: Water or any media suitable for surrounding fire.
- b) Special fire-fighting procedures: Fire-fighters should wear normal protective equipment including self-contained breathing apparatus.
- c) Specific hazards from combustion products: if water evaporated, oxides of carbon and phosphorus could be produced by combustion.

Section 6 - Accidental release measures

- a) 1. Personal precautions and protective equipment: Keep unnecessary personnel away from of a spill/leak. Wear appropriate personal protective equipment as specified in Section 8. Do not breathe vapors or spray mist.
2. Emergency procedures: secure and ventilate area of spill or leak. In the event of a fire, wear full normal protective clothing including self-contained breathing apparatus.
- b) Methods and materials for containment and cleaning
 - 1. Stop spill or leak at source. Absorb with commercially available absorbent.
 - 2. Contain and recover liquid when possible.

Section 7 - Handling and storage

- a) Store in cool, dry place. Keep container tightly closed when not in use. Keep out of reach of children.

Section 8 - Exposure controls/personal protection

- a) Engineering controls: A system of local or general exhaust is recommended to keep employee exposures minimized. Local exhaust is generally preferred because it can control emissions of the contaminant at its source.
- b) Personal protection equipment: Wear protective gloves, chemical splash goggles, and impervious apron/clothing and footwear. A safety shower and emergency eyewash station should be available in the immediate vicinity of product use.
- c) The product should be use with adequate ventilation.

Section 9 - Physical and chemical properties

- a) Appearance and odor: Clear, pale yellow liquid with bland odor.
- b) Odor threshold: not determined
- c) pH: <7
- e) Melting/freezing point: not applicable
- f) Boiling point: >212 F
- g) Flash point: none
- h) Evaporation rate (butyl acetate=1): not applicable
- i) Flammability: no
- j) Flammability limits: none, non-flammable
- k) Vapor pressure: not determined
- l) Vapor density (air=1): not applicable

- m) Specific gravity (H₂O=1): 1.3± 0.1
- n) Solubility in water: Complete
- r) Viscosity: not determined

Section 10 - Stability and reactivity

- a) Reactivity: non-reactive under ordinary conditions of use and storage
- b) Chemical stability: stable under ordinary conditions of use and storage
- c) Possibility of hazardous reactions: low under ordinary conditions of use and storage
- d) Incompatible materials: may react with strong oxidizing agents, strong alkali
- e) Hazardous decomposition products: Carbon monoxide, carbon dioxide, small amounts of hydrocarbon

Section 11 - Toxicological information

- a) Likely routes of exposure (both acute and chronic):
 - 1. Inhalation: inhalation of mist may be irritating.
 - 2. Ingestion: Will cause gastrointestinal irritation, if ingested
 - 3. Skin contact: irritant on contact
 - 4. Eye contact: irritant on contact
- b) Related symptoms (both acute and chronic):
 - 1. Inhalation: possible irritant
 - 2. Ingestion: irritation, nausea, vomiting or diarrhea
 - 3. Skin contact: irritant
 - 4. Eye contact: severe irritation
- c) Delayed, immediate, and chronic effects from short and long term exposure: none reported
- d) Toxicity data: not available
- e) NTP and IRAC listings: NTP known - no; anticipated - no
IARC category - none

Section 12 - Ecological information

- a) Ecotoxicity data: not tested
- b) Persistence and degradability: not available.
- c) Bioaccumulative potential: none
- d) Mobility in soil: not available

Section 13 - Disposal considerations

Dispose of in accordance with federal, state, and local regulations.

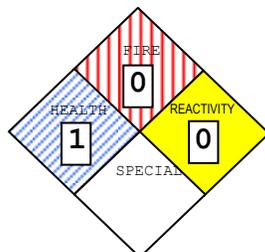
Section 14 - Transport information

- a) UN number: none
- b) UN proper shipping name: none

- c) Transport hazard class(es): none
- d) Packing group: not applicable
- e) Environmental hazards: none
- f) Transport in bulk: no regulation
- g) Special precautions: none found

Section 15 - Regulatory information

a) NFPA ratings:



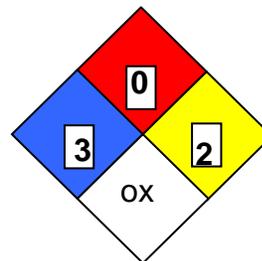
Section 16 - Other Information

- a) Preparation date: 6/1/2018
- b) The information contained in this document (SDS) was obtained from current and reliable sources. However, the data is provided without any warranty, expressed or implied, regarding its correctness or accuracy. Since the conditions or handling, storage and disposal of this product are beyond the control of the manufacturer/supplier, they are not held responsible for loss, injury, and expense arising out of the product's use. No warranty, expressed or inferred, regarding the product described in this document (SDS).



3404 AERIAL WAY DRIVE, ROANOKE, VA 24018
(540) 343-3618
Emergency Number: (800) 535-5053

FORMULA CL-2



Danger

Hazard statement

Causes severe skin burns and eye damage. Causes serious eye damage. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects..

Precautionary statement

Prevention: Do not breathe vapor. Wash thoroughly after handling. Avoid release to the environment. Wear eye protection/face protection. Wear protective gloves/protective clothing/eye protection/face protection..

Response: If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Wash contaminated clothing before reuse. Collect spillage. **Storage:** Store locked up.

Disposal: Dispose of contents/container in accordance with local/regional/national/international regulations.

Supplemental information

12.45% of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 12.45% of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment.

Section 1. Identification

Product identifier: Formula CL-2

Recommended use: All proper and legal purposes

Supplier's details : Water Chemistry, Inc.

3404 Aerial Way Drive, SW

Roanoke, VA 24018

Phone 540-343-3618

24 Hour Emergency Telephone Number: (800) 535-5053

Section 2. Hazards identification

Physical hazards: Not classified.

Health hazards:

Skin corrosion/irritation:

Category 1

Serious eye damage/eye irritation:

Category 1

Environmental hazards:

Hazardous to the aquatic environment, acute hazard

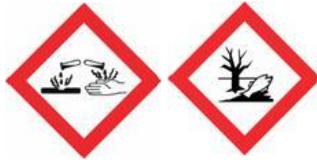
Category 1

Hazardous to the aquatic environment, long term hazard

Category 1

OSHA defined hazards: Not classified.

Label elements



Signal word: Danger

Hazard statement: Causes severe skin burns and eye damage. Causes serious eye damage. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

Precautionary statement:

Prevention: Do not breathe vapor. Wash thoroughly after handling. Avoid release to the environment. Wear eye protection/face protection. Wear protective gloves/protective clothing/eye protection/face protection.

Response: If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Wash contaminated clothing before reuse. Collect spillage.

Storage: Store locked up.

Disposal: Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC): None known.

Supplemental information: 12.45% of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 12.45% of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment.

Section 3. Composition/information on ingredients

Mixtures

Chemical Name	Common name and synonyms	CAS number	%
Hypochlorous acid, sodium salt (1:1)		7681-52-9	12.8
Sodium chloride (NaCl)		7647-14-5	11.95
Sodium hydroxide (Na(OH))		1310-73-2	1.05
Other components below reportable levels			74.2

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

Section 4. First aid measures

Inhalation: Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician or poison control center immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.

Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion: Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms/effects, acute and delayed: Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.

Indication of immediatemedical attention and special treatment needed: Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.

General information: Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

Section 5. Fire-fighting measures

Suitable extinguishing media: Powder. Foam. Carbon dioxide (CO₂).

Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical: During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters: Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions: Move containers from fire area if you can do so without risk.

Specific methods: Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards: No unusual fire or explosion hazards noted.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not breathe vapors or spray mist. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up:

Large Spills: Stop the flow of material, if this is without risk. Use water spray to reduce vapors or divert vapor cloud drift. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Prevent entry into waterways, sewer, basements or confined areas. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions: Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. Inform appropriate managerial or supervisory personnel of all environmental releases.

Section 7. Handling and storage

Precautions for safe handling: Provide adequate ventilation. Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Avoid prolonged exposure. Wear appropriate personal protective equipment. Avoid release to the environment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities: Store locked up. Store in original tightly closed container. Store away from incompatible materials (566 Section 10 of the SDS).

Section 8. Exposure controls/personal protection

Occupational exposure limits:

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Sodium hydroxide (Na(OH)) (CAS 1310-73-2)	PEL	2 mg/m ³

US ACGIH Threshold Limit Values

Components	Type	Value
Sodium hydroxide (Na(OH)) (CAS 1310-73-2)	Ceiling	2 mg/m ³

US NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Sodium hydroxide (Na(OH)) (CAS 1310-73-2)	Ceiling	2 mg/m ³

US Workplace Environmental Exposure Level (WEEL) Guides		
Components	Type	Value
Hypochlorous acid, Sodium salt (1:1) (CAS 7681-52-9)	STEL	2 mg/m ³

Biological limit values: No biological exposure limits noted for the ingredient(s)

Appropriate engineering controls: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment:

Eye/face protection: Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection:

Hand protection: Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

Other: Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection: In case of insufficient ventilation, wear suitable respiratory equipment.

Thermal hazards: Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations: Always observe good personal hygiene measures, such as washing after handling the material considerations and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Section 9. Physical and chemical properties

Appearance:

Physical state: Liquid

Form: Liquid

Color: Yellowish-green

Odor: Pungent chlorine

Odor threshold: Not available.

pH: Not available.

Melting point/freezing point: 1410.21°F (765.67°C) estimated / -20°F (-28.89°C)

Initial boiling point and boiling range: 576.73°F (303.74°C) estimated

Flash point: 999.0°F (537.2°C)

Evaporation rate: Not available.

Flammability (solid, gas): Not applicable.

Upper/lower flammability or explosive limits:

Flammability limit - lower (%): Not available.

Flammability limit - upper (%): Not available.

Explosive limit - lower (%): Not available.

Explosive limit - upper (%): Not available.
Vapor pressure: 0.09 hPa estimated
Vapor density: Not available.
Relative density: Not available.
Solubility(ies):
Solubility (water): Not available.
Partition coefficient (n-octanol/water): Not available.
Auto-ignition temperature: Not available.
Decomposition temperature: Not available.
Viscosity: Not available.
Other information:
Density: 14.23 lbs/gal estimated
Explosive properties: Not explosive.
Flammability class: Combustible III B estimated
Oxidizing properties: Not oxidizing.
Percent volatile: 73.7 % estimated
Specific gravity: 1.71 estimated

Section 10. Stability and Reactivity

Reactivity: The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability: Material is stable under normal conditions.
Possibility of hazardous reactions: Hazardous polymerization does not occur.
Conditions to avoid: Contact with incompatible materials.
Incompatible materials: Strong acids.
Hazardous decomposition products: No hazardous decomposition products are known.

Section 11. Toxicological Information

Information on likely routes of exposure:
Inhalation: May cause irritation to the respiratory system. Prolonged inhalation may be harmful.
Skin contact: Causes severe skin burns.
Eye contact: Causes serious eye damage.
Ingestion: Causes digestive tract burns.
Symptoms related to the physical, chemical and toxicological characteristics: Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.
Information on toxicological effects:
Acute toxicity: Fatal if inhaled.

Components	Species	Test Results
Hypochlorous acid, Sodium salt (1:1) (CAS 7681-52-9) Acute: Oral LC50	Mouse Rat	5800 mg/kg 8.91 g/kg
Sodium hydroxide (Na(OH))		

(CAS 1310-73-2) Acute: Oral LC50	Mouse Rat	4000 mg/kg 3000mg/kg
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* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation: Causes severe skin burns and eye damage.

Serious eye damage/eye irritation: Causes serious eye damage.

Respiratory or skin sensitization:

Respiratory sensitization: Not a respiratory sensitizer.

Skin sensitization: This product is not expected to cause skin sensitization.

Germ cell mutagenicity: No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity: This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

OSHA Specifically Regulated Substances (29 CFR1910.1001-1050): Not listed.

Reproductive toxicity: This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity- single exposure: Not classified.

Specific target organ toxicity- repeated exposure: Not classified.

Aspiration hazard: Not an aspiration hazard.

Chronic effects: Prolonged inhalation may be harmful.

Section 12. Ecological information

Ecotoxicity: Very toxic to aquatic life with long lasting effects.

Components	Species	Test Results
Hypochlorous acid, Sodium salt (1:1) (CAS 7681-52-9) Aquatic Fish, LC50	Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	0.038-0.065 mg/l, 96 hours
Sodium chloride (NaCl) (CAS 7647-14-5) Aquatic Crustacea, EC50 Fish, LC50	Water flea (<i>Daphnia magna</i>) Fathead minnow (<i>Pimephales promelas</i>)	340.7-469.2 mg/l, 48 hours 6020-7070 mg/l, 96 hours
Sodium hydroxide (Na(OH)) (CAS 1310-73-2) Aquatic Crustacea, EC50 Fish, LC50	Water flea (<i>Daphnia magna</i>) Western mosquitofish (<i>Gambusia affinis</i>)	34.59-47.13 mg/l, 48 hours 125 mg/l, 96 hours

* Estimates for product may be based on additional component data not shown.

Persistence and degradability: No data is available on the degradability of this product.

Bioaccumulative potential: No data available.

Mobility in soil: No data available.

Other adverse effects: No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

Section 13. Disposal considerations

Disposal instructions: Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations: Dispose in accordance with all applicable regulations.

Hazardous waste code: The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues/unused products: Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging: Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

Section 14. Transport information

DOT

UN number: UN1791

UN proper shipping name: Hypochlorite solutions DOT-SP 12412 (RQ=RQ)

Transport hazard class(es)

Class: 8

Subsidiary risk: -

Packing group: III

Special precautions for user: Read safety instructions, SDS and emergency procedures before handling.

ERG number: 154

DOT information on packaging may be different from that listed.

DOT



General information: IMDG Regulated Marine Pollutant

Section 15. Regulatory information

US federal regulation: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D):

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4):

HYPOCHLOROUS ACID, SODIUM Listed.

SALT (1:1) (CAS 7681-52-9)

SODIUM HYDROXIDE Listed.

(NA(OH)) (CAS 1310-73-2)

SARA 304 Emergency release notification:

Not regulated.

OSHA Specifically Regulated Substances (29 CFR1910.1001-1050):

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories:

Immediate Hazard - Yes

Delayed Hazard - No

Fire Hazard - No

Pressure Hazard - No

Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical: No

SARA 313 (TRI reporting):

Not regulated.

Other federal regulations:

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA):

Not regulated.

US state regulations

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100):

Not listed.

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs. tit. 22. 69502.3. subd. (a))

SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)

US. Massachusetts RTK - Substance List:

HYPOCHLOROUS ACID, SODIUM SALT (1:1) (CAS 7681-52-9)

SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)

US. New Jersey Worker and Community Right-to-Know Act

HYPOCHLOROUS ACID, SODIUM SALT (1:1) (CAS 7681-52-9)

SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)

US. Pennsylvania Worker and Community Right-to-Know Law:

HYPOCHLOROUS ACID, SODIUM SALT (1:1) (CAS 7681-52-9)

SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)

US. Rhode Island RTK:

HYPOCHLOROUS ACID, SODIUM SALT (1:1) (CAS 7681-52-9)

SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)

US. California Proposition 65:

California Safe Drinking Water and Toxic Enforcement Act of 1986
 (Proposition 65): This material is not known to contain any chemicals
 currently listed as carcinogens or reproductive toxins.

International inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Canada Domestic Substances List (DSL)	Yes
Canada	Canada Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Yes Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s). A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing Country(s).

Section 16. Other information

HMIS® ratings:

Health: 3
 Flammability: 0
 Physical hazard: 0

NFPA ratings:

Health: 3
 Flammability: 0
 Instability: 0

The information herein is believed to be reliable. However, no warranty, expressed or implied, is made as to its accuracy or completeness and none is made as to the fitness of this material for any purpose. The manufacturer/supplier shall not be liable for damages to person or property resulting from its use. Nothing herein shall be construed as a recommendation for use in violation of any patent.

Preparation date: 6/1/2015



MICRO-BIOCIDE BR-2

POST OFFICE BOX 4273 • ROANOKE, VIRGINIA 24015 • TELEPHONE (540) 343-3618

ACTIVE INGREDIENTS:

Sodium hypochlorite	7.45%
Sodium bromide	10.28%
Inert Ingredients	82.27%
TOTAL	100.00%

Total Available bromine = approximately 16%
Total Available chlorine = approximately 7 %

DIRECTIONS FOR USE:

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

Basic Guidelines: As a general rule, the total bromine level should be checked with a chlorine or bromine test kit at the bleed-off point furthest from the point of injection. This product is UV light sensitive, and may be applied at nighttime in most systems if excessive exposure may be a limiting factor. Do not store product in clear or transparent containers.

Initial dose: When the system is noticeably fouled, a precleaning may be necessary. Then apply sufficient Microbiocide BR-2 to achieve 2.4-15 ppm total bromine (1-6.6 ppm as chlorine) or as needed to maintain microbial or algal control.

Subsequent doses: This product may be added using continuous or intermittent dosing methods to provide adequate control. Continuous addition methods may obtain adequate control at lower total bromine levels than suggested above. Always adjust levels of total bromine accordingly to maintain desired visual or measured microbiological control.

INDUSTRIAL RECIRCULATING COOLING WATER, HEAT TRANSFER SYSTEMS and PASTEURIZERS

(Such as Evaporative Condensers, Hydrostatic Sterilizers and Retorts, Dairy Sweetwater Systems, Food and Beverage Pasteurizers and Once-Through Cooling Water Systems)

Microbiocide BR-2 should be applied directly to the cooling water at any section of the system where sufficient mixing will occur. This product should be applied to the cooling water to provide a total bromine level of 1.0-15 ppm. Microbiocide BR-2 added at a rate of two fluid ounces per 1000 gallons of water gives a dosage of approximately 3.4 ppm of total bromine, but higher dosages may occasionally be required to provide the desired bromine level throughout the systems. The total bromine level should be checked with a test kit and additional product applied until a reading of 1.0-15 ppm is obtained at the bleed-off point. Some systems may be maintained in satisfactory biological condition by applying this dosage once per day while others will respond better to dosages less than once per day. Some systems may be maintained in satisfactory biological condition by applying this dosage intermittently while others may require a continuous application.

NOTE: Halogen dosages listed in the various applications are expressed as bromine. Since most field test kits for oxidizing halogens give values in terms of chlorine, simply multiply the reading from the test kit (as chlorine) by 2.25 in order to obtain the bromine equivalency listed in these directions.

KEEP OUT OF REACH OF CHILDREN DANGER

FIRST AID	
If in eyes:	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. • Call a poison control center or doctor for treatment advice.
If on skin or clothing:	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If swallowed:	<ul style="list-style-type: none"> • Call a poison control center or doctor immediately for treatment advice. • DO NOT INDUCE VOMITING. • Do not give anything to drink.
If inhaled:	<ul style="list-style-type: none"> • Move to fresh air. • If person is not breathing, call 911 or an ambulance, and then give artificial respiration, preferably mouth-to-mouth if possible. • Call a poison control center or doctor immediately for treatment advice.
NOTE TO PHYSICIAN: Aspiration may cause lung damage. Probable mucosal damage may contraindicate the use of gastric lavage.	
Have the product container, label or MSDS with you when calling a poison control center or a doctor, or going for treatment.	

E.P.A. Establishment Number:
44811-VA-1; 63838-CA-1
E.P.A. Registration No. 63838-5-44811
Net Contents:

Manufactured For:
WATER CHEMISTRY, INC.
P.O. BOX 4273 ROANOKE, VA (540) 343-3618

Seller makes no warranty, expressed or implied, concerning the use of this product other than indicated on the label. Buyer assumes all risk of use and/or handling of this material, when such use and/or handling is contrary to label instructions.

24 hr Emergency ChemTrec Number: 800-424-9300

PRECAUTIONARY STATEMENTS Hazards to Humans and Domestic Animals WARNING

DANGER. CORROSIVE. Causes irreversible eye damage. Causes skin burns. Do not get in eyes, on skin or on clothing. Wear protective eyewear such as face shield or safety glasses and rubber gloves. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco. Remove and wash contaminated clothing before reuse.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish and aquatic organisms. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or public waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

STORAGE AND DISPOSAL

Store this product in a cool dry area, away from direct sunlight and heat to avoid deterioration. In case of spill, flood areas with large quantities of water. Product or rinsates that cannot be used should be diluted with water before disposal in a sanitary sewer. Do not reuse empty container but place in trash collection. Do not contaminate water, food, or feed by storage, disposal or cleaning of equipment.

PESTICIDE DISPOSAL: Pesticide disposal wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL: PLASTIC CONTAINERS: Nonrefillable container. Do not use this container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in the container. Contact your state regulatory agency to determine allowable practices in your state. Clean container promptly after emptying. Offer for recycling if available. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

Water Chemistry, Inc Microbiocide BR-2 SAFETY DATA SHEET

Section 1. Identification

Product identifier: Microbiocide BR-2
Chemical Family: Water treatment antimicrobial solution
Product code: 25
Supplier's details : Water Chemistry, Inc.
3404 Aerial Way Drive, SW
Roanoke, VA 24018
Phone 540-343-3618

24 Hour Emergency Telephone Number: (800) 535-5053

Section 2. Hazards identification

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), These requirements differ from the classification criteria and hazard information required for safety data sheets of non-pesticide chemicals. Please see Section 15 for FIFRA labeling information.

Classification of the Substance or Mixture:

- Skin Corrosion - Category 1
- Serious Eye Damage - Category 1
- Corrosive to Metals - Category 1
- Acute Toxicity - Inhalation Category 3
- Acute Toxicity - Dermal Category 5



Signal Word: DANGER

Hazard Statements:

- Causes severe skin burns and eye damage
- Causes serious eye damage
- May be corrosive to metals
- Toxic if inhaled
- May be harmful in contact with skin

Precautionary Statements:

- Wear protective gloves/protective clothing/eye protection/face protection.
- IF IN EYES:** Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
- IF ON SKIN (or hair):** Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- Keep away from heat/sparks/open flames/hot surfaces - No smoking.
- Keep/Store away from clothing/.../combustible materials.
- Take any precaution to avoid mixing with combustibles.
- Keep only in original container.

Section 3. Composition/information on ingredients

Ingredient	CAS Number	Concentration
Sulfamic acid, N-bromo, Sodium salt	1004542-84-0	20-30%
Sodium Hydroxide	1310-73-2	1-5%

Section 4. First aid measures

Inhalation: Remove source of exposure or move person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. If breathing is difficult, trained personnel should administer emergency oxygen if advised to do so by the POISON CENTER/doctor. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure. If direct contact during rescue breathing poses a threat to the first aid provider, "Avoid mouth-to-mouth contact by using a barrier device."

Skin Contact: Take off immediately contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Rinse skin with lukewarm, gently flowing water/shower with a flushing duration of 30 minutes. Immediately call POISON CENTER/doctor. Wash contaminated clothing before re-use.

Eye Contact: Remove source of exposure or move person to fresh air. Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing for 30 minutes. Take care not to rinse contaminated water into the unaffected eye or into the face. Immediately call a POISON CENTER/doctor.

Ingestion: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER/doctor. If vomiting occurs naturally, lie on your side, in the recovery position.

Most Important Symptoms and Effects, both Acute and Delayed: Causes severe skin burns and eye damage, burning of the mouth, throat, and esophagus.

Section 5. Fire-fighting measures

Extinguishing Media: Use water spray, powder, foam, carbon dioxide.

Special hazards arising from the substance or mixture: Non combustible. May give off irritating or toxic fumes (or gases) in a fire.

Flammability classification (OSHA 29 CFR 1910.106) (Hazcom 2012): Non flammable

Hazardous Combustion Products: May cause fire and explosions when in contact with incompatible materials.

Special protective equipment and precautions for firefighters: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Isolate hazard area. Keep unnecessary and unprotected personnel from entering,

Methods and materials for containment and cleaning up: SMALL SPILLS (less than 1 gallon): Neutralize with soda ash or cover with dry earth, sand or other non combustible material, place into loosely covered plastic containers for later disposal. If neutralized, material can be diluted into drain. LARGE SPILL: Restrict access to area until completion of clean up. Prevent liquid from entering sewers or waterways. Stop or reduce leak if safe to do so. Dike with inert material (sand, earth, etc.). Collect into plastic containers for disposal.

Ensure adequate decontamination of tools and equipment following clean up.

Special spill response procedures: Collect spills in plastic containers only. Prevent from entering sewers, waterways, or low areas.

Section 7. Handling and storage

Precautions for Safe Handling: Wear at least chemical resistant gloves and eye protection, face shield, and chemical resistant garments when handling, moving or using this product. Do not contaminate water, food, or feed by storage or disposal.

Conditions for Safe Storage: Store in a cool, dry, well ventilated place away from direct sunlight. Keep container closed when not in use.

Incompatible Materials: Avoid strong reducing agents, soft metals, heat and bases (unless product has been diluted to less than 1000ppm, then bases may be used to gradually adjust to a pH of less than 9).

Section 8. Exposure controls/personal protection

Ventilation and engineering measures: Forced air, local exhaust, or open air is adequate.

Respiratory Protection: In case of confined spaces or high levels encountered in the air, wear self contained breathing apparatus.

Skin Protection: Wear chemical resistant gloves and chemical resistant garments when handling, wash garments before re-use.

Eye/Face Protection: Wear chemical goggles; also wear a face shield if splashing hazard exists.

Other Protective Equipment: Eye wash facility and emergency shower should be in close proximity.

General Hygiene Conditions: Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Remove and wash contaminated clothing before re-use. Handle in accordance with good industry hygiene and safety practice.

Section 9. Physical and chemical properties

Appearance: Bright orange liquid

Odor: Chlorine like odor

pH: 12.0-13.0 (12100)

Melting/Freezing point: < 7°C / 45°F

Initial boiling point and boiling range: No information available

Flash Point: Not applicable

Flammability (solid, gas): Non flammable

Relative density: 1.42-1.46 g/mL

Solubility in Water: Complete

Decomposition temperature: No information available.

Viscosity: 15-25 cSt at 20°C / 68°F

Section 10. Stability and Reactivity

Reactivity: Reactive with oxidizing agents, reducing agents, organic materials, metals, acids and alkalis.

Chemical Stability: Stable for up to 1 year when stored under normal conditions.

Possibility of Hazardous Reactions: May react with incompatible materials.

Conditions to Avoid: Avoid contact with strong acids and oxidizers. Incompatible materials

and cold temperatures.

Incompatible Materials: Alkalis, oxidizing agents, metals, acids and organic materials.

Hazardous Decomposition Products: Nitrogen oxides, bromine and hydrobromic acid vapors.

Section 11. Toxicological Information

Information on likely routes of exposure:

Routes of entry - inhalation: YES

Routes of entry - skin & eye: YES

Routes of entry - ingestion: YES

Routes of entry - skin absorption: NO

Potential Health Effects:

Signs and symptoms of short term (acute) exposure:

Inhalation: Inhalation of the mist may produce severe irritation of respiratory tract, characterized by coughing, choking, shortness of breath, headaches, dizziness, nausea, weakness and/or drowsiness.

Ingestion: Corrosive! Swallowing causes severe burns of mouth, throat, and stomach. Severe scarring of tissue, corrosion, permanent tissue destruction and death may result. Symptoms may include severe pain, nausea, vomiting, diarrhea, shock, hemorrhaging and/or fall in blood pressure. Damage may appear days after exposure.

Skin: Corrosive! Contact with skin causes irritation or severe burns and scarring with greater exposures.

Eye: Corrosive! Causes irritation of eyes, and with greater exposures it can cause burns that may result in permanent impairment of vision, even blindness.

Potential Chronic Health Effects:

Mutagenicity: May have mutagenic and tumorigenic effects with long term exposure.

Carcinogenicity: May have carcinogenic effects with long term exposure.

Reproductive effects: May cause reproductive effects.

Sensitization to material: May cause sensitization in susceptible individuals.

Specific target organ effects: Irritating and corrosive to mucous membranes.

Medical conditions aggravated by overexposure: No information available

Toxicological data: The calculated ATE values for this mixture are:

ATE oral = > 5000 mg/kg

ATE dermal = > 2000 mg/kg

ATE inhalation (vapors) = 2.06 mg/L

Section 12. Ecological information

Ecotoxicity: May be harmful to aquatic life.

Persistence and degradability: No information available.

Bioaccumulation potential: No information available.

Mobility in soil: No information available.

Section 13. Disposal considerations

Handling for disposal: Do not contaminate water, food, or feed by storage and/or disposal. When handling refer to protective measures listed in sections 7 and 8. Empty residue from

containers, DO NOT rinse container.

Method of disposal: Dispose of in accordance with all applicable federal, state, provincial and local regulations. Contact your local, state, provincial or federal environmental agency for specific rules.

RCRA: If product becomes a waste, it does meet the criteria of a hazardous waste as defined by the US EPA, because of: Corrosivity D002

Section 14. Transport information

Certain shipping modes or package sizes may have exceptions from the transport regulations. The classification provided may not reflect those exceptions and may not apply to all shipping modes or package sizes.

Please note the GHS and DOT Standards are NOT identical and therefore can have varying classifications

US 49 CFR/DOT/IATA/IMDG Information:

UN No.: 1760

UN Proper Shipping Name: Corrosive liquid, n.o.s. (bromide salts)

Transportation hazard class(es): 8

Packing Group: III

Environmental hazards: Not a Marine Pollutant

Section 15. Regulatory information

FIFRA Classification/Typical Hazard Labeling, as outlined in EPA Label Review Manual

Hazard Data

Signal Word	DANGER
Acute Toxicity, oral	Not Classified (NC)
Acute Toxicity, dermal	Not Classified (NC)
Acute Toxicity, inhalation	Not Classified (NC)
Skin irritation/corrosion	Category I: Corrosive, Causes skin burns
Serious eye damage	Category I: Corrosive, Causes irreversible eye damage
Sensitization	Not Classified (NC)
Environmental (aquatic) toxicity	The pesticide is toxic to fish and other aquatic organisms

US Federal Information:

TSCA information: All components are listed on the TSCA inventory.

US CERCLA Reportable quantity (RQ): Non regulated material.

SARA Title III: Acute Health Hazard

Section 16. Other information

Legend:

SARA: The Superfund Amendments and Reauthorization Act

RCRA: Resource Conservation and Recovery Act

TSCA: Toxic Substances Control Act

CFR: Code of Federal Regulations

DOT: Department of Transportation

ATE: Acute Toxicity Estimate

The information herein is believed to be reliable. However, no warranty, expressed or implied, is made as to its accuracy or completeness and none is made as to the fitness of this material for any purpose. The manufacturer/supplier shall not be liable for damages to person or property resulting from its use. Nothing herein shall be construed as a recommendation for use in violation of any patent.

Preparation date: 6/1/15

MICROBIOCIDE 28-I

ACTIVE INGREDIENT(S):

5-Chloro-2-methyl-4-isothiazolin-3-one	1.11%
2-Methyl-4-isothiazolin-3-one	0.39%

INERT INGREDIENTS:	<u>98.50%</u>
TOTAL	100.00%

KEEP OUT OF REACH OF CHILDREN
DANGER PELIGRO

FIRST AID	
If in Eyes	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15–20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for further treatment advice.
If on Skin, Clothes	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15–20 minutes. • Call a poison control center or doctor for treatment advice.
If Swallowed	<ul style="list-style-type: none"> • Call poison control center or doctor immediately for treatment advice. • Have person sip a glass of water, if able to swallow. • Do not induce vomiting unless told to do so by the poison control center or doctor. • Do not give anything by mouth to an unconscious person.
If Inhaled	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth if possible. • Call a poison control center or doctor for further treatment advice.
HOT LINE NUMBER	
Have the product container or label with you when calling a Poison Control Center or doctor or going for treatment.	
NOTE TO PHYSICIAN	
Probable mucosal damage may contraindicate gastric lavage.	

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER: Corrosive. Causes eye damage and skin burns. May cause allergic skin reaction. Harmful if inhaled. Harmful if swallowed. Do not get in eyes, on skin, on clothing. Mixers, loaders and others exposed to this product must wear: long-sleeved shirt and long pants; chemical resistant gloves such as nitrile or butyl rubber; shoes plus socks; goggles and face shield; and chemical resistant apron. Discard clothing or other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly. This product may cause skin sensitization reactions in some people.

ENVIRONMENTAL HAZARDS: This pesticide is toxic to fish and wildlife. Do not discharge effluent containing this product into lakes streams, ponds, estuaries, oceans, or public waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA. Do not contaminate water by cleaning of equipment or disposal of waste. Apply this pesticide only as specified on the label.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

INDUSTRIAL RECIRCULATING WATER COOLING TOWERS: For the control of bacteria, algae and fungi, add MICROBIOCIDE 28-I microbicide to the tower basin, distribution box, or some other point to insure uniform mixing. *Initial Dose:* When the system is noticeably fouled, apply 148 to 883 ppm MICROBIOCIDE 28-I microbicide (1.26 to 7.46 pounds or 19 to 113 fluid ounces of MICROBIOCIDE 28-I per 1,000 gallons of water in the system). Repeat until control is achieved. *Subsequent Dose:* When microbial control is evident, add 35 to 219 ppm MICROBIOCIDE 28-I microbicide (0.3 to 1.86 pounds or 4.5 to 28 fluid ounces of MICROBIOCIDE 28-I per 1,000 gallons of water in the system) weekly or as needed to maintain control. Badly fouled systems must be cleaned before treatment is begun.

AIR WASH SYSTEMS: Add to the air washer sump or chill water sump, to insure uniform mixing, 35 to 883 ppm MICROBIOCIDE 28-I microbicide (0.3 to 7.46 pounds or 4.5 to 113 fluid ounces of MICROBIOCIDE 28-I per 1,000 gallons of water in the system) depending upon the severity of contamination to control bacteria, fungi, and algae which cause fouling in industrial air washer systems. **INTERMITTENT OR SLUG METHOD** – *Initial Dose:* When the system is noticeably fouled, apply 148 to 883 ppm MICROBIOCIDE 28-I microbicide (1.26 to 7.46 pounds or 19 to 113 fluid ounces of MICROBIOCIDE 28-I per 1,000 gallons of water in the system). Repeat until control is achieved. *Subsequent Dose:* When microbial control is evident, add 35 to 219 ppm MICROBIOCIDE 28-I microbicide (0.3 to 1.86 pounds or 4.5 to 28 fluid ounces of MICROBIOCIDE 28-I per 1,000 gallons of water) weekly or as needed to maintain control. **CONTINUOUS FEED METHOD** – *Initial Dose:* When the system is just noticeably fouled, apply 148 to 883 ppm MICROBIOCIDE 28-I microbicide (1.26 to 7.46 pounds or 19 to 113 fluid ounces of MICROBIOCIDE 28-I per 1,000 gallons of water in the system). *Subsequent Dose:* Maintain this treatment level by adding a continuous feed of 35 to 219 ppm MICROBIOCIDE 28-I microbicide (0.3 to 1.86 pounds or 4.5 to 28 fluid ounces of MICROBIOCIDE 28-I per 1,000 gallons of makeup water). Badly fouled systems must be cleaned before initial treatment. NOTE: For use only in industrial air washing systems that maintain effective mist eliminating components.

INDUSTRIAL RECIRCULATING CLOSED LOOP WATER COOLING SYSTEMS: For the control of bacteria, algae, and fungi, add MICROBIOCIDE 28-I microbicide to the reservoir, recirculating line, or some other point in the system to insure uniform mixing. *Initial Dose:* When the system is noticeably fouled, apply 148 to 883 ppm MICROBIOCIDE 28-I microbicide (1.26 to 7.46 pounds or 19 to 113 fluid ounces of

MICROBIOCIDE 28-I per 1,000 gallons of water in the system). Repeat until control is achieved. *Subsequent Dose:* When microbial control is evident, add 35 to 219 ppm MICROBIOCIDE 28-I microbicide (0.3 to 1.86 pounds or 4.5 to 28 fluid ounces of MICROBIOCIDE 28-I per 1,000 gallons of water in the system) weekly or as needed to maintain control. Badly fouled systems must be cleaned before treatment is begun.

REVERSE OSMOSIS SYSTEMS: MICROBIOCIDE 28-I may be used to control microbiological fouling in reverse osmosis systems used for process water and other non-potable applications. MICROBIOCIDE 28-I should be fed to the membrane feedwater at a rate of 20–120 ppm (2.75–16.5 fluid ounces per 1,000 gallons of water). The product should be added continuously for a time period of 1–24 hours, 1–7 days each week depending on the severity of the problem. For off-line cleaning, MICROBIOCIDE 28-I should be added to provide a level of 100–400 ppm (13.75–55 fluid ounces per 1,000 gallons) in the soak solution. **Not registered for this use in California.**

COMMERCIAL PHOTOPROCESSING SYSTEM PRESERVATION: MICROBIOCIDE 28-I is recommended to prevent slime formation or accumulation in filters and ion exchange resin tanks of commercial photoprocessing systems. For the maintenance of a non-fouled system, use MICROBIOCIDE 28-I at 32–64 fluid ounces (2.1 lbs.–4.2 lbs.) per 1,000 gallons water in the system once weekly, or as needed, to maintain control of slime. For a noticeably fouled system, use an initial dose of 64–154 fluid ounces (4.2 lbs.–10 lbs.) per 1,000 gallons water to be followed by subsequent maintenance dosage. A high dosage range and/or increased frequency of treatment may be required depending upon rate of dilution of preservative with makeup fluid, the nature and severity of contamination, level of control required, filtration effectiveness, system design, etc. The preservative should be dispensed into the final rinse or used water collection tank.

CONVEYOR LUBRICANTS: MICROBIOCIDE 28-I can be used to control microorganisms in water-based conveyor lubricants. MICROBIOCIDE 28-I can either be added to the lubricant concentrate or can be added to the lubricant dilution feed line using a chemical metering pump. In lubricant concentrates, MICROBIOCIDE 28-I should be added at a level that will insure a final use dilution of 200–1000 ppm of MICROBIOCIDE 28-I (3–15 ppm active). When fed to the lubricant dilution feed line, an initial metered dose of 50–126 fluid ounces of MICROBIOCIDE 28-I per 1,000 gallons of diluted conveyor lubricant is recommended until control is achieved. A subsequent metered dose of 26–126 fluid ounces per 1,000 gallons should be made to maintain 3–15 ppm active MICROBIOCIDE 28-I in the diluted conveyor lubricant. **Not registered for this use in California.**

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage and disposal.

PESTICIDE STORAGE: This product is corrosive to mild steel. Do not store or transport in unlined metal containers.

PESTICIDE DISPOSAL Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative of the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL

NONREFILLABLE CONTAINERS: Do not reuse or refill this container. Offer for recycling, if available. Triple rinse container (or equivalent) promptly after emptying. Plastic Containers: May be incinerated, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. Metal Containers: Must not be incinerated. Do not cut or weld on or near metal containers.

Liquid residue removal statement for nonrefillable containers with capacity of 5 gals or less: Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container half full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for the later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Liquid residue removal statement for nonrefillable containers with capacity of >5 gals: Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container half full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

Then offer for recycling if available or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or, if allowed by state and local authorities by burning. If burned, stay out of smoke.

Do not discharge rinsate containing this product unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge rinsate containing this product to sewer systems without prior approval from the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

GENERAL: CONSULT FEDERAL, STATE, OR LOCAL DISPOSAL AUTHORITIES FOR APPROVED ALTERNATIVE PROCEDURES.

GENERAL PRECAUTIONS AND RESTRICTIONS

Do not apply this product in a way that will contact workers or other persons.

Distributed by:



Water Chemistry, Inc.

P.O. Box 4273
 Roanoke, VA 24015
 Tel. No. (540) 343-3618

EPA Est. No. 44811-VA-1 EPA Reg. No. 1448-348-44811

Product Weight 8.4 lbs/gal 1.02 kg/L
NET CONTENTS MARKED ON CONTAINER

MIS/NPCA RATING

Health 3 Flammability 0 Reactivity 0

Batch code: _____

Rev. 9/11/2018

Water Chemistry, Inc Microbiocide 28-I SAFETY DATA SHEET

Section 1. Identification

GHS product identifier: Microbiocide 28-I

Other means of identification: Biocides

Product type: Liquid

Relevant identified uses of the substance or mixture and uses advised against

See label and/or technical data sheet, if available.

Supplier's details : Water Chemistry, Inc.

3404 Aerial Way Drive, SW

Roanoke, VA 24018

Phone 540-343-3618

24 Hour Emergency Telephone Number: (800) 535-5053

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR1910.1200).

Classification of the substance or mixture:

SKIN CORROSION/IRRITATION - Category 1B
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
SKIN SENSITIZATION - Category 1
Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 100%

GHS label elements

Hazard pictograms:



Signal word: Danger

Hazard statements: Causes severe skin burns and eye damage.
May cause an allergic skin reaction.

Precautionary statements

Prevention : Wear protective gloves. Wear eye or face protection. Wear protective clothing. Avoid breathing vapor. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Response: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove

contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

Storage: Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified: None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification: Biocides

Product Code: Microbiocide 28-I

Ingredient Name	%	CAS Number
Magnesium Nitrate	1.856-2.436	10377-60-3
5-Chloro-2methyl-4-isothiazolin-3-one	1.16-1.392	26172-55-4
2-Methyl-4-isothiazolin-3-one	0.348-0.58	2682-20-4
Nitric acid, copper(2+) sale (2:1)	0.212	3251-23-8

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

While some substances are claimed as trade secret in accordance with the provision of OSHA 29 CFR 1910.1200(i), all known hazards are clearly communicated within this document.

Per Appendix D 1919.1200 OSHA, ranges can be used when there is batch-to-batch variability in a mixture or a trade secret claim.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Section 4. First aid measures

Description of necessary first aid measures:

Eye contact :

- Hold eye open and rinse slowly and gently with water for 15-20 minutes.
- Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
- Call a poison control center or doctor for further treatment advice.

Inhalation :

- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth if possible.
- Call a poison control center or doctor for further treatment advice.

Skin contact :

- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15-20 minutes.
- Call a poison control center or doctor for treatment advice.

Ingestion :

- Call poison control center or doctor immediately for treatment advice.
- Have person sip a glass of water, if able to swallow.
- Do not induce vomiting unless told to do so by the poison control center or doctor.
- Do not give anything by mouth to an unconscious person.

Notes to physician: Probable mucosal damage may contraindicate the use of gastric lavage. See toxicological information (Section 11)

Section 5. Fire-fighting measures

Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media: None known.

Specific hazards arising from the chemical: In a fire or if heated, a pressure increase will occur and the container may burst. Fire from the chemical water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products:

Decomposition products may include the following materials:

- Carbon dioxide
- Carbon monoxide
- Nitrogen oxides
- Sulfur oxides
- Halogenated compounds
- Metals oxide/oxides

Special protective actions for fire-fighters:

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters:

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel:

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders:

If specialised clothing is required to deal with the spillage, take note of any

information in Section 8 on suitable and unsuitable materials. See also the information in "For non- emergency personnel".

Environmental precautions:

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate

containment to avoid environmental contamination.

Satisfactory Materials of Construction:

304 Stainless steel
316 Stainless steel
PVC - flexible
PVC - rigid
Polyethylene - crosslink
Polyethylene - high density
Polyethylene - low density
Polypropylene
Rehau Tubing
EPDM rubber
Butyl rubber
ABS (Plastic)
Teflon
Tygon F-4040
Tygon tubing R3603
Polyurethane Tubing
Pharmed Tubing
FRP
Norprene
Dow Sillastic Tube
Polycarbonate
Polystyrene

NOTE: With respect to all other materials not listed above, user should be aware that use of such materials with this product may be hazardous and result in damages to such materials and other property and personal injuries. No data concerning such materials not listed above should be implied by the user.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits: None

Appropriate engineering controls: If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures:

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated

clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection:

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection:

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection:

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection:

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection:

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid

Color: Green to pale yellow

Odor: Pungent [Strong]

Odor threshold: Not available

pH: 2.5 to 5

Melting point: <-3°C (<-26.6°F)

Boiling point: 100°C (212°F)

Flash point: Closed cup: >100°C (212°F) [Pensky-Martens.]

Evaporation rate: Not available

Flammability (solid, gas) : Not available

Lower and upper explosive (flammable) limits: Not available

Vapor pressure: 0.0013 kPa (0.01 mm Hg) [room temperature]

Vapor density: Not available
 Relative density: 1.01 to 1.03
 Dispersibility properties: Not available
 Solubility: Easily soluble in the following materials: cold water and hot water.
 Partition coefficient: n-octanol/water: Not available
 Auto-ignition temperature: Not available
 Decomposition temperature: Not available
 Viscosity: Dynamic (room temperature): 3 mPa·s (3 cP)
 VOC: Not available

Section 10. Stability and Reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

Chemical stability: The product is stable.

Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid: No specific data.

Incompatible materials: No specific data.

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological Information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Nitric acid, copper(2+) salt (2:1) Microbiocide 28-I	LD50 Oral	Rat	794 mg/kg	-
	LC50 Inhalation gas	Female	1.5 mg/l	4 hours
	LC50 Inhalation gas	Male	1.4 mg/l	4 hours
	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	3810 mg/kg	-

Irritation/corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Nitric acid, copper(2+) salt (2:1)	Eyes- Severe irritant	Rabbit	-	100 milligrams	-
	Eyes- Severe irritant	Rabbit	-	0.066666667 minutes 100 milligrams	-
	Skin- Severe irritant	Rabbit	-	500 milligrams	-
Microbiocide 28-I	Eyes- Severe irritant	Rabbit	-	-	-
	Skin- Severe irritant	Rat	-	-	-

Sensitization

Product/ingredient name	Route of Exposure	Species	Result
5-Chloro-2-methyl-4-isothiazolin-3-one	Skin	Guinea pig	Sensitizing
2-Methyl-4-isothiazolin-3-one	Skin	Guinea pig	Sensitizing

Mutagenicity

Not available

Carcinogenicity

The product has not been tested unless noted in summary results

Classification

Product/ingredient name	OSHA	IARC	NTP
Magnesium Nitrate	-	2A	-
Nitric acid, copper(2+) salt (2:1)	-	2A	-

Reproductive toxicity

Not available

Teratogenicity

Not available

Specific target organ toxicity (single exposure)

Not available

Specific target organ toxicity (repeated exposure)

Not available

Aspiration hazard

Not available.

Information on the likely routes of exposure:

Routes of entry anticipated: Dermal, Inhalation.

Routes of entry not anticipated: Oral.

Potential acute health effects

Eye contact: Causes serious eye damage.

Inhalation: No know significant effects or critical hazards.

Skin contact: Causes severe burns. May cause an allergic skin reaction.

Ingestion: No know significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact: Adverse symptoms may include the following: pain, watering, redness

Inhalation: No specific data.

Skin contact: Adverse symptoms may include the following: pain or irritation, redness, blistering may occur

Ingestion: Adverse symptoms may include the following: stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects: Not available
Potential delayed effects: Not available

Long term exposure

Potential immediate effects: Not available
Potential delayed effects: Not available

Potential chronic health effects

Not available

Conclusion/Summary:

The following tests were conducted with the technical grade active ingredient(s):

Ames Salmonella Assay:

Positive (T100) without activation; Negative with activation

Mouse Lymphoma Forward Mutation Assay:

Positive

Rat Bone Marrow Cytogenetics Assay:

Negative, no chromosomal damage

In Vivo Micronucleus Assay in Mice:

Negative

Sex-Linked Recessive Lethal Assay:

Negative

Teratology

Rabbits: Dose levels used were 1.5, 4.4 and 13.3 mg/kg/day. Dose related maternal toxicity was observed. No evidence of a teratogenic response, but evidence of embryotoxicity and fetotoxicity was noted.

Rats: Maternal toxicity was observed at all dose levels. No evidence of a teratogenic response at doses up to 100 mg/kg/day (highest dose tested).

90 Day Subchronic Toxicity

Oral - Rats: There was a dose related increase in adrenal weights in the females. A slight, but significant increase in SGOT was noted in the high dose (800 ppm) males. No other changes were noted.

Oral - Dogs: No treatment related effects were noted at doses up to 1500 ppm (highest dose tested).

Dermal - Rabbits: Dose levels of 100, 200 and 400 ppm active (1 ml/kg) produced dose dependent signs of dermal irritation. No treatment related signs of systemic toxicity, or changes in clinical chemistry parameters, or histopathological evaluation.

Inhalation - Rats: Exposed to levels of product at 0, 0.34, 1.15 and 2/64 mg active per cubic meter. There were no treatment related changes in hematology, gross pathology or ophthalmology. Decrease weight gains were noted in the high dose group. Histopathologic effects related to

irritation/rhinitis of the nasal cavity was noted in the mid and high dose groups. No treatment related effects were noted in the low dose group.

Metabolism

Oral - Rats: After a dosage of 2.5 mg/kg/day given for 7 days, 90% of the administered C14 was excreted in 3 days; <2% as parent compound.

Dermal - Rats: After a dosage of 0.2 - 1.6 mg/kg, 60% of the administered C14 was remained at the site of administration on the skin; whereas, 20-40% was absorbed systemically. The C14 was excreted in urine.

General: Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity: Did not cause cancer in laboratory animals.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Microbiocide 28-I	Acute IC50 0.16 mg/l	Daphnia	48 hours
	Acute LC50 0.19 mg/l	Fish	96 hours
	Acute LC50 0.28 mg/l	Fish	96 hours
	Acute LC50 0.3 mg/l	Fish	96 hours
	Acute LC50 0.55 mg/l	Fish	96 hours
	Acute LC50 1.9 mg/l	Fish	96 hours

Section 13. Disposal considerations

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and Contact with soil, waterways, drains and sewers.

RCRA classification: D002, 100 lbs.

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN Number	3265	3265	3265
UN proper shipping name	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (5-Chloro-2-methyl-4-isothiazolin-3-one, 2-Methyl-4-isothiazolin-3-one) RQ (copper dinitrate)	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (5-Chloro-2-methyl-4-isothiazolin-3-one, 2-Methyl-4-isothiazolin-3-one) Marine pollutant (5-Chloro-2-methyl-4-isothiazolin-3-one, 2-Methyl-4-isothiazolin-3-one)	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (5-Chloro-2-methyl-4-isothiazolin-3-one, 2-Methyl-4-isothiazolin-3-one)
Transport hazard class(es)	8 	8 	8 
Packing Group	II	II	II
Environmental hazards	No	Yes	No
Additional information	Reportable quantity 47169.8 lbs/21415.1 kg [5546.3 gal/20995.2 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements. Remarks ERG Guide 153	The marine pollutant mark is not require when transported in sizes of ≤5 L or 5 kg. Emergency schedules (EmS) F-A, S-B Remarks ERG Guide 153, HazMat Code 4931466	The environmentally hazardous substance mark may appear if required by other transportation regulations. Remarks ERG Guide 153, ERG Code 8L

Special precautions for user : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not available

Section 15. Regulatory information

Potential impurities present in trace quantities are included in the regulatory listings of this section.

U.S. Federal regulations:

TSCA 12(b) one-time export: 5-chloro-2-methyl-2H-isothiazol-3-one

United States inventory (TSCA 8b): This product is subject to regulation under the US Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and is therefore exempt from US Toxic Substances Control Act (TSCA) Inventory listing requirements.

Clean Water Act (CWA) 307: copper dinitrate

Clean Water Act (CWA) 307: copper dinitrate, nitric acid

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
Nitric acid	0.02	Yes	1000	85.7	1000	85.7

SARA 304 RQ: 5000000 lbs/2270000 kg [587912.3 gal/2225490.2 L]

SARA 311/312

Classification: Immediate (acute) health hazard

Composition/information on ingredients

Name	%	Fire Hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Magnesium Nitrate	1.856-2.436	No	No	No	No	Yes
5-Chloro-2methyl-4-isothiazolin-3-one	1.16-1.392	No	No	No	Yes	No
2-Methyl-4-isothiazolin-3-one	0.348-0.58	No	No	No	Yes	No
Nitric acid, copper(2+) salt (2:1)	0.212	No	No	No	Yes	Yes

SARA 313

	Product Name	CAS number	%
Form R-Reporting Requirements	Magnesium Nitrate	10377-60-3	1.856-2.436
Supplier notification	Magnesium Nitrate	10377-30-3	1.856-2.436

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

CERCLA: CERCLA: Hazardous substances: nitric acid; copper dinitrate: 100 lbs. (45.4 kg);

FDA: This product is allowed under the following FDA (21 CFR) sections :175.105 -

Limitation: For use only as an antimicrobial agent in polymer latex emulsions. / 175.300,

175.320 - Limitation: For use only as an antimicrobial agent in emulsion-based silicon

coatings at a level not to exceed 50 mg active ingredient/Kg in the coating formulation. I

176.170, 176.180 - Limitations: For use only 1) as an antimicrobial agent for polymer latex

emulsions in paper coatings at a level not to exceed 50 ppm active ingredient in the coating

formulation and 2) as an antimicrobial agent for finished coatings and for additives used in

the manufacture of paper and paperboard including fillers, binders, pigment slurries, and

sizing solutions at a level not to exceed 25 ppm active ingredient in the coating formulations

and additives. / 176.300 - Limitation: Not to exceed 2.5 pounds per ton of dry weight fiber.

BfR: XIV, XXXVI, XXXVI/1

EPA Reg. No.: 1448-384

FIFRA: This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

DANGER: Corrosive. Causes eye damage and skin burns. May cause allergic skin reaction. Harmful if inhaled. Harmful if swallowed. Do not get in eyes, on skin, on

clothing. Mixers, loaders and others exposed to this product must wear: long-sleeved shirt and long pants; chemical resistant gloves such as nitrile or butyl rubber; shoes plus socks; goggles and face shield; and chemical resistant apron. Discard clothing or other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exists use detergent and hot water. Keep and wash PPE separately from other laundry. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly. This product may cause skin sensitization reactions in some people.

ENVIRONMENTAL HAZARDS: This pesticide is toxic to fish and wildlife. Do not discharge effluent containing this product into lakes streams, ponds, estuaries, oceans, or public waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA. Do not contaminate water by cleaning of equipment or disposal of waste. Apply this pesticide only as specified on the label.

Section 16. Other information

Hazardous Material Information System (U.S.A)

Health 3

Flammability 0

Physical hazards 0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Health 3

Flammability 0

Instability/Reactivity 0

Special 0

Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

History

Date of printing: 6/1/2015

Date of issue/Date of revision: 6/1/2015

Date of previous issue: No previous validation

Version: 1

Prepared by: Water Chemistry, Inc.

Key to abbreviations:

ATE = Acute Toxicity Estimate

BCF = Bioconcentration Factor

GHS = Globally Harmonized System of Classification and Labelling of Chemicals

IATA = International Air Transport Association

IBC = Intermediate Bulk Container

IMDG = International Maritime Dangerous Goods

LogPow = logarithm of the octanol/water partition coefficient

MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpo|" = marine pollution)

UN = United Nations

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Water Chemistry, Inc. warrants that this product conforms to its chemical description and is reasonably fit for the purpose referred to in the directions for use when used in accordance with the directions under normal conditions. Buyer assumes the risk of any use outside of such directions.

Seller makes no other warranty or representation of any kind, express or implied, concerning the product, including NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS OF THE GOODS FOR ANY OTHER PARTICULAR PURPOSE. No such warranties shall be implied by law and no agent of seller is authorized to alter this warranty in any way except in writing with a specific reference to this warranty. The exclusive remedy against seller shall be in a claim for damages not to exceed the purchase price of the product, without regard to whether such a claim is based upon breach of warranty or tort.

Any controversy or claim arising out or relating to this contract, or breach thereof, shall be settled by arbitration in accordance with the commercial arbitration rules of the American Arbitration Association, and judgment upon the rendered by the Arbitrator(s) may be entered in any court having jurisdiction thereof.



Request for Proposal

RFP# MPM-1195

**Water Treatment & Services for
Cooling Towers, Boilers & Related Equipment**

September 25, 2023



REQUEST FOR PROPOSAL
RFP# MPM-1195

Issue Date: September 25, 2023
Title: Water Treatment & Services for Cooling Towers, Boilers, and Related Equipment
Issuing Agency: Commonwealth of Virginia
James Madison University
Procurement Services MSC 5720
752 Ott Street, Wine Price Building
First Floor, Suite 1023
Harrisonburg, VA 22807

Period of Contract: From Date of Award Through One Year (Renewable)

Sealed Proposals Will Be Received Until 2:00 PM on October 25, 2023 for Furnishing The Services Described Herein.

MANDATORY/ OPTIONAL PRE-PROPOSAL: None

SEALED PROPOSALS MAY BE MAILED, EXPRESS MAILED, OR HAND DELIVERED DIRECTLY TO THE ISSUING AGENCY SHOWN ABOVE.

All Inquiries For Information And Clarification Should Be Directed To: Michael Morrison, Buyer Senior, Procurement Services, morrismp@jmu.edu; 540-568-6181; (Fax) 540-568-7935 not later than five business days before the proposal closing date.

NOTE: THE SIGNED PROPOSAL AND ALL ATTACHMENTS SHALL BE RETURNED.

In compliance with this Request for Proposal and to all the conditions imposed herein, the undersigned offers and agrees to furnish the goods/services in accordance with the attached signed proposal or as mutually agreed upon by subsequent negotiation.

Name and Address of Firm:

By: _____
(Signature in Ink)

Name: _____
(Please Print)

Date: _____

Title: _____

Web Address: _____

Phone: _____

Email: _____

Fax #: _____

ACKNOWLEDGE RECEIPT OF ADDENDUM: #1 _____ #2 _____ #3 _____ #4 _____ #5 _____ (please initial)

SMALL, WOMAN OR MINORITY OWNED BUSINESS:

YES; NO; *IF YES* ⇒⇒ SMALL; WOMAN; MINORITY ***IF MINORITY:*** AA; HA; AsA; NW; Micro

Note: This public body does not discriminate against faith-based organizations in accordance with the Code of Virginia, § 2.2-4343.1 or against an offeror because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment.

REQUEST FOR PROPOSAL

RFP # MPM-1195

TABLE OF CONTENTS

I.	PURPOSE	Page	1
II.	BACKGROUND	Page	1
III.	SMALL, WOMAN-OWNED, AND MINORITY PARTICIPATION	Page	1
IV.	STATEMENT OF NEEDS	Page	1
V.	PROPOSAL PREPARATION AND SUBMISSION	Page	5
VI.	EVALUATION AND AWARD CRITERIA	Page	7
VII.	GENERAL TERMS AND CONDITIONS	Page	8
VIII.	SPECIAL TERMS AND CONDITIONS	Page	15
IX.	METHOD OF PAYMENT	Page	20
X.	PRICING SCHEDULE	Page	20
XI.	ATTACHMENTS	Page	21
	A. Offeror Data Sheet		
	B. SWaM Utilization Plan		
	C. Sample of Standard Contract		
	D. Zone Map		

I. PURPOSE

The purpose of this Request for Proposal (RFP) is to solicit sealed proposals from qualified sources to enter into a contract to provide water treatment and related services for cooling towers, boilers, and other related equipment as well as open- and closed-loop water systems on a monthly/quarterly basis for James Madison University (JMU), an agency of the Commonwealth of Virginia. Initial contract shall be for one (1) year with an option to renew for nine (9) additional one-year periods.

II. BACKGROUND

James Madison University (JMU) is a comprehensive public institution in Harrisonburg, Virginia with an enrollment of nearly 22,000 students and over 4,000 faculty and staff. There are over 600 individual departments on campus that support seven academic divisions. The University offers over 120 majors, minors, and concentrations. Further information about the University may be found at the following website: <http://www.jmu.edu>.

III. SMALL, WOMAN-OWNED AND MINORITY PARTICIPATION

It is the policy of the Commonwealth of Virginia to contribute to the establishment, preservation, and strengthening of small businesses and businesses owned by women and minorities, and to encourage their participation in State procurement activities. The Commonwealth encourages contractors to provide for the participation of small businesses and businesses owned by women and minorities through partnerships, joint ventures, subcontracts, and other contractual opportunities. Attachment B contains information on reporting spend data with subcontractors.

IV. STATEMENT OF NEEDS

- A. Contractor shall furnish all labor, materials, chemicals, equipment maintenance, supervision and related incidental work to provide proper water treatment for cooling tower systems, boilers systems, related equipment and opened and closed loop systems to keep them free of scale, corrosion and other associated water problems.
1. Service activities include but are not limited to the following:
 - Technical support
 - Recommendations for treatments
 - Inspections
 - Testing of water samples
 - Maintenance to chemical pumping systems
 - Products support
 - Products to be used in water treatment program
 - Equipment to be used in water treatment program
 - Informal training to review equipment operation and controls
 2. Contractor shall have technically qualified staff with a minimum of 5 years HVAC water treatment experience and must be capable of, or contract, an independent laboratory to analyze water samples in accordance to all federal, state and local regulations.
 3. All chemicals, other materials or devices, and their method of use shall conform to federal, state, and local ordinances and laws. The contractor shall provide Safety Data Sheets (SDS) for all hazardous products to be used at each work site prior to their delivery and use at the facility.

4. Contractor shall take necessary precautions in the use of chemicals for both water treatment and any chemical cleaning of machinery or equipment to obviate the possibility of accidents. The contractor shall be responsible for any hazardous waste created from the treatment or cleaning process.
5. Chemicals and other materials or devices used in the water treatment shall not be capable of damaging in any manner, the internal workings of the equipment being serviced when utilized per manufacturer's recommendations.
6. Contractor shall provide testing of all glycol systems and provide recommendations.
7. Contractor shall fully utilize until depleted existing chemicals that are on site at each facility and may be responsible for removing containers when empty on a case by case basis.
8. Contractor shall have all required certifications for requested services. All contractor service and direct supervisory staff shall have a minimum BS degree in Engineering or the Sciences and a minimum 1 year experience as OSHA 30 Construction certified. A brief resume of all related service and supervisory staff showing all needed required certifications shall be included in the proposal.
9. Contractor shall perform work during 7:30 AM – 4:00 PM, Monday thru Friday.
10. At times this contract may require emergency responses. Emergency response time shall be within forty-eight (48) hours of notification of the emergency.
11. As non-capital and capital construction projects arise, contractor will be responsible for working with Facilities Management's (FM) Facilities Planning & Construction and FM's Engineering Department, as well as their general contractor, to provide services as stated in this solicitation. Upon end of warranty, contractor will continue to service these buildings on a normal monthly/quarterly basis as determined by FM's HVAC Shop.

B. Project Record Documents

1. Test analysis and inspections shall be to current industry standards and be performed during each service call by the contractor. Written reports of results of each system test will be submitted to Facilities Management, HVAC Shop / Power Plant / OB Shop as appropriate. These reports will include as a minimum the following:
 - System name / location / equipment identifier
 - pH (Condensate, Condensers & Chilled Water)
 - Test conducted including actual results and a list of expected normal results
 - Inhibiter levels
 - Freeze protection for glycol level
 - Conductivity (Raw Water, Softeners, DA Feedwater, Boilers, Condensate, Condensers, & Chilled Water)
 - Total Hardness (Raw Water, Softeners, DA Feedwater, Condensate & Condensers)
 - Phenol Alkalinity (Boilers)
 - Total Alkalinity (Boilers & Condensers)
 - Hydrate Alkalinity (Boilers)

- Sodium Sulfate (Boilers)
- Ortho Phosphate (Boilers)
- Sodium Nitrate (Chilled Water)
- Free Bromine (Condensers)
- Stability Index (Condensers)
- Post-treatment test results as applicable
- Comments and recommendations

2. At the day of service, contractor shall generate a complete set of reports and deliver them to FM's HVAC / Power Plant / Oil Burner Shop as appropriate.

C. Equipment Replacement/Installation

1. Items requiring replacement or new installation shall be performed per manufacturers' recommendations. All work shall be approved by FM's HVAC / Power Plant / Oil Burner Shop personnel as appropriate prior to any work being performed.
2. All new and existing electrical connections shall be to existing code requirements.

D. Monthly and Quarterly Inspection Services

1. On a monthly basis, contractor shall perform water testing on all cooling towers, and boiler systems.
2. On a monthly basis, contractor shall perform site inspection visits on cooling towers, boiler systems and associated dosing stations. Inspection services at each site will include but not limited to, inspecting the equipment to assess proper functioning and perform all analysis required determining that the water treatment program is operating at optimum performance. Contractor shall submit service report to FM's HVAC / Power Plant / Oil Burner Shop as appropriate.
3. On a quarterly basis, contractor shall provide water testing sample bottles of all closed loops and towers and perform system testing on site.

E. Cooling Tower Systems

1. Contractor shall provide a suitable amount of corrosion inhibitor material for two months treatment for the open side of the cooling towers/evaporative condenser for prevention of corrosion and mud fouling. This material shall contain no heavy metals, but should contain sequestrants, polymeric dispersants, and corrosion inhibitors for both ferrous and non-ferrous metals. The materials shall be capable of preventing accumulation of metal oxides, mineral scale and silt. The materials shall be stable to oxidizers. Product must be acceptable to the State Water Control Board for discharge. The towers and related controls utilize three different inhibitors, one with a clear optical tracing compound, one with a blue optical tracing compound, and one with no tracing compound. The contractor shall provide and show experience with all these products that must work with existing controls for program operation.
2. Contractor shall provide a biocide material for prevention of biological fouling in the same cooling tower/evaporative condenser as stated in paragraph E.1. This material shall be compatible with the compound in paragraph E.1. and shall also be acceptable for discharge. The biocides shall be both non-oxidizing and oxidizing.

3. The method for injecting chemicals shall be compatible with existing equipment at each site.
4. Contractor shall furnish a copy of the drum label and OSHA Safety Data Sheet for each item.

F. Closed-Loop Systems

1. Contractor shall provide a treatment for the prevention of corrosion in the hot/chilled closed loop systems at each site. Majority of closed systems utilize sodium nitrite based inhibitors. This material shall be nontoxic on exposure to air.
2. If necessary to drain and flush closed-loop systems at sites, the removal of treated water shall be done by the contractor in a manner which meets all Environmental Protection Agency (EPA) standards.

G. Open-Loop Systems

1. If necessary to drain and flush open-loop systems at sites, the removal of non-hazardous water shall be done by the contractor in a manner which meets all Environmental Protection Agency (EPA) standards and local and state regulations for discharge to open streams

H. Cleaning

1. Contractor shall maintain the buildings work areas in a clean and safe environment.
2. Contractor will not allow the accumulation of scraps, debris, waste material or other items not required for chemical treatment.
3. Maintain the job site in a neat and orderly condition at all times.

I. Boilers

1. Contractor shall provide a Molybdate based treatment program for Aluminum based boilers that maintains the operating system within the manufacturers design pH and inhibitor ranges for Aluminum based systems.
2. Contractor shall provide a comprehensive treatment program, typically phosphate, polymer, alkalinity, and sodium sulfite for steam producing boilers to minimize scale, corrosion and deposits and should minimize the accumulation of debris within the boiler vessel. The program shall include necessary oxygen scavengers, dispersants, sequestrants and blended condensate treatments to minimize system operational issues.
3. Steam boilers shall have monthly services. Hot water boilers shall have quarterly services.

V. PROPOSAL PREPARATION AND SUBMISSION

A. GENERAL INSTRUCTIONS

To ensure timely and adequate consideration of your proposal, offerors are to limit all contact, whether verbal or written, pertaining to this RFP to the James Madison University Procurement Office for the duration of this Proposal process. Failure to do so may jeopardize further consideration of Offeror's proposal.

1. RFP Response: In order to be considered for selection, the **Offeror shall submit a complete response to this RFP**; and shall submit to the issuing Purchasing Agency:
 - a. **One (1) original and two (2) copies** of the entire proposal, INCLUDING ALL ATTACHMENTS. Any proprietary information should be clearly marked in accordance with 3.f. below.
 - b. **One (1) electronic copy in WORD format or searchable PDF (CD or flash drive)** of the entire proposal, INCLUDING ALL ATTACHMENTS. Any proprietary information should be clearly marked in accordance with 3.f. below.
 - c. Should the proposal contain **proprietary information**, provide **one (1) redacted hard copy** of the proposal and all attachments with **proprietary portions removed or blacked out**. This copy should be clearly marked "*Redacted Copy*" on the front cover. The classification of an entire proposal document, line item prices, and/or total proposal prices as proprietary or trade secrets is not acceptable. JMU shall not be responsible for the Contractor's failure to exclude proprietary information from this redacted copy.

No other distribution of the proposal shall be made by the Offeror.

2. The version of the solicitation issued by JMU Procurement Services, as amended by an addenda, is the mandatory controlling version of the document. Any modification of, or additions to, the solicitation by the Offeror shall not modify the official version of the solicitation issued by JMU Procurement services unless accepted in writing by the University. Such modifications or additions to the solicitation by the Offeror may be cause for rejection of the proposal; however, JMU reserves the right to decide, on a case-by-case basis in its sole discretion, whether to reject such a proposal. If the modification or additions are not identified until after the award of the contract, the controlling version of the solicitation document shall still be the official state form issued by Procurement Services.
3. Proposal Preparation
 - a. Proposals shall be signed by an authorized representative of the Offeror. All information requested should be submitted. Failure to submit all information requested may result in the purchasing agency requiring prompt submissions of missing information and/or giving a lowered evaluation of the proposal. Proposals which are substantially incomplete or lack key information may be rejected by the purchasing agency. Mandatory requirements are those required by law or regulation or are such that they cannot be waived and are not subject to negotiation.

- b. Proposals shall be prepared simply and economically, providing a straightforward, concise description of capabilities to satisfy the requirements of the RFP. Emphasis should be placed on completeness and clarity of content.
 - c. Proposals should be organized in the order in which the requirements are presented in the RFP. All pages of the proposal should be numbered. Each paragraph in the proposal should reference the paragraph number of the corresponding section of the RFP. It is also helpful to cite the paragraph number, sub letter, and repeat the text of the requirement as it appears in the RFP. If a response covers more than one page, the paragraph number and sub letter should be repeated at the top of the next page. The proposal should contain a table of contents which cross references the RFP requirements. Information which the offeror desires to present that does not fall within any of the requirements of the RFP should be inserted at the appropriate place or be attached at the end of the proposal and designated as additional material. Proposals that are not organized in this manner risk elimination from consideration if the evaluators are unable to find where the RFP requirements are specifically addressed.
 - d. As used in this RFP, the terms “must”, “shall”, “should” and “may” identify the criticality of requirements. “Must” and “shall” identify requirements whose absence will have a major negative impact on the suitability of the proposed solution. Items labeled as “should” or “may” are highly desirable, although their absence will not have a large impact and would be useful, but are not necessary. Depending on the overall response to the RFP, some individual “must” and “shall” items may not be fully satisfied, but it is the intent to satisfy most, if not all, “must” and “shall” requirements. The inability of an offeror to satisfy a “must” or “shall” requirement does not automatically remove that offeror from consideration; however, it may seriously affect the overall rating of the offeror’s proposal.
 - e. Each copy of the proposal should be bound or contained in a single volume where practical. All documentation submitted with the proposal should be contained in that single volume.
 - f. Ownership of all data, materials and documentation originated and prepared for the State pursuant to the RFP shall belong exclusively to the State and be subject to public inspection in accordance with the Virginia Freedom of Information Act. Trade secrets or proprietary information submitted by the offeror shall not be subject to public disclosure under the Virginia Freedom of Information Act; however, the offeror must invoke the protection of Section 2.2-4342F of the Code of Virginia, in writing, either before or at the time the data is submitted. The written notice must specifically identify the data or materials to be protected and state the reasons why protection is necessary. The proprietary or trade secret materials submitted must be identified by some distinct method such as highlighting or underlining and must indicate only the specific words, figures, or paragraphs that constitute trade secret or proprietary information. The classification of an entire proposal document, line item prices and/or total proposal prices as proprietary or trade secrets is not acceptable and will result in rejection and return of the proposal.
4. Oral Presentation: Offerors who submit a proposal in response to this RFP may be required to give an oral presentation of their proposal to James Madison University. This provides an opportunity for the Offeror to clarify or elaborate on the proposal. This is a fact-finding and explanation session only and does not include negotiation. James Madison University will schedule the time and location of these presentations. Oral presentations are an option

of the University and may or may not be conducted. Therefore, proposals should be complete.

B. SPECIFIC PROPOSAL INSTRUCTIONS

Proposals should be as thorough and detailed as possible so that James Madison University may properly evaluate your capabilities to provide the required services. Offerors are required to submit the following items as a complete proposal:

1. Return RFP cover sheet and all addenda acknowledgements, if any, signed and filled out as required.
2. Plan and methodology for providing the goods/services as described in Section IV. Statement of Needs of this Request for Proposal.
3. A written narrative statement to include, but not be limited to, the expertise, qualifications, and experience of the firm and resumes of specific personnel to be assigned to perform the work.
4. Offeror Data Sheet, included as *Attachment A* to this RFP.
5. Small Business Subcontracting Plan, included as *Attachment B* to this RFP. Offeror shall provide a Small Business Subcontracting plan which summarizes the planned utilization of Department of Small Business and Supplier Diversity (SBSD)-certified small businesses which include businesses owned by women and minorities, when they have received Department of Small Business and Supplier Diversity (SBSD) small business certification, under the contract to be awarded as a result of this solicitation. This is a requirement for all prime contracts in excess of \$100,000 unless no subcontracting opportunities exist.
6. Identify the amount of sales your company had during the last twelve months with each VASCUPP Member Institution. A list of VASCUPP Members can be found at: www.VASCUPP.org.
7. Proposed Cost. See Section X. Pricing Schedule of this Request for Proposal.

VI. EVALUATION AND AWARD CRITERIA

A. EVALUATION CRITERIA

Proposals shall be evaluated by James Madison University using the following criteria:

	<u>Points</u>
1. Quality of products/services offered and suitability for intended purposes	30
2. Qualifications and experience of Offeror in providing the goods/services	30
3. Specific plans or methodology to be used to perform the services	10
4. Participation of Small, Women-Owned, & Minority (SWaM) Businesses	10
5. Cost	20
	<hr style="width: 100%; border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> 100

- B. AWARD TO MULTIPLE OFFERORS: Selection shall be made of two or more offerors deemed to be fully qualified and best suited among those submitting proposals on the basis of the evaluation factors included in the Request for Proposals, including price, if so stated in the Request for Proposals. Negotiations shall be conducted with the offerors so selected. Price shall be considered, but need not be the sole determining factor. After negotiations have been conducted with each offeror so selected, the agency shall select the offeror which, in its opinion, has made the best proposal, and shall award the contract to that offeror. The Commonwealth reserves the right to make multiple awards as a result of this solicitation. The Commonwealth may cancel this Request for Proposals or reject proposals at any time prior to an award, and is not required to furnish a statement of the reasons why a particular proposal was not deemed to be the most advantageous. Should the Commonwealth determine in writing and in its sole discretion that only one offeror is fully qualified, or that one offeror is clearly more highly qualified than the others under consideration, a contract may be negotiated and awarded to that offeror. The award document will be a contract incorporating by reference all the requirements, terms and conditions of the solicitation and the contractor's proposal as negotiated.

VII. GENERAL TERMS AND CONDITIONS

- A. PURCHASING MANUAL: This solicitation is subject to the provisions of the Commonwealth of Virginia's Purchasing Manual for Institutions of Higher Education and Their Vendors and any revisions thereto, which are hereby incorporated into this contract in their entirety. A copy of the manual is available for review at the purchasing office. In addition, the manual may be accessed electronically at <http://www.jmu.edu/procurement> or a copy can be obtained by calling Procurement Services at (540) 568-3145.
- B. APPLICABLE LAWS AND COURTS: This solicitation and any resulting contract shall be governed in all respects by the laws of the Commonwealth of Virginia and any litigation with respect thereto shall be brought in the courts of the Commonwealth. The Contractor shall comply with applicable federal, state and local laws and regulations.
- C. ANTI-DISCRIMINATION: By submitting their proposals, offerors certify to the Commonwealth that they will conform to the provisions of the Federal Civil Rights Act of 1964, as amended, as well as the Virginia Fair Employment Contracting Act of 1975, as amended, where applicable, the Virginians With Disabilities Act, the Americans With Disabilities Act and §10 of the Rules Governing Procurement, Chapter 2, Exhibit J, Attachment 1 (available for review at <http://www.jmu.edu/procurement>). If the award is made to a faith-based organization, the organization shall not discriminate against any recipient of goods, services, or disbursements made pursuant to the contract on the basis of the recipient's religion, religious belief, refusal to participate in a religious practice, or on the basis of race, age, color, gender, sexual orientation, gender identity, or national origin and shall be subject to the same rules as other organizations that contract with public bodies to account for the use of the funds provided; however, if the faith-based organization segregates public funds into separate accounts, only the accounts and programs funded with public funds shall be subject to audit by the public body. (*§6 of the Rules Governing Procurement*).

In every contract over \$10,000 the provisions in 1. and 2. below apply:

1. During the performance of this contract, the contractor agrees as follows:

- a. The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, sexual orientation, gender identity, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
 - b. The contractor, in all solicitations or advertisements for employees placed by or on behalf of the contractor, will state that such contractor is an equal opportunity employer.
 - c. Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting these requirements.
2. The contractor will include the provisions of 1. above in every subcontract or purchase order over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.
- D. ETHICS IN PUBLIC CONTRACTING: By submitting their proposals, offerors certify that their proposals are made without collusion or fraud and that they have not offered or received any kickbacks or inducements from any other offeror, supplier, manufacturer or subcontractor in connection with their proposal, and that they have not conferred on any public employee having official responsibility for this procurement transaction any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value was exchanged.
- E. IMMIGRATION REFORM AND CONTROL ACT OF 1986: By entering into a written contract with the Commonwealth of Virginia, the Contractor certifies that the Contractor does not, and shall not during the performance of the contract for goods and services in the Commonwealth, knowingly employ an unauthorized alien as defined in the federal Immigration Reform and Control Act of 1986.
- F. DEBARMENT STATUS: By submitting their proposals, offerors certify that they are not currently debarred by the Commonwealth of Virginia from submitting proposals on contracts for the type of goods and/or services covered by this solicitation, nor are they an agent of any person or entity that is currently so debarred.
- G. ANTITRUST: By entering into a contract, the contractor conveys, sells, assigns, and transfers to the Commonwealth of Virginia all rights, title and interest in and to all causes of action it may now have or hereafter acquire under the antitrust laws of the United States and the Commonwealth of Virginia, relating to the particular goods or services purchased or acquired by the Commonwealth of Virginia under said contract.
- H. MANDATORY USE OF STATE FORM AND TERMS AND CONDITIONS RFPs: Failure to submit a proposal on the official state form provided for that purpose may be a cause for rejection of the proposal. Modification of or additions to the General Terms and Conditions of the solicitation may be cause for rejection of the proposal; however, the Commonwealth reserves the right to decide, on a case by case basis, in its sole discretion, whether to reject such a proposal.
- I. CLARIFICATION OF TERMS: If any prospective offeror has questions about the specifications or other solicitation documents, the prospective offeror should contact the buyer

whose name appears on the face of the solicitation no later than five working days before the due date. Any revisions to the solicitation will be made only by addendum issued by the buyer.

J. PAYMENT:

1. To Prime Contractor:

- a. Invoices for items ordered, delivered and accepted shall be submitted by the contractor directly to the payment address shown on the purchase order/contract. All invoices shall show the state contract number and/or purchase order number; social security number (for individual contractors) or the federal employer identification number (for proprietorships, partnerships, and corporations).
- b. Any payment terms requiring payment in less than 30 days will be regarded as requiring payment 30 days after invoice or delivery, whichever occurs last. This shall not affect offers of discounts for payment in less than 30 days, however.
- c. All goods or services provided under this contract or purchase order, that are to be paid for with public funds, shall be billed by the contractor at the contract price, regardless of which public agency is being billed.
- d. The following shall be deemed to be the date of payment: the date of postmark in all cases where payment is made by mail, or the date of offset when offset proceedings have been instituted as authorized under the Virginia Debt Collection Act.
- e. Unreasonable Charges. Under certain emergency procurements and for most time and material purchases, final job costs cannot be accurately determined at the time orders are placed. In such cases, contractors should be put on notice that final payment in full is contingent on a determination of reasonableness with respect to all invoiced charges. Charges which appear to be unreasonable will be researched and challenged, and that portion of the invoice held in abeyance until a settlement can be reached. Upon determining that invoiced charges are not reasonable, the Commonwealth shall promptly notify the contractor, in writing, as to those charges which it considers unreasonable and the basis for the determination. A contractor may not institute legal action unless a settlement cannot be reached within thirty (30) days of notification. The provisions of this section do not relieve an agency of its prompt payment obligations with respect to those charges which are not in dispute (*Rules Governing Procurement, Chapter 2, Exhibit J, Attachment 1 § 53; available for review at <http://www.jmu.edu/procurement>*).

2. To Subcontractors:

- a. A contractor awarded a contract under this solicitation is hereby obligated:

- (1) To pay the subcontractor(s) within seven (7) days of the contractor's receipt of payment from the Commonwealth for the proportionate share of the payment received for work performed by the subcontractor(s) under the contract; or

- (2) To notify the agency and the subcontractors, in writing, of the contractor's intention to withhold payment and the reason.
- b. The contractor is obligated to pay the subcontractor(s) interest at the rate of one percent per month (unless otherwise provided under the terms of the contract) on all amounts owed by the contractor that remain unpaid seven (7) days following receipt of payment from the Commonwealth, except for amounts withheld as stated in (2) above. The date of mailing of any payment by U. S. Mail is deemed to be payment to the addressee. These provisions apply to each sub-tier contractor performing under the primary contract. A contractor's obligation to pay an interest charge to a subcontractor may not be construed to be an obligation of the Commonwealth.
3. Each prime contractor who wins an award in which provision of a SWAM procurement plan is a condition to the award, shall deliver to the contracting agency or institution, on or before request for final payment, evidence and certification of compliance (subject only to insubstantial shortfalls and to shortfalls arising from subcontractor default) with the SWAM procurement plan. Final payment under the contract in question may be withheld until such certification is delivered and, if necessary, confirmed by the agency or institution, or other appropriate penalties may be assessed in lieu of withholding such payment.
4. The Commonwealth of Virginia encourages contractors and subcontractors to accept electronic and credit card payments.
- K. PRECEDENCE OF TERMS: Paragraphs A through J of these General Terms and Conditions and the Commonwealth of Virginia Purchasing Manual for Institutions of Higher Education and their Vendors, shall apply in all instances. In the event there is a conflict between any of the other General Terms and Conditions and any Special Terms and Conditions in this solicitation, the Special Terms and Conditions shall apply.
- L. QUALIFICATIONS OF OFFERORS: The Commonwealth may make such reasonable investigations as deemed proper and necessary to determine the ability of the offeror to perform the services/furnish the goods and the offeror shall furnish to the Commonwealth all such information and data for this purpose as may be requested. The Commonwealth reserves the right to inspect offeror's physical facilities prior to award to satisfy questions regarding the offeror's capabilities. The Commonwealth further reserves the right to reject any proposal if the evidence submitted by, or investigations of, such offeror fails to satisfy the Commonwealth that such offeror is properly qualified to carry out the obligations of the contract and to provide the services and/or furnish the goods contemplated therein.
- M. TESTING AND INSPECTION: The Commonwealth reserves the right to conduct any test/inspection it may deem advisable to assure goods and services conform to the specifications.
- N. ASSIGNMENT OF CONTRACT: A contract shall not be assignable by the contractor in whole or in part without the written consent of the Commonwealth.
- O. CHANGES TO THE CONTRACT: Changes can be made to the contract in any of the following ways:
1. The parties may agree in writing to modify the scope of the contract. An increase or decrease in the price of the contract resulting from such modification shall be agreed to by the parties as a part of their written agreement to modify the scope of the contract.

2. The Purchasing Agency may order changes within the general scope of the contract at any time by written notice to the contractor. Changes within the scope of the contract include, but are not limited to, things such as services to be performed, the method of packing or shipment, and the place of delivery or installation. The contractor shall comply with the notice upon receipt. The contractor shall be compensated for any additional costs incurred as the result of such order and shall give the Purchasing Agency a credit for any savings. Said compensation shall be determined by one of the following methods:
 - a. By mutual agreement between the parties in writing; or
 - b. By agreeing upon a unit price or using a unit price set forth in the contract, if the work to be done can be expressed in units, and the contractor accounts for the number of units of work performed, subject to the Purchasing Agency's right to audit the contractor's records and/or to determine the correct number of units independently; or
 - c. By ordering the contractor to proceed with the work and keep a record of all costs incurred and savings realized. A markup for overhead and profit may be allowed if provided by the contract. The same markup shall be used for determining a decrease in price as the result of savings realized. The contractor shall present the Purchasing Agency with all vouchers and records of expenses incurred and savings realized. The Purchasing Agency shall have the right to audit the records of the contractor as it deems necessary to determine costs or savings. Any claim for an adjustment in price under this provision must be asserted by written notice to the Purchasing Agency within thirty (30) days from the date of receipt of the written order from the Purchasing Agency. If the parties fail to agree on an amount of adjustment, the question of an increase or decrease in the contract price or time for performance shall be resolved in accordance with the procedures for resolving disputes provided by the Disputes Clause of this contract or, if there is none, in accordance with the disputes provisions of the Commonwealth of Virginia Purchasing Manual for Institutions of Higher Education and their Vendors. Neither the existence of a claim nor a dispute resolution process, litigation or any other provision of this contract shall excuse the contractor from promptly complying with the changes ordered by the Purchasing Agency or with the performance of the contract generally.

- P. DEFAULT: In case of failure to deliver goods or services in accordance with the contract terms and conditions, the Commonwealth, after due oral or written notice, may procure them from other sources and hold the contractor responsible for any resulting additional purchase and administrative costs. This remedy shall be in addition to any other remedies which the Commonwealth may have.

- Q. INSURANCE: By signing and submitting a proposal under this solicitation, the offeror certifies that if awarded the contract, it will have the following insurance coverage at the time the contract is awarded. For construction contracts, if any subcontractors are involved, the subcontractor will have workers' compensation insurance in accordance with § 25 of the Rules Governing Procurement – Chapter 2, Exhibit J, Attachment 1, and 65.2-800 et. Seq. of the Code of Virginia (available for review at <http://www.jmu.edu/procurement>) The offeror further certifies that the contractor and any subcontractors will maintain these insurance coverage during the entire term of the contract and that all insurance coverage will be provided by insurance companies authorized to sell insurance in Virginia by the Virginia State Corporation Commission.

MINIMUM INSURANCE COVERAGES AND LIMITS REQUIRED FOR MOST CONTRACTS:

1. Workers' Compensation: Statutory requirements and benefits. Coverage is compulsory for employers of three or more employees, to include the employer. Contractors who fail to notify the Commonwealth of increases in the number of employees that change their workers' compensation requirement under the Code of Virginia during the course of the contract shall be in noncompliance with the contract.
 2. Employer's Liability: \$100,000
 3. Commercial General Liability: \$1,000,000 per occurrence and \$2,000,000 in the aggregate. Commercial General Liability is to include bodily injury and property damage, personal injury and advertising injury, products and completed operations coverage. The Commonwealth of Virginia must be named as an additional insured and so endorsed on the policy.
 4. Automobile Liability: \$1,000,000 combined single limit. *(Required only if a motor vehicle not owned by the Commonwealth is to be used in the contract. Contractor must assure that the required coverage is maintained by the Contractor (or third party owner of such motor vehicle.)*
- R. ANNOUNCEMENT OF AWARD: Upon the award or the announcement of the decision to award a contract over \$100,000, as a result of this solicitation, the purchasing agency will publicly post such notice on the DGS/DPS eVA web site (www.eva.virginia.gov) for a minimum of 10 days.
- S. DRUG-FREE WORKPLACE: During the performance of this contract, the contractor agrees to (i) provide a drug-free workplace for the contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the contractor that the contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

For the purposes of this section, "drug-free workplace" means a site for the performance of work done in connection with a specific contract awarded to a contractor, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

- T. NONDISCRIMINATION OF CONTRACTORS: An offeror, or contractor shall not be discriminated against in the solicitation or award of this contract because of race, religion, color, sex, sexual orientation, gender identity, national origin, age, disability, faith-based organizational status, any other basis prohibited by state law relating to discrimination in employment or because the offeror employs ex-offenders unless the state agency, department or institution has made a written determination that employing ex-offenders on the specific contract is not in its best interest. If the award of this contract is made to a faith-based organization and an individual, who applies for or receives goods, services, or disbursements provided pursuant to this contract objects to the religious character of the faith-based organization from which the individual receives or would receive the goods, services, or disbursements, the public body shall offer the individual, within a reasonable period of time

after the date of his objection, access to equivalent goods, services, or disbursements from an alternative provider.

- U. eVA BUSINESS TO GOVERNMENT VENDOR REGISTRATION, CONTRACTS, AND ORDERS: The eVA Internet electronic procurement solution, website portal www.eVA.virginia.gov, streamlines and automates government purchasing activities in the Commonwealth. The eVA portal is the gateway for vendors to conduct business with state agencies and public bodies. All vendors desiring to provide goods and/or services to the Commonwealth shall participate in the eVA Internet eprocurement solution by completing the free eVA Vendor Registration. All offerors must register in eVA and pay the Vendor Transaction Fees specified below; failure to register will result in the proposal being rejected. Vendor transaction fees are determined by the date the original purchase order is issued and the current fees are as follows:

Vendor transaction fees are determined by the date the original purchase order is issued and the current fees are as follows:

1. For orders issued July 1, 2014 and after, the Vendor Transaction Fee is:
 - a. Department of Small Business and Supplier Diversity (SBSD) certified Small Businesses: 1% capped at \$500 per order.
 - b. Businesses that are not Department of Small Business and Supplier Diversity (SBSD) certified Small Businesses: 1% capped at \$1,500 per order.
2. For orders issued prior to July 1, 2014 the vendor transaction fees can be found at www.eVA.virginia.gov.
3. The specified vendor transaction fee will be invoiced by the Commonwealth of Virginia Department of General Services approximately 60 days after the corresponding purchase order is issued and payable 30 days after the invoice date. Any adjustments (increases/decreases) will be handled through purchase order changes.

- V. AVAILABILITY OF FUNDS: It is understood and agreed between the parties herein that the Commonwealth of Virginia shall be bound hereunder only to the extent of the funds available or which may hereafter become available for the purpose of this agreement.

- W. PRICING CURRENCY: Unless stated otherwise in the solicitation, offerors shall state offered prices in U.S. dollars.

- X. E-VERIFY REQUIREMENT OF ANY CONTRACTOR: Any employer with more than an average of 50 employees for the previous 12 months entering into a contract in excess of \$50,000 with James Madison University to perform work or provide services pursuant to such contract shall register and participate in the E-Verify program to verify information and work authorization of its newly hired employees performing work pursuant to any awarded contract.

- Y. CIVILITY IN STATE WORKPLACES: The contractor shall take all reasonable steps to ensure that no individual, while performing work on behalf of the contractor or any subcontractor in connection with this agreement (each, a "Contract Worker"), shall engage in 1) harassment (including sexual harassment), bullying, cyber-bullying, or threatening or violent conduct, or 2) discriminatory behavior on the basis of race, sex, color, national origin, religious belief, sexual orientation, gender identity or expression, age, political affiliation, veteran status, or disability.

The contractor shall provide each Contract Worker with a copy of this Section and will require Contract Workers to participate in training on civility in the State workplace. Upon request, the contractor shall provide documentation that each Contract Worker has received such training.

For purposes of this Section, "State workplace" includes any location, permanent or temporary, where a Commonwealth employee performs any work-related duty or is representing his or her agency, as well as surrounding perimeters, parking lots, outside meeting locations, and means of travel to and from these locations. Communications are deemed to occur in a State workplace if the Contract Worker reasonably should know that the phone number, email, or other method of communication is associated with a State workplace or is associated with a person who is a State employee.

The Commonwealth of Virginia may require, at its sole discretion, the removal and replacement of any Contract Worker who the Commonwealth reasonably believes to have violated this Section.

This Section creates obligations solely on the part of the contractor. Employees or other third parties may benefit incidentally from this Section and from training materials or other communications distributed on this topic, but the Parties to this agreement intend this Section to be enforceable solely by the Commonwealth and not by employees or other third parties.

VIII. SPECIAL TERMS AND CONDITIONS

- A. AUDIT: The Contractor hereby agrees to retain all books, records, systems, and other documents relative to this contract for five (5) years after final payment, or until audited by the Commonwealth of Virginia, whichever is sooner. The Commonwealth of Virginia, its authorized agents, and/or State auditors shall have full access to and the right to examine any of said materials during said period.
- B. CANCELLATION OF CONTRACT: James Madison University reserves the right to cancel and terminate any resulting contract, in part or in whole, without penalty, upon 60 days written notice to the contractor. In the event the initial contract period is for more than 12 months, the resulting contract may be terminated by either party, without penalty, after the initial 12 months of the contract period upon 60 days written notice to the other party. Any contract cancellation notice shall not relieve the contractor of the obligation to deliver and/or perform on all outstanding orders issued prior to the effective date of cancellation.
- C. IDENTIFICATION OF PROPOSAL ENVELOPE: The signed proposal should be returned in a separate envelope or package, sealed and identified as follows:

From: _____

_____	_____	_____
Name of Offeror	Due Date	Time
_____		_____
Street or Box No.		RFP #
_____		_____
City, State, Zip Code		RFP Title
Name of Purchasing Officer: _____		

The envelope should be addressed as directed on the title page of the solicitation.

The Offeror takes the risk that if the envelope is not marked as described above, it may be inadvertently opened and the information compromised, which may cause the proposal to be disqualified. Proposals may be hand-delivered to the designated location in the office issuing the solicitation. No other correspondence or other proposals should be placed in the envelope.

- D. LATE PROPOSALS: To be considered for selection, proposals must be received by the issuing office by the designated date and hour. The official time used in the receipt of proposals is that time on the automatic time stamp machine in the issuing office. Proposals received in the issuing office after the date and hour designated are automatically non responsive and will not be considered. The University is not responsible for delays in the delivery of mail by the U.S. Postal Service, private couriers, or the intra university mail system. It is the sole responsibility of the Offeror to ensure that its proposal reaches the issuing office by the designated date and hour.
- E. UNDERSTANDING OF REQUIREMENTS: It is the responsibility of each offeror to inquire about and clarify any requirements of this solicitation that is not understood. The University will not be bound by oral explanations as to the meaning of specifications or language contained in this solicitation. Therefore, all inquiries deemed to be substantive in nature must be in writing and submitted to the responsible buyer in the Procurement Services Office. Offerors must ensure that written inquiries reach the buyer at least five (5) days prior to the time set for receipt of offerors proposals. A copy of all queries and the respective response will be provided in the form of an addendum to all offerors who have indicated an interest in responding to this solicitation. Your signature on your Offer certifies that you fully understand all facets of this solicitation. These questions may be sent by Fax to 540/568-7935.
- F. RENEWAL OF CONTRACT: This contract may be renewed by the Commonwealth for a period of nine (9) successive one year periods under the terms and conditions of the original contract except as stated in 1. and 2. below. Price increases may be negotiated only at the time of renewal. Written notice of the Commonwealth's intention to renew shall be given approximately 90 days prior to the expiration date of each contract period.
1. If the Commonwealth elects to exercise the option to renew the contract for an additional one-year period, the contract price(s) for the additional one year shall not exceed the contract price(s) of the original contract increased/decreased by no more than the percentage increase/decrease of the other services category of the CPI-W section of the Consumer Price Index of the United States Bureau of Labor Statistics for the latest twelve months for which statistics are available.
 2. If during any subsequent renewal periods, the Commonwealth elects to exercise the option to renew the contract, the contract price(s) for the subsequent renewal period shall not exceed the contract price(s) of the previous renewal period increased/decreased by more than the percentage increase/decrease of the other services category of the CPI-W section of the Consumer Price Index of the United States Bureau of Labor Statistics for the latest twelve months for which statistics are available.
- G. SUBMISSION OF INVOICES: All invoices shall be submitted within sixty days of contract term expiration for the initial contract period as well as for each subsequent contract renewal period. Any invoices submitted after the sixty day period will not be processed for payment.
- H. OPERATING VEHICLES ON JAMES MADISON UNIVERSITY CAMPUS: Operating vehicles on sidewalks, plazas, and areas heavily used by pedestrians is prohibited. In the unlikely event a driver should find it necessary to drive on James Madison University sidewalks, plazas, and areas heavily used by pedestrians, the driver must yield to pedestrians.

For a complete list of parking regulations, please go to www.jmu.edu/parking; or to acquire a service representative parking permit, contact Parking Services at 540.568.3300. The safety of our students, faculty and staff is of paramount importance to us. Accordingly, violators may be charged.

- I. COOPERATIVE PURCHASING / USE OF AGREEMENT BY THIRD PARTIES: It is the intent of this solicitation and resulting contract(s) to allow for cooperative procurement. Accordingly, any public body, (to include government/state agencies, political subdivisions, etc.), cooperative purchasing organizations, public or private health or educational institutions or any University related foundation and affiliated corporations may access any resulting contract if authorized by the Contractor.

Participation in this cooperative procurement is strictly voluntary. If authorized by the Contractor(s), the resultant contract(s) will be extended to the entities indicated above to purchase goods and services in accordance with contract terms. As a separate contractual relationship, the participating entity will place its own orders directly with the Contractor(s) and shall fully and independently administer its use of the contract(s) to include contractual disputes, invoicing and payments without direct administration from the University. No modification of this contract or execution of a separate agreement is required to participate; however, the participating entity and the Contractor may modify the terms and conditions of this contract to accommodate specific governing laws, regulations, policies, and business goals required by the participating entity. Any such modification will apply solely between the participating entity and the Contractor.

The Contractor will notify the University in writing of any such entities accessing this contract. The Contractor will provide semi-annual usage reports for all entities accessing the contract. The University shall not be held liable for any costs or damages incurred by any other participating entity as a result of any authorization by the Contractor to extend the contract. It is understood and agreed that the University is not responsible for the acts or omissions of any entity and will not be considered in default of the contract no matter the circumstances.

Use of this contract(s) does not preclude any participating entity from using other contracts or competitive processes as needed.

- J. SMALL BUSINESS SUBCONTRACTING AND EVIDENCE OF COMPLIANCE:

1. It is the goal of the Commonwealth that 42% of its purchases are made from small businesses. This includes discretionary spending in prime contracts and subcontracts. All potential offerors are required to submit a Small Business Subcontracting Plan. Unless the offeror is registered as a Department of Small Business and Supplier Diversity (SBSD)-certified small business and where it is practicable for any portion of the awarded contract to be subcontracted to other suppliers, the contractor is encouraged to offer such subcontracting opportunities to SBSBD-certified small businesses. This shall not exclude SBSBD-certified women-owned and minority-owned businesses when they have received SBSBD small business certification. No offeror or subcontractor shall be considered a Small Business, a Women-Owned Business or a Minority-Owned Business unless certified as such by the Department of Small Business and Supplier Diversity (SBSD) by the due date for receipt of proposals. If small business subcontractors are used, the prime contractor agrees to report the use of small business subcontractors by providing the purchasing office at a minimum the following information: name of small business with the SBSBD certification number or FEIN, phone number, total dollar amount subcontracted, category type (small, women-owned, or minority-owned), and type of product/service provided.

This information shall be submitted to: JMU Office of Procurement Services, Attn: SWAM Subcontracting Compliance, MSC 5720, Harrisonburg, VA 22807.

2. Each prime contractor who wins an award in which provision of a small business subcontracting plan is a condition of the award, shall deliver to the contracting agency or institution with every request for payment, evidence of compliance (subject only to insubstantial shortfalls and to shortfalls arising from subcontractor default) with the small business subcontracting plan. **This information shall be submitted to: JMU Office of Procurement Services, SWAM Subcontracting Compliance, MSC 5720, Harrisonburg, VA 22807.** When such business has been subcontracted to these firms and upon completion of the contract, the contractor agrees to furnish the purchasing office at a minimum the following information: name of firm with the Department of Small Business and Supplier Diversity (SBSD) certification number or FEIN number, phone number, total dollar amount subcontracted, category type (small, women-owned, or minority-owned), and type of product or service provided. Payment(s) may be withheld until compliance with the plan is received and confirmed by the agency or institution. The agency or institution reserves the right to pursue other appropriate remedies to include, but not be limited to, termination for default.
 3. Each prime contractor who wins an award valued over \$200,000 shall deliver to the contracting agency or institution with every request for payment, information on use of subcontractors that are not Department of Small Business and Supplier Diversity (SBSD)-certified small businesses. When such business has been subcontracted to these firms and upon completion of the contract, the contractor agrees to furnish the purchasing office at a minimum the following information: name of firm, phone number, FEIN number, total dollar amount subcontracted, and type of product or service provided. **This information shall be submitted to: JMU Office of Procurement Services, Attn: SWAM Subcontracting Compliance, MSC 5720, Harrisonburg, VA 22807.**
- K. AUTHORIZATION TO CONDUCT BUSINESS IN THE COMMONWEALTH: A contractor organized as a stock or nonstock corporation, limited liability company, business trust, or limited partnership or registered as a registered limited liability partnership shall be authorized to transact business in the Commonwealth as a domestic or foreign business entity if so required by Title 13.1 or Title 50 of the Code of Virginia or as otherwise required by law. Any business entity described above that enters into a contract with a public body shall not allow its existence to lapse or its certificate of authority or registration to transact business in the Commonwealth, if so required under Title 13.1 or Title 50, to be revoked or cancelled at any time during the term of the contract. A public body may void any contract with a business entity if the business entity fails to remain in compliance with the provisions of this section.
- L. PUBLIC POSTING OF COOPERATIVE CONTRACTS: James Madison University maintains a web-based contracts database with a public gateway access. Any resulting cooperative contract/s to this solicitation will be posted to the publicly accessible website. Contents identified as proprietary information will not be made public.
- M. CRIMINAL BACKGROUND CHECKS OF PERSONNEL ASSIGNED BY CONTRACTOR TO PERFORM WORK ON JMU PROPERTY: The Contractor shall obtain criminal background checks on all of their contracted employees who will be assigned to perform services on James Madison University property. The results of the background checks will be directed solely to the Contractor. The Contractor bears responsibility for confirming to the University contract administrator that the background checks have been completed prior to work being performed by their employees or subcontractors. The Contractor shall only assign to work on the University campus those individuals whom it deems qualified and permissible

based on the results of completed background checks. Notwithstanding any other provision herein, and to ensure the safety of students, faculty, staff and facilities, James Madison University reserves the right to approve or disapprove any contract employee that will work on JMU property. Disapproval by the University will solely apply to JMU property and should have no bearing on the Contractor's employment of an individual outside of James Madison University.

- N. INDEMNIFICATION: Contractor agrees to indemnify, defend and hold harmless the Commonwealth of Virginia, its officers, agents, and employees from any claims, damages and actions of any kind or nature, whether at law or in equity, arising from or caused by the use of any materials, goods, or equipment of any kind or nature furnished by the contractor/any services of any kind or nature furnished by the contractor, provided that such liability is not attributable to the sole negligence of the using agency or to failure of the using agency to use the materials, goods, or equipment in the manner already and permanently described by the contractor on the materials, goods or equipment delivered.
- O. ADDITIONAL GOODS AND SERVICES: The University may acquire other goods or services that the supplier provides than those specifically solicited. The University reserves the right, subject to mutual agreement, for the Contractor to provide additional goods and/or services under the same pricing, terms, and conditions and to make modifications or enhancements to the existing goods and services. Such additional goods and services may include other products, components, accessories, subsystems, or related services that are newly introduced during the term of this Agreement. Such additional goods and services will be provided to the University at favored nations pricing, terms, and conditions.
- P. ADVERTISING: In the event a contract is awarded for supplies, equipment, or services resulting from this proposal, no indication of such sales or services to James Madison University will be used in product literature or advertising without the express written consent of the University. The contractor shall not state in any of its advertising or product literature that James Madison University has purchased or uses any of its products or services, and the contractor shall not include James Madison University in any client list in advertising and promotional materials without the express written consent of the University.
- Q. ELECTRICAL EQUIPMENT STANDARDS: All equipment/material shall conform to the latest issue of all applicable standards as established by National Electrical Manufacturer's Association (NEMA), American National Standards Institute (ANSI), and Occupational Safety & Health Administration (OSHA). All equipment and material, for which there are OSHA standards, shall bear an appropriate label of approval for use intended from a Nationally Recognized Testing Laboratory (NRTL).
- R. WARRANTY (COMMERCIAL): The contractor agrees that the goods or services furnished under any award resulting from this solicitation shall be covered by the most favorable commercial warranties the contractor gives any customer for such goods or services and that the rights and remedies provided therein are in addition to and do not limit those available to the Commonwealth by any other clause of this solicitation. A copy of this warranty should be furnished with the bid/proposal.
- S. WORK SITE DAMAGES: Any damage to existing utilities, equipment or finished surfaces resulting from the performance of this contract shall be repaired to the Commonwealth's satisfaction at the contractor's expense.
- T. STANDARDS OF CONDUCT: The work site will be occupied by students and University Personnel during the times work is performed. Contractor and Contractor's personnel shall

exercise a particularly high level of discipline, safety and cooperation at all times while on the job site. The Contractor shall be responsible for controlling employee conduct, for assuring that its employees are not boisterous or rude, and assuring that they are not engaging in any destructive or criminal activity. The Contractor is also responsible for ensuring that its employees do not disturb papers on desks, or open desk drawers, cabinets, or briefcases, or use State phones, and the like, except as authorized.

IX. METHOD OF PAYMENT

The contractor will be paid based on invoices submitted in accordance with the solicitation and any negotiations. James Madison University recognizes the importance of expediting the payment process for our vendors and suppliers; we request that our vendors and suppliers enroll in our bank's Comprehensive Payable options: either the Virtual Payables Virtual Card or the PayMode-X electronic deposit (ACH) to your bank account so that future payments are made electronically. Contractors signed up for the Virtual Payables process will receive the benefit of being paid Net 15. Additional information is available online at:

<http://www.jmu.edu/financeoffice/accounting-operations-disbursements/cash-investments/vendor-payment-methods.shtml>

X. PRICING SCHEDULE

The offeror shall provide pricing for all products and services included in proposal indicating one-time and on-going costs. The resulting contract will be cooperative and pricing shall be inclusive for the attached Zone Map, of which JMU falls within Zone 2.

Specify any associated charge card processing fees, if applicable, to be billed to the university.

Add additional rows as needed to list all rates for labor and services as well as goods and equipment offered.

Annual Pricing for Testing, Routine Service, Test Kits and Chemicals	
Ninety Eight (98) closed loops with water	\$
Twenty Two (22) closed loops with propylene glycol	\$
Twenty Four (24) cooling towers with a total capacity of 8,108 tons and 31 cooling tower cells	\$
Monthly review and recommendations of Twenty Four (24) cooling towers and all 31 cooling tower cells	\$
Perform facility legionella plan testing on 24 cooling towers with quarterly provision of 24 – 5 gallon containers of >12% active sodium hypochlorite and 24 legionella culture CDC Elite certified tests per year	\$
Price to perform one set of HPC and CDC Elite Certified Legionella	\$

PRICING SCHEDULE BY ZONE									
Regular Time Labor Rates (7:30 AM – 4:00 PM Monday – Friday)*									
Service	<i>Zone 1</i>	<i>Zone 2</i>	<i>Zone 3</i>	<i>Zone 4</i>	<i>Zone 5</i>	<i>Zone 6</i>	<i>Zone 7</i>	<i>Zone 8</i>	<i>Zone 9</i>
Service Technician/Tradesman Labor Rate \$/hour									
Engineer/Scientist Labor Rate \$/hour									
Overtime/Emergency Labor Rates (Outside of Regular Time working hours)									
Service Technician/Tradesman Labor Rate \$/hour									
Engineer/Scientist Labor Rate \$/hour									

Labor rates shall include all direct and indirect costs such as transportation, supervision, general and administrative costs and profit, etc. Equipment and other parts/products will be billed as indicated below. Monthly and quarterly service is not included in this section.

Products & Equipment									
	% Off List Discount Offered by Zone								
Replacement parts and/or components									
New water systems and HVAC related equipment									

Other Fees	
<i>Charge Card Processing Fees</i>	%

XI. ATTACHMENTS

Attachment A: Offeror Data Sheet

Attachment B: Small, Women, and Minority-owned Business (SWaM) Utilization Plan

Attachment C: Standard Contract Sample

Attachment D: Zone Map

ATTACHMENT A

OFFEROR DATA SHEET

TO BE COMPLETED BY OFFEROR

1. QUALIFICATIONS OF OFFEROR: Offerors must have the capability and capacity in all respects to fully satisfy the contractual requirements.
2. YEARS IN BUSINESS: Indicate the length of time you have been in business providing these types of goods and services.
Years _____ Months _____

3. REFERENCES: Indicate below a listing of at least five (5) organizations, either commercial or governmental/educational, that your agency is servicing. Include the name and address of the person the purchasing agency has your permission to contact.

CLIENT	LENGTH OF SERVICE	ADDRESS	CONTACT PERSON/PHONE #
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4. List full names and addresses of Offeror and any branch offices which may be responsible for administering the contract.

5. RELATIONSHIP WITH THE COMMONWEALTH OF VIRGINIA: Is any member of the firm an employee of the Commonwealth of Virginia who has a personal interest in this contract pursuant to the [CODE OF VIRGINIA](#), SECTION 2.2-3100 – 3131?

YES NO

IF YES, EXPLAIN: _____

ATTACHMENT B

Small, Women and Minority-owned Businesses (SWaM) Utilization Plan

Offeror Name: _____ Preparer Name: _____

Date: _____

Is your firm a **Small Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes _____ No _____

If yes, certification number: _____ Certification date: _____

Is your firm a **Woman-owned Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes _____ No _____

If yes, certification number: _____ Certification date: _____

Is your firm a **Minority-Owned Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes _____ No _____

If yes, certification number: _____ Certification date: _____

Is your firm a **Micro Business** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes _____ No _____

If yes, certification number: _____ Certification date: _____

Instructions: *Populate the table below to show your firm's plans for utilization of small, women-owned and minority-owned business enterprises in the performance of the contract. Describe plans to utilize SWAMs businesses as part of joint ventures, partnerships, subcontractors, suppliers, etc.*

Small Business: "Small business " means a business, independently owned or operated by one or more persons who are citizens of the United States or non-citizens who are in full compliance with United States immigration law, which, together with affiliates, has 250 or fewer employees, or average annual gross receipts of \$10 million or less averaged over the previous three years.

Woman-Owned Business Enterprise: A business concern which is at least 51 percent owned by one or more women who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in which is owned by one or more women, and whose management and daily business operations are controlled by one or more of such individuals. **For purposes of the SWAM Program, all certified women-owned businesses are also a small business enterprise.**

Minority-Owned Business Enterprise: A business concern which is at least 51 percent owned by one or more minorities or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in which is owned by one or more minorities and whose management and daily business operations are controlled by one or more of such individuals. **For purposes of the SWAM Program, all certified minority-owned businesses are also a small business enterprise.**

Micro Business is a certified Small Business under the SWaM Program and has no more than twenty-five (25) employees AND no more than \$3 million in average annual revenue over the three-year period prior to their certification.

All small, women, and minority owned businesses must be certified by the Commonwealth of Virginia Department of Small Business and Supplier Diversity (SBSD) to be counted in the SWAM program. Certification applications are available through SBSD at 800-223-0671 in Virginia, 804-786-6585 outside Virginia, or online at <http://www.sbsd.virginia.gov/> (Customer Service).

RETURN OF THIS PAGE IS REQUIRED

ATTACHMENT B (CNT'D)
 Small, Women and Minority-owned Businesses (SWaM) Utilization Plan

Procurement Name and Number: _____

Date Form Completed: _____

Listing of Sub-Contractors, to include, Small, Woman Owned and Minority Owned Businesses
 for this Proposal and Subsequent Contract

Offeror / Proposer:

_____ Firm

_____ Address

_____ Contact Person/No.

Sub-Contractor's Name and Address	Contact Person & Phone Number	SBSD Certification Number	Services or Materials Provided	Total Subcontractor Contract Amount (to include change orders)	Total Dollars Paid Subcontractor to date (to be submitted with request for payment from JMU)

(Form shall be submitted with proposal and if awarded, again with submission of each request for payment)

RETURN OF THIS PAGE IS REQUIRED

ATTACHMENT C



COMMONWEALTH OF VIRGINIA
STANDARD CONTRACT

Contract No. _____

This contract entered into this _____ day of _____ 20____, by _____ hereinafter called the "Contractor" and Commonwealth of Virginia, James Madison University called the "Purchasing Agency".

WITNESSETH that the Contractor and the Purchasing Agency, in consideration of the mutual covenants, promises and agreements herein contained, agree as follows:

SCOPE OF CONTRACT: The Contractor shall provide the services to the Purchasing Agency as set forth in the Contract Documents.

PERIOD OF PERFORMANCE: From _____ through _____

The contract documents shall consist of:

- (1) This signed form;
- (2) The following portions of the Request for Proposals dated _____:
 - (a) The Statement of Needs,
 - (b) The General Terms and Conditions,
 - (c) The Special Terms and Conditions together with any negotiated modifications of those Special Conditions;
 - (d) List each addendum that may be issued
- (3) The Contractor's Proposal dated _____ and the following negotiated modification to the Proposal, all of which documents are incorporated herein.
 - (a) Negotiations summary dated _____.

IN WITNESS WHEREOF, the parties have caused this Contract to be duly executed intending to be bound thereby.

CONTRACTOR:

PURCHASING AGENCY:

By: _____
(Signature)

By: _____
(Signature)

(Printed Name)

(Printed Name)

Title: _____

Title: _____

ADDENDUM NO.: ONE (1)
TO ALL OFFERORS:

REFERENCE: Request for Proposal No: **RFP# MPM-1195**
Dated: **September 25, 2023**
RFP Closing On: **October 25, 2023 at 2:00 p.m. (Eastern)**

Please note the clarifications and/or changes made on this proposal program:

1. Do you use Sodium Nitrate or Molybdenum in the non-Glycol closed loops?
 - a. Sodium Nitrate.
2. Please provide Pricing Schedule information about the boilers to be serviced.
 - a. Five (5) High Pressure Steam Boilers. Total steam generation capacity 270,000 lbs. per hour.
3. Are the cooling tower controllers linked into a network system?
 - a. No.
4. Are all the systems on city water or are some on well water?
 - a. City water.
5. Does JMU own all equipment (chemical feed systems and containment tanks)?
 - a. Yes.
6. Who is doing the cooling tower cleaning? Annually?
 - a. Performed in-house by Trades Technicians.
7. What are the operating conditions of the cooling towers?
 - a. Incoming Water Quality: total hardness = 60 ppm, total alkalinity = 60/pH = 7.2, Conductivity = 125, Cycles = 4, Tonnage: 7520 & 8800 tons, MU Flow: varies 0-200 GPM, Blowdown flow and discharge = No data available; blowdown rate is set to maintain 650 conductivity, Manufacturer Serial Number = No available, Operating time = 24/7/365
8. Is there any Legionella testing done on the cooling towers?
 - a. Yes, annually.
9. What are the operating conditions for the Boilers-
 - a. Incoming Water Quality = Total Hardness = 60 PPM, Total Alkalinity = 60, pH = 7.2, Conductivity = 125, Cycles = N/A, HP = Total – 7,917 HP, Steam production (lbs/hr) = 270,000 Blowdown rate = 3% , Pretreatment and blowdown discharge = Water Softeners.
10. Closed loop sizes?
 - a. No data available.

11. Estimated water loss from leaks?
 - a. Less than 5%.
12. What is the percentage of glycol required?
 - a. 30 – 35%
13. What are your water, sewer, and boiler fuel rates (for ROI calculations)
 - a. Water and sewer together @ \$8.75 per k/gal.
 - b. Boiler fuel: NG - \$8.90 DTH; Diesel = \$5.50 per gallon.
14. Can you provide annual water data for the cooling and boiler systems or provide an average % load to base my calculations on?
 - a. ECPP consumes approximately 25 to 30 million gallons annually on cooling tower make-up, boiler water make-up consumes approximately 4 to 5 million gallons per year, this is an average of approximately 8 to 10% make-up rate.
15. What is the construction material for the cooling towers/condensers?
 - a. Varies campus wide (includes but is not limited to: stainless steel, galvanized steel, and PVC fill).
16. How many pounds of nitrate do you purchase annually?
 - a. Unknown, purchased as required.
17. How many pounds of molybdenum do you purchase annually?
 - a. Unknown, purchased as required.
18. Could you provide a current equipment list for the chemical control?
 - a. JMU owns all equipment for chemical control. List is too extensive to include here.
19. Are there any access restrictions to any Cooling Tower and/or Boiler systems?
 - a. Access is limited (per the RFP). All site visits require a JMU rep to be present.
20. Would a hands-free/drum-free deliver program be able to be utilized?
 - a. This would not be feasible in most locations.
21. Would JMU be interested in pursuing an alternative to heavy metal treatment?
 - a. If the treatment is aluminum-safe.
22. Can you please provide me with your discharge permits restrictions?
 - a. N/A.



23. Do you want to see price per pound for our products or just the total cost the way that you have it broken down in the RFP?

- a. As much additional information as you can provide is always helpful. You are not required to submit this information but it would be valuable.

Signify receipt of this addendum by initialing "*Addendum # 1*" on the signature page of your proposal.

Sincerely,

Michael Morrison

Michael Morrison
Buyer Senior
Phone: (540-568-6181)



October 19, 2023

**ADDENDUM NO.: TWO (2)
TO ALL OFFERORS:**

REFERENCE: Request for Proposal No: **RFP# MPM-1195**
Dated: **September 25, 2023**
RFP Closing On: **October 25, 2023 at 2:00 p.m. (Eastern)**

Please note the clarifications and/or changes made on this proposal program:

1. Can you provide the annual steam production?
 - a. Annual steam production ranges between 400 to 500 million pounds per year depending on outside temperatures.

2. Can you provide a Price Schedule addendum for the boiler services?
 - a. Please use the following table to price services for boilers.

Annual Pricing for Testing, Routine Service, Test Kits and Chemicals	
Monthly review and recommendations of five (5) HP Steam Boilers	\$
Monthly review and recommendations of six (6) condensate return systems	\$
Monthly review and recommendations for three (3) DA Feedwater Systems	\$
Monthly review and recommendations of four (4) water softeners	\$
Monthly review and recommendations of four (4) condensers	\$
Monthly review and recommendations of one (1) centralizer chiller water system	\$
Quarterly review and recommendations of ten (10) closed loop heating water systems	\$
Quarterly review and recommendations of one (1) RODI system used for humidification in CISAT A3	\$

Signify receipt of this addendum by initialing "Addendum # 2" on the signature page of your proposal.

Sincerely,

Michael Morrison

Michael Morrison
Buyer Senior
Phone: (540-568-6181)