NC STATE
UNIVERSITY

Raleigh, North Carolina
Request for Proposals (RFP)

#63-KGS1092553 - Water Treatment Services Program

For internal administrative processing, including tabulation of proposals for posting to Bonfire and the State of North Carolina Electronic Vendor Portal (eVP), please provide your company's Federal Employer Identification Number or alternate identification number (e.g. Social Security Number). We HIGHLY recommend you register in order to see bid tabulations and award results. Pursuant to G.S. 132-1.10(b) this identification number shall not be released to the public. This page will be removed and shredded, or otherwise kept confidential, before the procurement file is available for public inspection.

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NC STATE UNIVERSITY

REQUEST FOR PROPOSALS (RFP)
RFP # 63-KGS1092553

TITLE:	Water Treatment Services Program
USING DEPARTMENT:	Facilities Division
ISSUE DATE:	July 24, 2025
DUE DATE:	**2:00 p.m., Monday, August 25, 2025**
ISSUING AGENCY:	NC State University Procurement Services Department Campus Box 7212 Raleigh, NC 27695

Proposals subject to the conditions made a part hereof will be accepted until **2:00 p.m., Monday, August 25, 2025** for furnishing services described herein.

Proposals must be submitted electronically at:

https://ncsu.bonfirehub.com/opportunities/188974

Upload scanned pages from this RFP document included with your proposal response where indicated on the Bonfire website.

Direct all inquiries (via email) concerning this RFP to:

Kristen Shelton, CPPB
NC State University
Procurement Services Department
Email: kgshelto@ncsu.edu

MANDATORY PRE-PROPOSAL CONFERENCE
Date: Thursday, August 7, 2025 at 9:00 AM
Location: Yarbrough Plant

Attendance is mandatory in order for a proposal to be considered for award. Proposals from Contractors who do not attend, who arrive after 9:00 a.m., or who are not present for the entire pre-proposal conference will not be considered for award. **Please arrive early and come prepared with your questions. This will be the ONLY opportunity provided to view the venue location(s) and ask questions.** The University will attempt to provide van service for traveling around campus. For this reason, we ask that you limit attendance to two (2) members of your company. Click here to pre-register prior to **5:00 pm on August 5, 2025**. Directions from the Coliseum Parking Deck. You must walk under the East tunnel and then around SAS hall to the front of the building off Stinson Dr.

No other contact with University personnel or any other entity associated with this RFP, other than as directed above, is allowed. Attempts to gain information by any other means may be cause for rejection of the entire proposal response. Proposals from contractors arriving after 9:00 AM and who do not attend, or who are not present for the entire pre-proposal conference will not be considered for award.

1. INTRODUCTION: PURPOSE AND BACKGROUND

North Carolina State University, Facilities Division (hereafter referred to as University) seeks proposals from qualified suppliers (hereafter referred to as Supplier) to provide Water treatment Services to the Centralized Utility Plants and Distributed Systems on the Raleigh, N.C. campuses. The University has three (3) separate campus locations: the Main Campus, the Centennial Biomedical Campus, and Centennial Campus. This solicitation is for technical and cost proposals to chemically treat and technically support the steam generation and distribution systems, chilled water manufacturing and distribution systems, and condenser water system maintenance including reuse water along with heat transfer and supply water conditioning. This solicitation also encompasses a request for alternate technologies that may enhance efficient performance and decrease cost of existing and proposed systems.

2. CONTRACT PERIOD

The term of any resulting contract will be from the date of award for a period of two (2) years. The University reserves the right under the terms and conditions contained herein to renew for three (3) additional two-year periods, not to exceed a total of eight (8) years.

All prices offered herein must be held firm against any increases for the first two (2) years of any resulting contract. Renewal term increases must be indexed on the Producers Price Index, listed by the U.S. Department of Labor, Bureau of Labor Statistics, for Industrial Chemicals (Commodity Code 061) OR indexed at a 3% cap of prior yearly contract price, whichever is less.

3. SCOPE OF WORK

3.1 General Scope of Work

The following list addresses general requirements, obligations and expectations of the awarded supplier in providing chemical treatment services.

3.1.1 Overview

The water treatment program includes all boiler systems, all cooling towers, all hot water loops, and all chilled water loops. In addition, the water treatment program includes all chemical products, any required equipment, and professional consulting services to:

a. Improve program safety and reduce program risk / liability.
b. Reduce fuel and electrical consumption through improved heat transfer efficiency. This is accomplished by minimizing scale, corrosion, fouling, and microbiological growth, which create deposits on heat transfer surfaces.
c. Minimize repair and maintenance costs associated with replacement and cleaning of equipment due to scale, corrosion, fouling, or microbiological activity.
d. Provide professional, knowledgeable and involved sales/service personnel to ensure program success.
e. Accurately monitor program results and communicate appropriate recommendations with quantifiable business oriented justifications.
f. Thoroughly train maintenance personnel on the implementation and control of the program.

3.1.2 General Statements

3.1.2.1 These specifications are a statement of the minimum level of work and services that are required in certain areas under any resulting contract. They are not intended to be, nor shall they be construed as, limiting specifications or requirements. At a minimum, the supplier must take all steps and measures that would be taken by a prudent system owner to maximize the life expectancy of the systems.

3.1.2.2 The supplier must provide all management, supervision, labor, materials, supplies, repair parts, tools, and equipment to perform the services required herein, and must schedule, coordinate and ensure the effective and economical operation, maintenance and repair of equipment as specified in this RFP.

3.1.2.3 All chemical systems must be operated and maintained at a level defined as the level of maintenance required to preserve the equipment in unimpaired operational condition; i.e., above the point at which deterioration will begin, thereby diminishing the normal life expectancy and performance of the system and its components.

3.1.3 Supplier Program Management

3.1.3.1 Quality Control Program (hereafter referred to as QCP): The supplier must establish a complete QCP to assure that the requirements of this RFP are provided as specified. The QCP must at a minimum:

a. Include list of all required activities per the contract including specified periodicities (i.e. service visits, reports, inspections, tests, etc.)
b. Provide immediate visual feedback as to completed, partially completed, and not complete activities (as in the form of stop light charts)
c. Be updated by the supplier on the periodicity of service visits or more often
d. Be available to the university's personnel on a 24/7/365 basis
e. Be used during quarterly and annual meetings as a tool for assessing the service provided to the university by the supplier.

The QCP must further be a system for identifying and correcting deficiencies in the quality of services before the level of performance becomes unacceptable and/or the University personnel point out the deficiencies. An example of a previously approved QCP is provided as Appendix B.

No later than seven (7) days prior to the start of the contract, the awarded supplier must submit a copy of its program to the Contract Administrator for approval.

3.1.3.2 Supplier Representatives: The supplier must appoint two members of the company, plus one authorized alternate, to represent the supplier in dealings with the University. Only these individuals must represent the supplier regarding services for this contract unless otherwise specifically authorized by the Campus Operations and Maintenance Assistant Vice Chancellor. The names and contact information for these members of the company must be provided and updated by the supplier whenever they are changed.

The Supplier must, at no additional cost to the University, secure appropriate background checks for all employees to be assigned to any resulting contract (see attached General Terms and Conditions, Item 31). NC State may withhold consent for any of Supplier's employees to be placed on a University assignment at its sole discretion. The Supplier must immediately (same day as notification) remove any employee from NC State property that the University deems unfit for any reason.

The proposal response must include a Specific Summary Statement (see note in section 6) indicating compliance with background check policy.

3.1.3.3 Supplier Recommendations: Supplier representative must recommend treatment dosages and methods for protecting idle systems such as laying up of boilers during summer months and laying up of air conditioning systems during winter months.

3.1.3.4 Supplier Site Visits: Supplier representative must visit the campus per the schedule outlined in Section 3.2.3.1 and Section 3.3.2. The services that must be performed during these visits are outlined in Sections 3.2 and Section 3.3. The resulting contract of this RFP is for water treatment chemicals and the needed services to insure effective application, monitoring and control of the treatment program. Therefore, if services are not performed as required, the University reserves the right to withhold monthly payment until the services are satisfactorily completed. A service report must be completed, by 3:00 PM on the day of the visit, for each service visit. This report must be emailed to all appropriate University personnel by 9:00 am on the day after the visit. The representative must be available for calls on specific problems. The representative must be available to the University twenty-four (24) hours per day, and must return telephone calls within four (4) hours.

3.1.3.5 Training: Supplier representative(s) must provide training to the University staff on an as needed basis and at no additional cost to the University. This training must include how to perform tests and monitor chemical program results, how to work safely with chemical products, and general training regarding boiler and cooling systems.

The proposal response must include a Specific Summary Statement (see note in section 6) detailing the proposing firm's training capabilities. Samples of training materials must be included (syllabus and reference material).

Supplier must be capable of providing a comprehensive internet-accessible training program on a 24-7-365 basis. If utilized by the University, the program must include a Manager's tracking tool that summarizes the current status of each University employee's progress in the training process. This report must be delivered to the University management on a quarterly basis. This training service must be provided at a unit cost per module per employee enrolled.

The proposal response must include (1) a Specific Summary Statement (see note in section 6) detailing its internet-accessible training program and (2) a unit cost for this training.

3.1.3.6 Program Administration: In order to have quick access to all technical and safety information regarding the water treatment program, the supplier must provide a hardcopy and electronic Administration Notebook both available to the University on a 24 hour basis. At a minimum, this notebook must contain an outline of the chemical program, all chemical control test procedures, log sheets, product bulletins, Safety Data Sheets, feed and control equipment specifications and service reports. Both Administrative Notebooks (hard copy and electronic) must be maintained by the supplier during site visits and available to the University on a 24 hour basis.

The proposal response must include three (3) examples of completed Service Reports for steam and chilled water systems of similar size and complexity that were written by the proposed primary and secondary representatives.

The proposal response must include a Specific Summary Statement (see note in section 6) detailing how the proposing supplier administers and manages a water treatment program.

The proposal response must include a sample of a hardcopy Administrative Notebook and its contents.

3.1.3.7 Business Reviews:

a. Quarterly: The supplier must submit a quarterly report at the end of the first three (3) months of any resulting contract and continue to submit quarterly reports thereafter. This report must:
    1) Detail recommendations for improvement in the University's monitoring and control of water treatment
    2) Present specific equipment deficiencies identified through inspections and service visits along with recommendations for correction
    3) Present specific procedural or system deficiencies and recommendations for correction
    4) Graphically and numerically present QCP data described in section 3.1.3.

b. Annual: The supplier must submit an annual report at the end of the first twelve (12) months of any resulting contract and at the end of each twelve (12) month period thereafter. This report must take the place of the Quarterly Business Review for the respective quarter and contain all data required for a Quarterly Business Review. In addition, the report must:
    1) State the yearly amounts and costs of chemicals proposed by the supplier in the initial proposal
    2) State the actual amounts and cost of chemicals used by the University during the preceding year
    3) Identify and explain any deviation(s) between proposed and actual usage.

The proposal response must include a sample of (1) a Quarterly Business Review and (2) an Annual Business Review report for a system with similar size and complexity.

3.1.3.8 Statistical Process Control: The supplier must be currently practicing statistical process control or equivalent in the manufacture of chemical products. In addition, suppliers must have a commercially available statistical process control program specifically designed for monitoring and trending the water chemistry test results from the boilers and cooling towers.

The proposal response must include a Specific Summary Statement (see note in section 6) detailing the proposing supplier's capability in these areas along with sample computer output of the manufacturing and commercially available SPC programs (Note: Other supporting

literature may be included).

3.1.3.9 Supplier Operation Start-up and Close-out: From the date of contract acceptance, supplier will have thirty (30) calendar days to deliver all necessary materials and equipment to specified locations, and have all chemical treatment processes fully operational. At the 30 day point, the supplier must provide a report to the University listing any outstanding items to complete the Start-up. At the date of contract termination, the supplier must remove all supplier-owned equipment and materials from University property within thirty (30) calendar days.

The proposal response must include an example of the proposed 30-day start-up and 30-day closeout plans for a system similar to the size and scope of that outlined herein.

3.1.4 University Equipment and Systems

3.1.4.1 University Systems: Detailed information concerning the University heating and cooling systems can be found in Appendix A. The supplier must utilize this information to determine program cost and preparation of the proposal response.

3.1.4.2 Feed and Control Equipment: The supplier must make recommendations to the University regarding chemical need(s) or control equipment required to assure reliable operation of the University's boiler, hot water, and cooling systems.

The proposal response must include a Specific Summary Statement (see note in section 6) detailing the proposing supplier's knowledge and capabilities regarding chemical feed and control systems.

3.1.4.3 System Modifications: The supplier must not change or alter existing equipment or any electrical circuits, wiring, controls or sequencing without written authorization from the University's Contract Administrator. If changes are authorized, all parts or components installed, or improvements made, by the supplier during the term of any resulting contract shall become and remain the property of the University.

3.1.4.4 Equipment Inspections and Reports:

a. Supplier representative must perform an internal inspection of the boilers and chillers annually when they are open for inspection by the University or at other unscheduled openings. A report must be provided to the university containing at a minimum:
    1) Digital photographs of equipment internals
    2) Findings of internal condition(s)
    3) Recommendation(s) to maintain or improve internal condition
    4) Carried forward findings with condition improvements or degradation as applicable

The University shall make every effort to notify the supplier of the inspection openings two weeks in advance. The inspection openings shall be scheduled to occur on Tuesdays to coincide with the regular supplier site visits.

The proposal response must include a sample written report to show general inspection criteria for boilers, cooling towers, and chillers in order to demonstrate technical ability of the proposing supplier and ability to obtain and operate necessary test equipment. Include photographs and parameters.

b. Supplier must perform visual internal cooling tower inspections (at least one cell per site) during each service visit and document deficiencies noted and recommendations in the weekly Service Report. No digital pictures are required for these inspections.

3.1.4.5 The supplier must deliver bulk chemicals between the hours of 8:00 am and 2:00 pm, Monday through Friday to the locations designated for the Central Plant systems and the Distributed Systems. For the Distributed Systems, bulk containers must be no larger than 105-gallon. Containers at remote locations must be no larger than 30 gallons. Bulk containers for the Distributed Systems must be located at the College of Textiles Building on Centennial Campus. The 30-gallon containers for remote locations must be delivered to the Facilities Warehouse, 621 Motor Pool Drive. All deliveries must have contact information for the university Building Maintenance and Operations Zone shop (hereafter referred to as

Zone shop) personnel on the packing slip. Refer to Section 3.3.2 for details on Distributed System bulk container specifications.

3.1.4.6 On-Hand Chemical Supplies: The supplier must maintain a 30-day supply of each chemical in inventory at each central utility plant location that is in operation and in each Zone shop location for the distributed systems.

3.1.4.7 Drum Handling and Proper Disposal: It is the supplier's responsibility to transport chemicals on campus and to dispose of all empty drums in accordance with all local, state and federal guidelines. Drums must be removed from the University immediately upon becoming empty. If drum or chemical becomes obsolete for any reason (expired chemical, failed tank, replaced system, etc.) it is the supplier's responsibility to remove both the chemical and the tank from the site.

The proposal response must include a Specific Summary Statement (see note in section 6) detailing the proposing supplier's chemical handling, delivery and disposal equipment and procedures.

3.1.5 **Monitoring, Testing and Laboratory Requirements**

3.1.5.1 Monitoring and Control: The supplier must provide a comprehensive chemical testing program with procedures for all control tests.

a. Laminated copies of all test procedures (specific to each system, analysis and plant) must be provided by the supplier and posted in the dedicated laboratory.
b. A binder must be provided by the supplier with all of the necessary test procedures.
c. Procedures must be updated as necessary by the supplier when tests, equipment, or systems change.

3.1.5.2 Supplier Laboratory Capabilities: The supplier must have laboratory facilities to perform a wide array of analytical work to facilitate monitoring, control and troubleshooting of the University's systems. The supplier must conduct all laboratory services. Subcontracted work or the use of independent laboratories is not allowed unless specifically authorized/approved by the University.

a. Laboratory services to be provided in the base cost include:
    1) Corrosion coupon analysis – Fifteen (15) sets of coupons every 120 days. A set is defined as one mild steel and one copper coupon.
    2) Water analysis
    3) Deposit analysis
    4) Differential microbiological analysis (DMA).

b. Laboratory services to be provided on a unit price (provided by supplier) include:
    1) Analex cartridge analysis
    2) Metallurgical analysis
    3) Legionella
    4) Softener elution study
    5) Softener resin analysis

The proposal response must include a Specific Summary Statement (see note in section 6) detailing the proposing supplier's capabilities in these areas.

3.1.5.3 Special Studies. Supplier must have the capability to perform the following:

a. Corrosion studies in cooling towers and closed loop systems
b. Oxygen studies in deaerators and boiler feedwater systems
c. Iron and corrosion studies in boiler condensate systems
d. Tower inhibitor tests, free chlorine tests, and dip slide analysis
e. Phosphate split testing

Tower inhibitor tests must be conducted with hand-held, portable fluorometers or equivalent method. Boiler internal treatment tests must be performed with hand-held, portable fluorometers or equivalent method.

The proposal response must include (1) a Specific Summary Statement (see note in section 6) detailing the proposing supplier's capabilities in these areas, (2) sample documents of

corrosion studies in cooling tower and closed loop systems, (3) a sample oxygen study for deaerators and boiler feedwater systems, and (4) a sample iron and corrosion studies in boiler condensate systems..

3.1.5.4 On-Site Microbiological Testing: The University will perform microbiological testing as necessary. Supplier must provide materials to perform quantitatively determined organism levels. The University will conduct these microbiological tests on each Central Plant tower system once per month between the months of October thru March and twice per month for the months of April thru September. These tests will be conducted quarterly on the chilled loop and annually on the hot water loops. The material cost must be included in the contract price.

The proposal response must include a Specific Summary Statement (see note in section 6) detailing the supplier's on-site microbiological testing capabilities.

3.1.5.5 Legionellosis: To ensure campus safety and to lessen the chances of a Legionellosis outbreak, the supplier must provide a pre and post disinfection procedure to be followed when performing cooling tower cleaning operations. There will not be any supplier Legionella testing for the Distributed Systems.

The proposal response must include (1) a Specific Summary Statement (see note in section 6) detailing the proposing supplier's Legionella testing capabilities, (2) recommended control parameters for Legionella bacteria.

3.1.5.6 Health and Safety: Supplier must provide Safety Data Sheets (hereafter referred to as SDS) to ensure a safe work environment for university and supplier personnel and to comply with all state and federal laws concerning the handling of hazardous materials. A SDS must accompany all first time orders and the supplier must operate a 24-hour, 7 day per week emergency phone number which can be called for emergency information regarding chemical spills and/or accidents involving supplier products. SDS's must be provided in hardcopy and electronic (pdf) forms for inclusion in the Administrative Notebooks and also be internet- accessible.

The proposal response must include (1) a Specific Summary Statement (see note in section 6) detailing the proposing supplier's SDS Program, (2) an emergency phone number and (3) SDS for all products recommended, including a summary list of ALL chemicals, by product name, and the applications for which the chemicals will be used (include chemicals for chemistry control AND local testing of water chemistry).

3.1.5.7 Product Bulletins: The supplier must provide product bulletins for all recommended products during the life of this contract.

The proposal response must include product bulletins for ALL recommended products (chemicals and local testing products) and a summary list of chemicals - by product name - and the applications for which the chemicals will be used.

3.2 Central Utility Plant - Scope of Work

3.2.1 **General Statements**

3.2.1.1 All specifications and requirements outlined in Section 3.1 General Scope of Work apply to the Scope of Work for the Central Utility Plant. The following items are specific to the Central Utility Plant.

3.2.1.2 Central Utility Plant Systems Data: The Central Utility Plant consists of central steam systems, central chilled water systems (including cooling towers and basin heating) and one (1) heating hot water loop. The existing equipment and planned expansions and additions are listed in Appendix A. Also listed are the production and consumption data for both the steam system and the chilled water system. This production and consumption data is provided for information only and is not to be considered an obligation by the University to duplicate this production or consumption during each year of any resulting contract.

3.2.1.3 Systems to be treated: The chemical treatment systems to be used for the steam systems, chilled water system, cooling tower systems and heating hot water loops are listed in Section 3.4. The control parameters that shall be the end result of the water treatment program are listed in Section 3.4.

3.2.2 **Pricing and Materials**

3.2.2.1 The Central Utility Plant Cost Proposal must consist of the following:

a. Firm price per 1,000 pounds (lbs) of steam produced
b. Firm price per 1,000 gallons of boiler make up water
c. Firm price per 1,000 gallons of hot water heating loop make up water
d. Firm price per 1,000 gallons of closed loop chilled water make up
e. Firm price per 1,000 gallons of cooling tower water make up
f. Firm price per 1,000 gallons of reuse cooling tower make up
g. One time water treatment system equipment cost for the steam boiler and hot water systems
h. One time water treatment system equipment cost for the chilled water and cooling tower systems
i. Published Equipment Price List including, but not limited to: tanks, pumps and pump accessories, controllers, test kits, handheld meters, and corrosion coupon racks (to be included in Cost Proposal section 7.1.1 “One Time Equipment Costs”).

There must be one unit price for each item (a) through (f) that will cover all Central Utility Plant systems. The one time water treatment system equipment costs (g and h), will cover all upgrades necessary for all central utility plants. Item (i) will be used for equipment replacement costs during the life of the contract if the supplier is chosen as the preferred provider.

3.2.2.2 New Services: As new central utility plants are commissioned, or new equipment is added to existing central utility plants, the unit price awarded will be used for water treatment services to the new facility.

3.2.2.3 Test Kits, Meters and Reagents: Test kits, reagents and handheld meters needed for monitoring of the water treatment systems must be provided by the supplier and included in each unit price for the term of any resulting contract. Initial test kits, handheld meters, and reagents necessary to begin the service must be included in the one-time water treatment system equipment cost.

3.2.2.4 Chemical Feed Pumps: The University will provide functioning chemical feed pumps at each location. The supplier must furnish all needed chemical tanks with integral secondary containment. The supplier must provide a separate price for any additional or different equipment that will be required to meter or dose the supplier’s chemicals (3.2.2.1 g & h above). This equipment must include any equipment required to utilize the supplier’s chemicals.

After the one time purchase of this equipment, any replacement equipment or repair parts needed during the life of the contract for operating the water treatment program are to be approved by the University and billed according to the published price list in section 3.2.2.1.(i) above. The University will make no separate equipment payment, other than the one time cost, without prior approval. Supplier must supply the equipment and as part of the cost, must assist the University with installation. All one-time purchase equipment will become the property of the university at the end of the contract.

3.2.2.5 Bulk Storage Tanks: Supplier must supply bulk storage tanks to all necessary chemical treatment applications outlined in this RFP. A list of current and planned tanks that must be provided by the supplier is shown in Appendix A. Supplier-owned bulk tanks must be constructed of polypropylene (hereafter referred to as PP), high density polyethylene (hereafter referred to as HDPE) or minimum 10-gauge stainless steel with bottom discharge to the pumps (10-gauge stainless tanks with PP or HDPE liners are also acceptable). It is the contractor’s responsibility to ensure that tank material(s) is(are) appropriately chosen for each chemical utilized. Sight gauges must be employed to allow drawdown. Secondary chemical containment must be provided. Supplier must retain ownership of tanks and must remove supplied tanks and chemicals at the end of the contract period. Bulk delivery of chemicals is the responsibility of the supplier. Chemical transport equipment must comply with Department Of Transportation (DOT) requirements for transporting hazardous material. Deliveries must be made by chemical handlers who are (1) certified in HAZMAT compliance (2) equipped with PPE on-site for delivery and transfer of chemical (3) equipped with items required to handle spills and any unexpected incidents. Supplier must retain ownership of the chemical inventory in the bulk tanks until the chemical is used, and usage must be billed as described in Section 4 of this RFP.

The proposal response must (1) indicate tank construction material for ALL recommended

products and (2) include a list of all tanks that will be employed at the various locations (plants and buildings) on campus. Appendix section A.1.3 "Central Plant Bulk Chemical Tank Inventory" provides a current list of all chemical tanks in the Central Utility Plants.

3.2.2.6 Corrosion Coupons: Supplier must provide corrosion coupons and a complete laboratory coupon analysis for each central utility chilled water system, cooling tower and condenser water system, heating hot water system, boiler feedwater system, and condensate system every 120 days for mild steel and copper. Laboratory reports must be sent directly to the University from the testing laboratory and not through the service representative. The University currently has coupon racks installed. After new construction, the University will install the coupon racks at locations agreed upon by the University and supplier.

3.2.3 **Supplier Services**

3.2.3.1 Site Visits: Supplier representative(s) must visit each Central Utility Plant every other Tuesday morning. During the site visits the following must be performed:

a. Each site visit:
    1) Conduct wet chemistry tests of the following systems at each applicable central plant to confirm University test results, document and adjust treatment levels:
        i. Boilers
        ii. Boiler feedwater
        iii. Condensate return
        iv. Softeners
        v. Cooling tower systems.
    2) Review of University test results for the prior two (2) weeks and trend report
    3) Review chemical inventory and inventory of lab supplies. Restock as needed.
    4) Review of University's microbiological testing as necessary
    5) Troubleshoot and provide special services to correct any problems/deficiencies
    6) Provide recommendations for corrective action as needed for improvement.
b. Once per month:
    1) Test the following closed water systems at each applicable central plant to document and adjust treatment levels:
        i. Chilled water loops
        ii. Heating hot water loops
        iii. Basin heating loops
    2) Conduct a visual inspection of cooling tower sumps, fill and distribution deck for signs of scale, corrosion, fouling or microbiological growth.
c. Quarterly:
    1) Conduct iron testing on each boiler feedwater and condensate system.
d. Representative must submit a Service Report for each site visit to include all items performed and/or inspected during the site visit.

3.3 Distributed System Scope of Work

The distributed systems are located in numerous buildings on all three (3) campuses. The supplier must utilize the information in Appendix A.2 to estimate chemical usages and to develop a cost proposal for treating these systems.

3.3.1 The University will provide functioning chemical feed pumps at each location and provide secondary containment platforms for chemical storage on site. The supplier is responsible for providing a separate one-time price for any additional or different equipment that will be required to meter or dose the supplier's chemicals. These prices for the boiler and chilled water systems must be listed in Section 7.2.2. This includes any equipment the university will need to utilize the supplier's chemicals.

After the one-time purchase of this equipment, any replacement equipment or repair parts needed during the life of the contract for operating the water treatment program are to be approved by the University and billed according to the published price list. The University will make no separate equipment payment, other than the one-time cost, without prior written approval. The supplier must supply the equipment and the University will provide the installation. All equipment will become the property of the University at the end of the contract.

The supplier must supply three (3) bulk storage tanks with unloading pumps for cooling tower treatment.

The bulk storage tanks will be located at the College of Textiles on Centennial Campus. Supplier-owned bulk tanks must be constructed of polypropylene or minimum 10-gauge stainless steel with flooded suction to the pumps. The pump must be an unloading type pump capable of full draw down for fill into five (5) gallon containers. Five gallon enclosed, spill proof containers must be provided by the supplier. Sight gauges must be provided on the tanks to measure draw-down. Secondary chemical containment must be provided. Supplier shall retain ownership of tanks and unloading pumps and must remove supplied tanks at the end of the contract period. Bulk delivery of chemicals must be provided by the supplier. Usage will be billed as described in Section 4 of this contract. The technical response must indicate tank construction material.

3.3.2 A supplier representative must visit each system as required to meet the following checks and inspections. The University will work with the supplier to develop an agreed upon schedule to meet the required checks and inspection frequencies.

System	Supplier Frequency
Water cooled chillers/Cooling Towers	1 x month during heating season (Oct – Mar) 2 x month during cooling season (Apr – Sept)
Steam Boilers	2 x month during heating season (Oct – Mar) 1 x month during cooling season (Apr – Sept)
Hot Water Boilers	1 x month
Closed loop hot water and chilled water loops	1 x year
Chiller & Boiler internal inspections	1 x year

The University will provide a single point of contact for communicating with the supplier to ensure all recommendations are implemented by University personnel. The supplier must visit each of the eight (8) Zone Shops to meet with a single point of contact for systems in that Zone. The supplier service technician must visit each equipment site to take samples. The following services must be performed:

a. Conduct wet chemistry tests of each system by the supplier to confirm University test results
b. Review University and previous supplier test results and trend analysis report
c. Troubleshoot and provide special services to correct any problems or deficiencies
d. Provide recommendations for corrective action as needed for improvement
e. Conduct a visual inspection of cooling tower sump, fill and distribution deck for signs of scale, corrosion, fouling or microbiological growth and document this inspection in the service report
f. Test closed chilled and hot water systems to document and take action for re-supply
g. University will inventory bulk tank levels weekly and document the tank levels in electronic format. The supplier must provide a Data Management Program and training. The supplier must request chemical deliveries based on the information provided by the University to ensure tanks are maintained at more than 50% level. The University will provide a contact person and phone number for PORTA FEED deliveries
h. Submit Service Report to include items (a) through (g) above as a minimum.

3.3.3 Test kits and reagents needed for operation of the water treatment system must be provided by the supplier and included in each unit price for the term of any resulting contract. Initial test kits and reagents necessary to begin the service are to be included in the one-time water treatment system equipment cost.

3.3.4 Base Bid. In the base bid, the supplier must meet all the requirements and scope of work items as listed in the RFP. For the Distributed systems, supplier must provide chemicals to maintain the parameters in the heating and cooling systems described in Section 3.4. The supplier must utilize the system descriptions and capacities as listed in that section and Appendix A.2 to estimate the quantity of chemicals required. The proposal response must provide the following information:

a. Name, description, concentration and other information about the chemicals proposed
b. Calculations utilized to determine the chemical quantities recommended
c. Estimated quantity of chemical required to meet parameters
d. Price per pound of chemical compounds proposed
e. Description of chemical feed system requirements if different from Section 3.3.1.

If the base bid is accepted, the supplier will be issued a purchase order in the amount of the unit prices for each chemical listed in the suppliers' price proposal. The University will purchase chemicals as

required, utilizing the unit price per pound of product provided in the cost proposal.

3.3.5 Alternate Bid—Distributed Systems

In the alternate for distributed boiler and cooling systems, the supplier must provide a fixed price to provide a complete water treatment program based upon the parameters in Section 3.4. If the alternate bid is accepted, the supplier will be issued a purchase order for a fixed amount. The University will pay the supplier monthly payments based on the fixed total yearly amount divided by twelve months. University will inventory bulk tank levels weekly and document the tank levels in electronic format. The supplier must provide a Data Management Program and training. The supplier must request chemical deliveries based on the information provided by the University to ensure tanks are maintained at more than 50% level. The University will provide a contact person and phone number for PORTA FEED deliveries. Requests for additional payments may be considered for items such as pipe breakage, and major losses from closed loop systems, improper operation of chemical controllers, major leakage from open water systems, and addition of equipment or systems not currently listed. During the Annual Business Review, any system that has not been maintained at the proposed level of treatment may be subject to a reduction in future payments for the period that the system was not in compliance.

3.4 Treatment Specifications

3.4.1 **Chilled Water Treatment Specifications**

3.4.1.1 Chemicals: Those necessary to treat the chilled water loop systems for scale, corrosion, microbiological growth and fouling. Chemicals must be completely compatible with present nitrite treatment program.

3.4.1.2 Corrosion Inhibitor: Supplier must furnish the chemicals necessary to achieve the following:

a. Maximum corrosion rate of 0.2 mils per year (mild steel) and 0.1 mils per year on yellow metals
b. Dispersion of iron and suspended solids
c. Produce no foam, under normal dosage levels
d. Buffer the pH level to maintain pH control between 8.5 – 10.5.

The above inhibitor must be a single product that is blended to provide all specific protections. The active ingredients include Nitrite, Azole, Polymer and buffering agents. Buffering agents shall not be carbonate-based. A dye may be present for leak detection.

3.4.2 **Cooling Tower Treatment Specifications**

3.4.2.1 Chemicals: Those necessary to treat the cooling tower/condenser water system for scale, corrosion, microbiological growth and fouling. Chemicals must be compatible with present treatment program. For reuse water treatment at the Centennial Campus Utility Plant, the program is not to include any acid adjustment for cycle control.

3.4.2.2 Scale and Corrosion Inhibitor: Treatment chemical must be a liquid non- chromate, organophosphonate that is capable of providing mild steel and copper corrosion inhibition and general dispersion of suspended solids. An inert fluorescent or equivalent tracer must be incorporated in the product to facilitate testing and to aid in leak detection.

3.4.2.3 Biocides: To prevent algae and microbiological growth in the tower and the condenser system and maintain microorganism level below <10,000 cfu per mil.

a. **Oxidizing**: a bromine-based formulation that maintains the halogen level. Non-stabilized halogens in either liquid or dry form must be dosed at a consistent level of 0.5-1.0 ppm Free Residual Oxidant (measured as Chlorine). Stabilized bromine products must be dosed to maintain a level of between 0.2 – 0.5 ppm Total Residual Oxidant (measured as Chlorine) for a minimum of 4 hours after slug dosing. For reuse water at the Centennial Campus Utility Plant, an activated bromine product must l be used.

b. **Non-Oxidizing**: Broad-spectrum back-up microbiocide that is active in a pH range of 7.5 to 9.0. Glutaraldehyde or Isothiazoline are acceptable. Isothiazoline must meet all storage container requirements and may not be pumped or handled by operators without proper training and Personal Protective Equipment (PPE). Isothiazoline neutralization kits must be

provided. Carbamates, quaternary amines, DBNPA, or MBT are not acceptable alternatives. For reuse water at the Centennial Campus Utility Plant, two non-oxidizing biocides (Gluteraldehyde and Isothiazoline) must be used.

3.4.2.4 Foam Control: If required, antifoam can be used as a preventive measure. Antifoam must consist of a fast acting liquid blend of surface active agents that will control and prevent foam.

3.4.2.5 pH Control: No acid will be used in the treatment program for pH control.

3.4.2.6 Cycles of Concentration: Cycles of concentration must be a minimum of eight (8) and a maximum of ten (10) with the exception of the Centennial Campus Utility Plant which uses City of Raleigh reuse water. Cycles of concentration for reuse water must be a minimum of two and one half (2.5) and a maximum of three and one half (3.5). Calculations for the purpose of bids must be conducted using 10 cycles and for reuse, use 3 cycles.

3.4.3 **Hot Water Treatment Specifications**

3.4.3.1 Chemicals: Those necessary to treat the hot water loop systems for scale, corrosion, microbiological growth and fouling. Chemicals must be completely compatible with present nitrite treatment program.

3.4.3.2 Corrosion Inhibitor: the supplier must furnish the chemicals necessary to achieve the following:

a. Maximum corrosion rate of 0.3 mils per year (mild steel) and 0.1 mils per year on yellow metals
b. Dispersion of iron and suspended solids
c. Produce no foam, under normal dosage levels
d. Buffer the pH level to maintain pH control between 8.5 – 10.5.

The above inhibitor must be a single product that is blended to provide all specific protections. The active ingredients include Nitrite, Azole, Polymer and buffering agents. Buffering agents shall not be carbonate-based. A dye may be present for leak detection.

3.4.4 **Chilled Water System Control Limits**
The following listed control limits must be the end result of treatment used:

3.4.4.1 Chilled water:

Total hardness (ppm CaCO3)	**<80 ppm**
Total iron (ppm Fe)	**<0.5 ppm**
Total copper (ppm Cu)	**<0.1 ppm**
pH at 77F	**8.5 - 10.5**
Microbiological	**<1,000 cfu/ml**

3.4.4.2 Cooling Tower Water:

Conductivity	**1900 - 2200 µmho***
pH	**7.5 - 9.0**
Cycles of Concentration	**8 - 10****
Total Alkalinity	**>200 ppm**
Chlorides	**<150 ppm**
Sulfates	**<350 ppm**
Microbiological	**<10,000 cfu/ml**

*All calculations for chemical consumption will be based on 2100 µmho neutralized conductivity. Assume make-up water is at 720 µmho.
**All calculations for chemical consumption will be based on ten (10) cycles of concentration.

For Cooling Tower Reuse Water at Centennial Campus Plant:

Conductivity	**1900 - 2100µmhos***
pH	**7.0 – 9.0**
Cycles of Concentration	**3 - 5****
M-Alkalinity	**<400 ppm**
Total P as PO4	**2-4 ppm**
Free chloride residual	**5-10 ppm**
Aerobic bacteria	**<1000 cfu/ml**
Chlorides	**<400 ppm**

*All calculations for chemical consumption will be based on 2100 µmho neutralized conductivity. Assume make-up water is at 720 µmho.
**All calculations for chemical consumption will be based on three (3) cycles of concentration.

3.4.5 **Boiler System Treatment Specifications**

3.4.5.1 Scale Inhibitor: The scale inhibitor must be a liquid polymer based formulation. The product must be a non-phosphate, non-chelate blend containing an iron dispersant. An inert fluorescent or equivalent tracer must be used to facilitate testing. Product must be in compliance with FDA 21 CFR 173.310, boiler water additives.

3.4.5.2 Condensate Treatment: Non-toxic, non-flammable, FDA-approved (reference FDA 21 CFR 173.310) treatment to prevent oxygen and carbonic acid corrosion within the condensate lines at pH levels between 8.2 and 8.8. A test must be provided for measuring actual treatment in the system.

3.4.5.3 Oxygen Scavenger: The oxygen scavenger must be a liquid blend of Sodium sulfite and a catalyst to speed reaction times. Product must be a minimum of 30% actives, and must comply with FDA 21 CFR 173.310, boiler water additives.

3.4.5.4 Alkalinity Adjustments: The alkalinity adjustment product must be a liquid, 50% freeze proof caustic formulation. The product must have a freeze point of no higher than 55 degrees Fahrenheit.

3.4.6 **Boiler System Control Limits**
The following listed control limits must be the end result of treatment used:

3.4.6.1 Boiler Feedwater:

Total hardness (ppm CaCO3)	**<0.5 ppm**
Total iron (ppm Fe)	**<0.1 ppm**
Total copper (ppm Cu)	**<0.5 ppm**
pH at 77F	**7.0 - 10.5**
Average TDS	**<50 ppm**

3.4.6.2 Boiler Water:

Conductivity	**2200 - 2500 µmho***
P-Alkalinity	**400 - 600 ppm**
M-Alkalinity	**<800 ppm**
OH Alkalinity	**200 - 400 ppm**
Chloride	**360 - 440 ppm**
Organic Polymer (measured as total product)	**200-400 ppm**
Sulfite	**30-60 ppm**
Silica	**<150**

*All calculations for chemical consumption will be based on 2400 µmho neutralized conductivity in the boilers.

3.5 Reporting Requirements

3.5.1 Reports required post award/prior to start of contract:

3.5.1.1 The supplier must submit Safety Data Sheets (hereafter referred to as SDSs) along with a complete listed inventory of SDSs for all products to be used on campus for the execution of the services described in this RFP.

3.5.1.2 The supplier must also submit SDSs, as prescribed in Federal Standard No. 313E for all hazardous material no later than five (5) days prior to delivery of material whether or not listed in Appendix A of the standard.

3.5.1.3 Jointly prepared (University and Supplier) inventory of all University-furnished pumps and meters. This list will be updated by the University.

3.5.1.4 Contact information for all supplier employees assigned to the contract and protocol that the University will use in contacting responsible employees of the supplier.

3.5.1.5 Inspection and testing schedules as required for each system, loop, or boiler. Indicate which test/inspections will be performed during and outside of normal working hours.

3.5.1.6 Quality Control Plan must be submitted to the contract administrator for approval a maximum of seven (7) calendar days prior to the start of any resulting contract.

3.5.1.7 University-designated personnel must be given access to online training (for review) within thirty (30) days of requested start date.

3.5.2 Reports required during the life of the contract:

(These reports must be provided to the Contract Administrator and appropriate Assistant Director)

Report	When Due
Initial Water Analysis	Within 15 calendar days of contract start date
Service Call Log	Monthly
Service Report	Twice a month on each distributed system Every other week at Central Utility Plants
Major Systems/Equipment not operating	Each Service Report
Corrosion Coupon Reports	Every 120 days

In addition, the supplier must provide any other reports required by the University during the term of the contract at no additional cost.

Note: Boiler and unfired pressure vessel inspections for certification are not included as a requirement of these specifications; however, the supplier will be required to provide technical assistance, expertise and dosage calculations as necessary when boilers and pressure vessels are reassembled and chemicals are replaced. Other assistance may be required during the inspection of pressure vessels and chiller barrels.

If the supplier fails to prepare and/or submit reports as specified, the University will assume that the work has not been performed and may withhold all payments until the required reports are satisfactorily completed.

3.6 University Provided Services

3.6.1 Central Utility Plant Service Support Activities

System	Daily	Weekly	Monthly	As Required
Towers	**Testing**: conductivity, pH, inhibitor, confirm on controller	**Testing**: after oxidizing biocide feed, free chlorine (3FRO) phosphate splits	**Mechanicals**: ensure cyclone separator on line and clean	**Leaks**: repair leaks if occur from blue tank valve forward
	Meters: record (where meters are available)	**Feed System**: ensure all pumps are primed and no leaks	**Testing**: dip slides	Tower disinfection and cleaning
		Mechanicals: clean strainers at controller and coupon rack, ensure flow		
		Mechanicals: clean BD strainer, exercise BD valve, ensure flow		
Closed Loops	**Meters**: record (where meters are available)		**Testing**: conductivity, pH, inhibitor	**Leaks:** see above
			Mechanicals: check pop off valves and ensure they are not leaking	Chiller inspections and cleaning. Eddy current testing
Steam Boilers	**Testing**: Softeners - total hardness	**Mechanicals**: confirm DA vent plume	**Testing:** iron	**Layup**: confirm boilers put into layup have water proper water levels and have sulfite and alkalinity boosted and BD is isolated
	Testing: Feedwater - conductivity, pH, total hardness, polymer			Softener salt
	Testing: Boilers - conductivity, sulfite, O-alkalinity			**Leaks:** see above
	Testing: Condensate - conductivity, pH, total hardness			Boiler inspections
	Meters: record (where meters are available)			
Administration		**Inventory**: record all tank levels		
Notes:	(1) All tests, meters, and tank levels logged in electronic format for trending (2) Access: Person to open doors (3) Delivery: Contact person and phone number for deliveries			

3.6.2 **Distributed Service Support Activities**

System	3x / Week	Weekly	Semi-Annual	As Required
Towers	**Testing**: conductivity, pH, inhibitor, confirm on controller	**Testing**: after ST70 feed, free chlorine (3FRO)	**Mechanicals**: ensure cyclone separator on line and clean	**Leaks**: repair leaks if occur from blue tank valve forward
		Feed System: ensure all pumps are primed and no leaks		
		Mechanicals: clean strainers at controller, ensure flow		
		Mechanicals: clean BD strainer, exercise BD valve, ensure flow		
Closed Loops			**Testing**: conductivity, pH, inhibitor	
			Mechanicals: check pop off valves and ensure they are not leaking	
Steam Boilers	**Testing**: Softeners - total hardness	**Mechanicals**: confirm DA vent plume		**Layup**: confirm boilers put into layup have water proper water levels and have sulfite and alkalinity boosted and BD is isolated
	Testing: Feedwater - conductivity, pH, total hardness, Polymer			
	Testing: Boilers - conductivity, sulfite, O-alkalinity			
	Testing: Condensate - conductivity, pH, total hardness			
Administration		**Inventory**: record all tank levels		
Notes:	(1) All tests, meters, and tank levels logged in electronic format for trending (Contractor will provide Data Management Program and training) (2) Access: Will need either provide a checked out key or person to open doors (3) Delivery: Contact person and phone number for deliveries			

3.6.3 University personnel will take the daily and monthly readings of the steam and makeup water meters in the centralized plants.

3.6.4 University personnel will calibrate the central plant steam flow meters on an annual basis.

3.6.5 University Maintenance zones employees will have daily oversight over the distributed systems and make periodic chemical analysis adjustments.

3.6.6 University Central Utility Plant employees will have daily oversight over the central utility plant systems and make periodic chemical analysis adjustments.

3.7 VENDOR BILLING

3.7.1 Central Utility Plants Billing

3.7.1.1 Invoiced amounts for the Central Utility Plants must be quoted and accepted fixed price per:

a. 1,000 pounds of steam generated based upon the CUP Monthly Report
b. 1,000 gallons of boiler makeup water based upon the CUP Monthly Report
c. 1,000 gallons of hot water heating loop make up water based upon CUP Monthly Report
d. 1,000 gallons of closed loop chilled water make up water based upon CUP Monthly Report
e. 1,000 gallons of cooling tower make up water based upon CUP Monthly Report
f. 1,000 gallons of reuse water make up at Centennial Plant based upon CUP Monthly Report

Items a, b, c, d, e and f will be based upon installed plant metering and/or estimations utilized in the event of a meter failure. If the installed plant metering is not functioning properly, estimation will be made and agreed upon by the University and the supplier.

3.7.1.2 Monthly payments for the Central Utility Plant systems will be based upon prices quoted and monthly meter readings taken by the University's Facilities Central Utility plant staff. It is the supplier's responsibility to obtain the monthly readings from the central utility plant staff for steam production, and make up water use at each of the central utility plants. These meter readings must be listed on each of the monthly invoices showing current and previous reading, production and consumption, and cost for each central utility plant system. Steam production must be listed by boiler number under each plant and also show current reading, previous reading, production and cost for each plant for 1,000 pounds of steam produced. makeup water is to be listed by process for each central plant.

3.7.1.3 As new central utility plants are commissioned or new equipment is added to existing central plants, the unit prices provided in the proposal response will be used for new water treatment services for these facilities and be billed on a monthly basis during the term of the contract.

3.7.1.4 New buildings and/or piping added to the Central Utility Plant system loops may be treated from the central utility plants as opposed to on-site. If this is performed, the Central Utility Plant staff will inform the supplier to provide a separate invoice for a specific volume of water treated. This will be used by the Central Utility Plant staff for billing the campus project.

3.7.2 Distributed System Billing

3.7.2.1 The invoicing for the distributed system for product delivered will be based upon the fixed price per pound quoted in the distributed system description and invoiced after delivery.

3.7.2.2 The invoiced amount for the distributed system must be based upon the fixed price quoted to treat all the systems listed if alternate 1 is selected. Payment will be made monthly.

3.7.2.3 As existing distributed systems are decommissioned, the supplier will be requested to provide a reduction in price if the Alternate Bid for Distributed Systems is chosen.

3.7.2.4 Exception to price format: the provision of resin cleaners and fuel oil additives will be by the per pound or per gallon whichever is applicable and is not to be included in the cost proposal where requested as per 1,000 gallons of makeup water or per 1,000 pounds of steam produced. All necessary clean up chemicals are to be included in the cost format; however, this would include descalers, anti-foam, neutralizers, stabilizers and polymerics in addition to the original proposal.

Note: Quarterly Business Reviews and Annual Reviews (section 3.1.3.7) will be held and the Supplier must attend these with the University's Director's for Building M&O and Utilities Services. During

these reviews, the University may consider additional requests for payment from the supplier. Additional payment requests may be considered for items such as pipe breakage and major chemical loss from closed loop systems, improper operation of chemical controllers, major leaks from open water systems, and additional equipment or systems not included in this RFP.

4. SUPPLIER QUALIFICATION/EXPERIENCE REQUIREMENTS

4.1 Criteria to establish the responsibility and capability of firms to meet the University's requirements.

Please provide sufficient information regarding each of the following items below to allow for a thorough evaluation of the proposing supplier's abilities. Supporting literature and attachments to the summaries requested below may be included in the proposal response.

4.1.1 Supplier Experience. The supplier must be normally engaged in treating water for boiler and cooling systems. A minimum of three years' experience is required on projects similar in nature and scope to NC State University's campus. References and literature provided must verify the required experience.

The proposal response must include a Specific Summary Statement (see note in section 6) detailing the proposing supplier's capabilities and experience with similar water treatment systems on city water and reclaim/reuse water treatment systems.

4.1.2 Financial Submittal.

The proposal response must include the previous year's annual report, audited financial statement or equivalent to provide reasonable assurance of the proposing supplier's financial stability.

4.1.3 Representative Experience: The representatives provided must demonstrate a minimum of two (2) years' experience at facilities similar in nature and scope to the NC State University system.

The proposal response must include a list of names, educational backgrounds, years in water treatment industry, and years and type of experience for the three (3) appointed representatives.

4.1.4 References: It is the supplier's responsibility to provide valid reference information, and the University reserves the right to use reference check responses in its evaluation of technical proposals.

The proposal response must include a list of three (3) present customers in the surrounding area, handled by the representatives named in 5.1.3. At least two (2) of these references must have systems similar in nature and scope to those outlined herein.

4.1.5 Service Level and Response Times: Two (2) of supplier's representatives must live within two (2) hours driving distance of the University. A representative must perform a service visit at a minimum of once every other week and perform services as outlined in Sections 3.2 and 3.3. The representatives must be available for telephone calls on specific problems should they occur. Telephone calls must be returned within four (4) hours. The representatives must be available to the University on 24-hour notice, and under emergency circumstances, must be able to visit the campus within four (4) hours of telephone notification.

The proposal response must include a Specific Summary Statement (see note in section 6) detailing your company's ability to meet this requirement.

4.1.6 Subcontractors: The supplier is responsible for the quality of the products and services provided by the subcontractors. No portion of the work may be subcontracted without the University's knowledge and written authorization. See item #5 of General Contract Terms and Conditions.

The proposal response must include a list of subcontractors that the proposing supplier plans to use to fulfill the requirements of the RFP.

4.1.7 Supplier Safety Record:

The proposal response must include documentation of the firm's Total Recordable Injury rate.

This is the number of work-related injuries per 100 full-time employees per year.

5. SUPPLIER PROPOSAL RESPONSE

The following information is required in response to this RFP. Failure to adequately provide specific information that can be effectively evaluated by NC State may disqualify your proposal from consideration.

At minimum, the proposal response package must include the following and must be uploaded in the corresponding locations on Bonfire:

1. Completed NC State University RFP
    - Cover Page with Firm Name and Tax ID#
    - Reference page
    - Signed Execution of Proposal page

2. A **detailed** technical proposal addressing **Sections 3 and 4**. Responses must be numbered to match the corresponding RFP items followed by your acknowledgment or a response demonstrating how you meet the requirement. Items requiring a "Specific Summary Statement" must be provided in a separate document, clearly and concisely addressing the requested information, independent of product literature. Follow the RFP's order when presenting information.

   In your proposal, outline the approach, processes, and steps you will take to complete the Scope of Work. Include any recommended additional tasks, along with any requirements or assumptions that may affect your approach or timeline.

   Specific Summary Statements for each of the sections below:

Section	Title
3.1.3.1	Quality Control Program
3.1.3.2	Supplier Representatives (background checks)
3.1.3.5	Training
3.1.3.6	Program Administration
3.1.3.7	Business Reviews
3.1.3.8	Statistical Process Control
3.1.3.9	Supplier Operation Start-up and Close-out
3.1.4.2	Feed and Control Equipment
3.1.4.4	Equipment Inspection and Reports
3.1.4.7	Drum Handling and Proper Disposal
3.1.5.2	Supplier Laboratory Capabilities
3.1.5.3	Special Studies
3.1.5.4	On-Site Microbiological Testing
3.1.5.5	Legionella
3.1.5.6	Health and Safety
3.1.5.7	Product Bulletins
3.2.2.5	Bulk Storage Tanks
4.1.1	Supplier Experience
4.1.2	Financial Submittal
4.1.3	Representative Experience
4.1.4	References
4.1.5	Service Level and Response Time
4.1.6	Subcontractors
4.1.7	Total Recordable Injury Rate
7.3	Alternate Bid Descriptions Only (7.3.1-7.3.6)

3. Section 7 Costs & Questions Spreadsheets:

    - Section 7.1 - 7.3 Costs (BT-06BW)
    - Section 7.2 Distributed System Product Costs (BT-58HT)
    - Section 7.2 Distributed System Product Questions (Q-47UW)

4. Section 7 Cost Proposal Additional Information:
    - 7.1 - 7.3 Additional Cost Illustrations
    - 7.1.1 Equipment Price List
    - 7.3.3 - 7.3.7 Alternate Bid Descriptions
5. ACORD Certificate of Insurance (see Terms and Conditions for required coverage, Item #19), listing holder:

    NC State University
    Procurement Services
    2721 Sullivan Drive
    Raleigh, NC 27695

6. Any applicable RFP addenda subsequent to this RFP that is required for return by statement on the addendum.

Note: Incomplete proposals will not be considered for award.

6. CRITERIA FOR EVALUATION AND AWARD

SCREENING CRITERIA: All items requested are included in the response package and submitted as instructed. All files are transmitted to the Bonfire site without password or other lockdown requirements Incomplete responses will not be considered further.

Proposals meeting the screening criteria will then be further evaluated by the following weighted criteria in order to select the Supplier providing the best overall value to the department requesting these services:

30% Qualifications & Experience - **Section 4**
Assurance that the proposing supplier has the personnel, experience, references, and expertise to carry out the required service. Required certifications are confirmed.

30% Capability to meet the Requirements - **Section 3**
Compliance with the stated RFP specifications and requirements.

5% Financial Viability - **Section 4.1.2**
Financial submittal indicates reasonable assurance of financial stability. Recent audited financial statements or similar evidence of financial stability must be provided.

35% Cost Proposal **- Section 7**
The total cost to the University for the initial contract period (to include alternate selections of the University will be considered). Cost scores are calculated by dividing each score into the lowest total cost proposal total cost x 35. Lowest cost proposal receives all of the 35 available points. The remaining proposals scores are calculated by dividing their cost into the low cost and multiplying that result by 0.35.

EXAMPLE
Supplier A's proposed total cost = 150,000
Supplier B's proposed total cost = $200,000
Supplier C's proposed total cost = **$100,000 (lowest total cost proposed)**

Cost scores would be calculated as follows:
Supplier C: (**100,000**/100,000) x 35 = 35 points
Supplier B: (**100,000**/200,000) x 35 = 17.5 points
Supplier A: (**100,000**/150,000) x 35 = 23.33 points

The RFP will be awarded based on the best overall value to the University as is determined by the scoring each proposal response in accordance with the Evaluation Criteria listed above. Note that this evaluation method does not bind the University to the low bid.

7. COST PROPOSAL

The cost to the University to provide items listed. This cost must include all labor, transportation, tools, equipment, software, expenses (travel and otherwise), and any other cost incurred by the firm. All costs must be outlined and uploaded separately from your technical proposal.

You must download and complete all spreadsheets associated with Section 7. Incomplete or missing information may result in the rejection of your entire proposal. If the provided spreadsheets do not accommodate all necessary details, you may upload a separate document to illustrate your cost proposal as indicated in Section 5.

7.1 Central Utility Plant Water Treatment Cost Rates

Provide water treatment services to the central steam plants for the following systems as described in Appendix A and meeting the Scope of Work and Treatment Specifications outlined in Section 3.

Description	Unit Cost	Unit of Measure		Quantity			Extended Costs
Steam		/1000 lbs steam	X	**1,020,000**	(1000 lbs)	=	
Boiler Make Up Water		/1000 gal make up	X	**33,600**	(1000 gal)	=	
Hot Water Heating Loop Make Up Water		/1000 gal make up	X	**13**	(1000 gal)	=	
Chilled Water Make Up Water		/1000 gal make up	X	**425**	(1000 gal)	=	
Cooling Tower Make Up Water		/1000 gal make up	X	**79,000**	(1000 gal)	=	
Reuse, Tower Make Up Water		/1000 gal make up	X	**60,000**	(1000 gal)	=	
Annual Total Cost for Water Treatment Program:							

7.1.1 One-time Equipment Costs:

Description	Unit Cost
Boiler and Hot Water System Water Treatment Equipment Cost	
Chilled Water System Water Treatment Equipment Cost	
*****Equipment Price List must be uploaded separately from your technical response and described as outlined below and in accordance with section 3.2.2.1 (i)*****	
Controllers: The supplier must provide a fixed per-unit cost for replacement of cooling tower and boiler controllers. Controller must have digital readout and interface with manual on/off available through keypad. Unit must have web-based communication capabilities and must have a password lockout feature. Please submit product brochures for recommended controllers.	
Pumps: The supplier must provide a fixed per-unit cost for replacement of chemical feed pumps. Selected new pumps must meet or exceed performance of existing pumps or system requirements. Submit product brochures for recommended pumps.	

7.2 Distributed System Product Costs and Questions:

To provide water treatment services to the distributed systems as described in Appendix A.2 and meeting the Scope of Work and Treatment Specifications outlined in Section 3.

Description	Unit Cost	Unit of Measure		Quantity Required	Unit of Measure		Extended Costs
Oxygen Scavenger		/lb of product	X		lbs of product	=	
Scale and Corrosion Inhibitor		/lb of product	X		lbs of product	=	
Alkalinity Adjustment		/lb of product	X		lbs of product	=	
Condensate Treatment		/lb of product	X		lbs of product	=	
Chilled Water Inhibitor		/lb of product	X		lbs of product	=	
Biocide #1		/lb of product	X		lbs of product	=	
Biocide #2		/lb of product	X		lbs of product	=	
Condenser Water Treatment		/lb of product	X		lbs of product	=	
Heating Water Inhibitor		/lb of product	X		lbs of product	=	
Annual Total Cost for Water Treatment Program:							

7.2.1 **One-time Equipment Costs:** This is a one time, up front charge. Will require change out of the existing Nalco 3D Trasar unit controllers.

Description	Unit Costs
Boiler System Water Treatment Equipment Cost	
Chilled Water System Water Treatment Equipment Cost	

7.2.2 **Distributed Boiler Systems**

Oxygen Scavenger	**Name/Number**	
	Generic Type	
	ppm product required per 1 ppm **Oxygen** in feedwater	
	ppm product required per 1 ppm residual in feedwater	
	price per pound of product	
Scale and Corrosion Inhibitor	**Name/Number**	
	Generic Type	

	ppm product required per 1 ppm **Hardness** in feedwater	
	ppm product required per 1 ppm residual in feedwater	
	price per pound of product	
Alkalinity Adjustment	**Name/Number**	
	Generic Type	
	ppm product required to raise **O-Alkalinity** 1 ppm	
	price per pound of product	
Condensate Treatment	**Name/Number**	
	Generic Type	
	ppm product required per 1 ppm **CO2**	
	price per pound of product	

7.2.3 **Distributed Cooling System**

Chilled Water Inhibitor	**Name/Number**	
	Generic Type	
	ppm product required in system to achieve target ppm	
	price per pound of product	
Biocide #1 (oxidizing)	**Name/Number**	
	Generic Type	
	% active ingredients	
	planned dosage frequency	
	dosage to achieve expected concentrations	
	pounds per 1,000 gallon system volume	
	price per pound of product	
Biocide #2 (non-oxidizing)	**Name/Number**	
	Generic Type	
	% active ingredients	
	planned dosage frequency	

	dosage to achieve expected concentrations	
	pounds per 1,000 gallon system volume	
	price per pound of product	
Condenser Water Treatment	**Name/Number**	
	Generic Type	
	ppm product required in system to achieve treatment target	
	ppm of product residue when system target treatment is achieved	
	price per pound of product	

7.2.4 **Distributed Heating Hot Water Loops**

Heating Water Inhibitor	**Name/Number**	
	Generic Type	
	ppm product required in system to achieve target ppm	
	price per pound of product	

7.3 Alternate Bids

Submit proposals that address each of the alternate bids listed below. The selection of which alternate bids that are accepted will be determined as those that are deemed to be in the best interest of the University. The alternate bids will be evaluated based on content and benefit to the University and weighed against the cost of each. The aggregate cost of the alternate bids selected will be included in the basis for award. The University reserves the right to accept or reject any or all alternate bids submitted. **Omission of any alternate bid will result in rejection of the entire proposal.**

7.3.1 **Alternate 1: Central Utility Plant Lump Sum Price**
Provide water treatment services for the following:

Unit Cost per rated ton to perform a cooling tower thermal performance evaluation	**$ /ton**
Unit Cost per rated ton to perform a chiller efficiency evaluation	**$ /ton**
Unit Cost per rated PPH capacity to perform a deaerator performance test	**$ /PPH**
Unit Cost per GPM to perform a softener elusion study	**$ /GPM**

7.3.2 **Alternate 2**: **Distributed System Lump Sum Price**
Provide water treatment services for the distributed systems described in Appendix A.

$	per twelve (12) months to be billed at	**$**	per month for the duration of the contract (reference section 3.3.2)

7.3.3 **Alternate 3**: Water Conservation (description only)

The supplier must provide a scope and detailed description of actions to be taken under the alternate to identify, evaluate, and implement modifications and/or changes to equipment or to operating procedures associated with the thermal utilities, to promote the conservation of water and sewer services purchased from the City of Raleigh. At a minimum, the supplier will provide a detailed description of the action(s), its location(s), line item first cost, expected savings, and a return on investment for each action. All cost necessary to implement the action must be borne by the supplier under the alternate. The proposal will be evaluated based on ease of implementation, feasibility, initial cost, return on investment, and level of detail and quality.

7.3.4 **Alternate 4**: Energy Conservation (description only)
The supplier will provide a scope and detailed description of actions to be taken under the alternate to identify, evaluate, and implement modifications and/or changes to equipment or to operating procedures associated with the thermal utilities, to promote the conservation of purchased energy from the local utilities. At a minimum, the supplier will provide a detailed description of the action(s) its location(s), line item cost to implement, expected savings, and a return on investment for each action. All cost necessary to implement the action must be borne by the supplier under the alternate. The proposal will be evaluated based on ease of implementation, feasibility, initial cost, return on investment, and level of detail and quality.

7.3.5 **Alternate 5**: Sustainable Operating Practices (description only)
The supplier will provide a scope and detailed description of actions to be taken under the alternate to identify, evaluate, and implement modifications and/or changes to equipment or to operating procedures associated with the thermal utilities, to promote sustainable (Green) operating practices. At a minimum, the supplier will provide a detailed description of the action(s). All cost necessary to implement the action must be borne by the supplier under the alternate. The proposal will be evaluated based upon ease of implementation, feasibility, initial cost, return on investment, and level of detail and quality.

7.3.6 **Alternate 6**: Training – University Plant Engineer (description only)
The supplier must provide a scope and detailed description of off-site training in all pertinent aspects of water treatment chemistry that may be attended by the University's Plant Engineer or other University personnel. All cost associated with travel, registration, room, board, and training materials must be included in the alternate. Training per person must be for a minimum of three days at the supplier's home office and must include classroom instruction, lab demonstrations, and field testing. The proposal will be evaluated based on ease of implementation, feasibility, initial cost, return on investment, and level of detail and quality.

7.3.7 **Alternate 7**: Technical Innovation (description only)
The supplier must describe notable research advancements in the area of process water treatment. Practical cost-savings technologies must be highlighted, particularly when applicable to the University.

See attached Appendices

A EQUIPMENT/SYSTEM INVENTORY
B EXAMPLE QUALITY CONTROL PROGRAM

Supplier Name: _____ **RFP #63-KGS1092553**

4.1.4 REFERENCES

OFFERORS MUST PROVIDE THREE (3) REFERENCES FOR CLIENTS WHO HAVE PERFORMED SIMILAR WORK IN THE PAST THREE (3) YEARS.

#1	**Company Name:**	
	Company Full Address:	
	Contact Name:	
	Email Address:	
	Phone Number:	

#2	**Company Name:**	
	Company Full Address:	
	Contact Name:	
	Email Address:	
	Phone Number:	

#3	**Company Name:**	
	Company Full Address:	
	Contact Name:	
	Email Address:	
	Phone Number:	

THIS PAGE MUST BE COMPLETED AND SUBMITTED AS A PART OF YOUR PROPOSAL.

EXECUTION OF PROPOSAL **RFP #63-KGS1092553**

The potential Contractor certifies the following by placing an "X" in all blank spaces:

- ☐ That this proposal was signed by an authorized representative of the firm.
- ☐ That the potential Contractor has determined the cost and availability of all materials and supplies associated with performing the services outlined herein.
- ☐ That all labor costs associated with this project have been determined, including all direct and indirect costs.
- ☐ That the potential Contractor has attended the pre proposal conference and is aware of the prevailing conditions associated with performing these services.
- ☐ That the potential Contractor agrees to the conditions as set forth in this Request for Proposals with no exceptions.
- ☐ That the potential Contractor carries the appropriate insurance and will perform background checks on employees as required herein. See items 19 & 31 of General Contract Terms and Conditions attached.
- ☐ That no employee or agent has offered, and no State employee has accepted, any gift or gratuity in connection this contract, in violation of N.C.G.S. § 133-32; and
- ☐ That it, and each of its sub-contractors under this contract, complies with the requirements of Article 2 of Chapter 64 of the NC General Statutes, including the requirement for each employer with more than 25 employees in North Carolina to verify the work authorization of its employees through the federal E-Verify system, as required by G.S. §143-48.5.
- ☐ That this proposal is submitted competitively and without collusion. That none of our officers, directors, or owners of an unincorporated business entity has been convicted of any violations of Chapter 78A of the General Statutes, the Securities Act of 1933, or the Securities Exchange Act of 1934 (G.S. 143-59.2), and that we are not an ineligible supplier as set forth in G.S. 143-59.1. False certification is a Class I Felony.

Therefore, in compliance with the foregoing Request for Proposal, and subject to all terms and conditions thereof, the undersigned offers and agrees, if this proposal is accepted within sixty (60) days from the date of the opening, to furnish the services for the prices quoted during any resulting contract period.

Contractor Name:			
Street Address:			
City, State & Zip Code:			
Representative's Name:			
Representative's Title:			
Representative's Email:		**Phone#:**	
Representative's Signature:		**Date:**	

THIS PAGE MUST BE COMPLETED AND INCLUDED IN YOUR PROPOSAL RESPONSE

GENERAL INFORMATION ON SUBMITTING PROPOSALS

1. **EXCEPTIONS:** All proposals are subject to the terms and conditions outlined herein. All responses shall be controlled by such terms and conditions and the submission of other terms and conditions, price lists, catalogs, and/or other documents as part of an offeror's response will be waived and have no effect either on this Request for Proposals or on any contract that may be awarded resulting from this solicitation. Offeror specifically agrees to the conditions set forth in the above paragraph by signature to the proposal.

2. **PROPOSAL SUBMITTAL**: NC State University uses a third-party eProcurement strategic sourcing provider, Bonfire, for accepting and evaluating proposals digitally. All proposals must be received by the issuing agency not later than the date and time listed on the cover sheet of this proposal. Proposals shall be uploaded to:

   https://ncsu.bonfirehub.com/opportunities/188974

   Request for Proposals (RFP) documents are advertised on the State of North Carolina Electronic Vendor Portal System (eVP) and Bonfire. An addendum to this RFP may be issued. If required, any subsequent addenda must be signed and submitted with the proposal upload. It is the **vendor's responsibility** to verify that all applicable addenda are submitted as required.

   For support or technical questions related to your submission, please contact Bonfire at support.bonfire@eunasolutions.com or visit their help forum at https://vendorsupport.gobonfire.com/hc/en-us

3. **BONFIRE REQUESTED DOCUMENTATION & INFORMATION:** Elaborate proposals in the form of brochures or other presentations beyond that necessary to present a complete and effective proposal are not desired. In an effort to support the sustainability efforts of the State of North Carolina we are receiving proposals via electronic submission.

   Please note the type and number of files allowed. The maximum upload file size is 1000 MB. Uploading large documents may take significant time, depending on the size of the file(s) and your Internet connection speed. Please do not embed any documents within your uploaded files, as they will not be accessible or evaluated. Minimum system requirements: Microsoft Edge, Google Chrome, or Mozilla Firefox. Javascript must be enabled. Browser cookies must be enabled.

Name	File Type	# of Files	Requirement
Completed NC State University RFP Document	PDF	1	Required
Technical Proposal	PDF	1	Required
Section 7 Cost Proposal	BidTable: Excel (.xlsx)	Multiple	Required
Certificate of Insurance	PDF	1	Required

   All documents required to complete your submission must be downloaded from the supporting documentation and/or requested information sections of Bonfire. You will receive an email confirmation receipt with a unique confirmation number once you finalize your submission. **Each item of Requested Information will only be visible to NC State University after the Closing Time.**

4. **ORAL PRESENTATIONS:** During the evaluation and at their option, the evaluators may request oral presentations from any or all offerors for the purpose of clarification or to amplify the materials presented in any part of the proposal. However, offerors are cautioned that the

evaluators are not required to request clarification; therefore, all proposals should be complete and reflect the most favorable terms available from the offeror.

5. **PROPOSAL EVALUATION:** Proposals will be evaluated as outlined herein. The award of a contract to one offeror does not mean that the other proposals lacked merit, but that, all factors considered, the selected proposal was deemed to provide the best value to the University, and/or the State.

6. **COMMENCEMENT OF SERVICES:** After proposals are evaluated, and an offer is made, accepted and approved by appropriate authorities, the University will issue a purchase order, a contract or a letter of agreement as an indicator to commence services.

7. **REQUEST FOR OFFERS:** Offerors are cautioned that this is a request for offers, not a request to contract and the University/State reserves the unqualified right to reject any and all offers when such rejection is deemed to be in the best interest of the University or State.

8. **ORAL EXPLANATIONS:** The University shall not be bound by oral explanations or instructions given at any time during the competitive process or after award.

9. **REFERENCE TO OTHER DATA:** Only information which is received in response to this RFP will be evaluated; reference to information previously submitted shall not be evaluated.

10. **COST FOR PROPOSAL PREPARATION:** Any costs incurred by offerors in preparing or submitting offers are the offerors' sole responsibility; the University will not reimburse any offeror for any costs incurred prior to award.

11. **TIME FOR ACCEPTANCE:** Each proposal shall state that it is a firm offer which may be accepted within a period of sixty (60) days from the proposal opening. Although the contract is expected to be awarded prior to that time, the 60-day period is requested to allow for unforeseen delays.

12. **TITLES:** Titles and headings in this RFP and any subsequent contract are for convenience only and shall have no binding force or effect.

13. **CONFIDENTIALITY OF PROPOSALS:** In submitting its proposal the offeror agrees not to discuss or otherwise reveal the contents of the proposal to any source outside of the using or issuing agency, government or private, until after the award of the contract. Offerors not in compliance with this provision may be disqualified, at the option of the State, from contract award. Only discussions authorized by the University are exempt from this provision.

14. **RIGHT TO SUBMITTED MATERIAL:** All responses, inquiries, or correspondence relating to or in reference to the RFP, and all other reports, charts, displays, schedules, exhibits, and other documentation submitted by the offerors shall become the property of the State when received.

15. **OFFEROR'S REPRESENTATIVE:** Each offeror shall submit with its proposal the name, address, and telephone number of the person(s) with authority to bind the firm and answer questions or provide clarification concerning the firm's proposal.

16. **PROPRIETARY INFORMATION:** To the extent permitted by N.C.G.S. §132-1.3 trade secrets which the Contractor does not wish disclosed other than to personnel involved in the evaluation or contract administration will be kept confidential identified as follows: Each page shall be identified in boldface at the top and bottom as "CONFIDENTIAL". Any section of the proposal which is to remain confidential shall also be so marked in boldface on the title page of that section. Cost information is not confidential. In spite of what is labeled as confidential, the determination as to whether or not it is shall be determined by North Carolina law.

17. **HISTORICALLY UNDERUTILIZED BUSINESSES:** Pursuant to N.C.G.S. §143-48 and Executive Order #150, the University invites and encourages participation in this procurement process by businesses owned by minorities, women, disabled, disabled business enterprises and non-profit work centers for the blind and severely disabled.

18. **PROTEST PROCEDURES:** A party wanting to protest a contract award pursuant to this solicitation must submit a written request to the Director of Purchasing, North Carolina State University, Purchasing Department, Campus Box 7212, Raleigh, NC 27695-7212. This request must be received in the University Purchasing Department within thirty (30) consecutive calendar days from the date of the contract award, and must contain specific sound reasons and any supporting documentation for the protest. NOTE: Contract award notices are sent only to those actually awarded contracts, and not to every person or firm responding to this solicitation. Offerors may call the purchaser listed on the first page of this document to obtain a verbal status of contract award. All protests will be handled pursuant to the North Carolina Administrative Code, Title 1, Department of Administration, Chapter 5, Purchase and Contract, Section 5B.1519.

19. **CONTRACTOR REGISTRATION AND SOLICITATION NOTIFICATION SYSTEM:** Contractor Link NC allows Contractors to electronically register free with the State to receive electronic notification of current procurement opportunities for goods and services available on the Electronic Vendor Portal System. Online registration and other purchasing information are available on the web site: http://www.state.nc.us/pandc/.

20. **RECIPROCAL PREFERENCE:** N.C.G.S. §143-59 establishes a reciprocal preference law to discourage other states from applying in-state preferences against North Carolina's resident offerors. The "Principal Place of Business" is defined as the principal place from which the trade or business of the offeror is directed or managed.

21. **ENTERPRISE-LEVEL IT SYSTEMS OR TECHNOLOGIES:** The University is committed to promote and integrate universal IT accessibility in the delivery of its resources and to develop innovative solutions to accessibility challenges for students, faculty and staff. Contractors shall:

    a. Assure all features, components and subsystems of the software or IT System contained on this RFP **fully comply** with Section 508 of the Rehabilitation Act of 1973, as amended (29 U.S.C.794d), (http://www.section508.gov);

       OR

       Detail why any feature, component or sub-system contained in this RFP does not **fully comply** with Section 508, and the way in which the proposed product is out of compliance;

    b. If the Voluntary Product Accessibility Templates (VPAT) (https://www.itic.org/policy/accessibility/vpat) are used, they must include compliance checklists for:
       1. Technical Standards;
       2. Function and Performance Criteria; and
       3. Documentation and Support

    c. The product offered in response to this RFP is subject to an accessibility evaluation by the University.

NORTH CAROLINA STATE UNIVERSITY GENERAL CONTRACT TERMS AND CONDITIONS

(Contractual and Consultant Services)

1. **GOVERNING LAW:** This contract is made under and shall be governed and construed in accordance with the laws of the State of North Carolina.

2. **SITUS:** The place of this contract, its situs and forum, shall be Wake County, North Carolina, where all matters, whether sounding in contract or tort, relating to its validity, construction, interpretation and enforcement shall be determined.

3. **INDEPENDENT CONTRACTOR:** The Contractor shall be considered to be an independent contractor and as such shall be wholly responsible for the work to be performed and for the supervision of its employees. The Contractor represents that it has, or will secure at its own expense, all personnel required in performing the services under this agreement. Such employees shall not be employees of, or have any individual contractual relationship with the University.

4. **KEY PERSONNEL:** The Contractor shall not substitute key personnel assigned to the performance of this contract without prior written approval by the University's Contract Administrator. The individuals designated as key personnel for purposes of this contract are those specified in the Contractor's proposal.

5. **SUBCONTRACTING:** Work proposed to be performed under this contract by the Contractor or its employees shall not be subcontracted without prior written approval of the University's Contract Administrator. Acceptance of an offeror's proposal shall include any subcontractor(s) specified therein.

6. **INSPECTION AT CONTRACTOR'S SITE:** The University reserves the right to inspect, at a reasonable time, the equipment/item, plant or other facilities of a prospective contractor prior to contract award, and during the contract term as necessary for the University's determination that such equipment/item, plant or other facilities conform with the specifications/requirements and are adequate and suitable for the proper and effective performance of the contract.

7. **PERFORMANCE AND DEFAULT:** If, through any cause, the Contractor shall fail to fulfill in timely and proper manner the obligations under this agreement, the University shall thereupon have the right to terminate this contract by giving written notice to the Contractor and specifying the effective date thereof. In that event, all finished or unfinished deliverable items under this contract prepared by the Contractor shall, at the option of the University, become its property, and the Contractor shall be entitled to receive just and equitable compensation for any satisfactory work completed on such materials.

   Notwithstanding, the Contractor shall not be relieved of liability to the University for damages sustained by the University by virtue of any breach of this agreement, and the University may withhold any payment due the Contractor for the purpose of setoff until such time as the exact amount of damages due the University from such breach can be determined.

   In case of default by the Contractor, the University may procure the services from other sources and hold the Contractor responsible for any excess cost occasioned thereby. The University reserves the right to require a performance bond or other acceptable alternative guarantees from a successful offeror without expense to the University.

   In addition, in the event of default by the Contractor under this contract, the State may immediately cease doing business with the Contractor, immediately terminate for cause all

existing contracts the State has with the Contractor, and de-bar the Contractor from doing future business with the State.

Upon the Contractor filing a petition for bankruptcy or the entering of a judgment of bankruptcy by or against the Contractor, the University may immediately terminate, for cause, this contract and all other existing contracts the Contractor has with the University.

8. **GOVERNMENTAL RESTRICTIONS:** In the event any Governmental restrictions are imposed which necessitate alteration of the material, quality, workmanship or performance of the items offered prior to their delivery, it shall be the responsibility of the contractor to notify, in writing, the issuing purchasing office at once, indicating the specific regulation which required such alterations. The University reserves the right to accept any such alterations, including any price adjustments occasioned thereby, or to cancel the contract.

9. **FORCE MAJEURE:** Neither party shall be deemed to be in default of its obligations hereunder if and so long as it is prevented from performing such obligations by an act of war, hostile foreign action, nuclear explosion, earthquake, hurricane, tornado, or other catastrophic natural event or act of God.

10. **TERMINATION:** The University may terminate this agreement at any time by providing written notice to the contractor at least thirty (30) days before the effective date of the termination. In that event, all finished or unfinished deliverable items prepared by the Contractor under this contract shall, at the option of the University, become its property. If the contract is terminated by the University as provided herein, the Contractor shall be paid for services satisfactorily completed, less payment or compensation previously made. All promises, requirements, terms, conditions, provisions, representations, guarantees, and warranties contained herein shall survive the contract expiration or termination date unless specifically provided otherwise herein, or unless superseded by applicable Federal or State statutes of limitations. The Contractor may terminate at the beginning of any contract year, only by notification provided in writing to the University a minimum of four (4) months prior to the applicable contract year expiration.

11. **AVAILABILITY OF FUNDS:** Any and all payments to the Contractor are dependent upon and subject to the availability of funds to the University for the purpose set forth in this agreement. The university pays Net 30 days from receipt of a proper invoice.

12. **CONFIDENTIALITY:** Any information, data, instruments, documents, studies or reports given to or prepared or assembled by the Contractor under this agreement shall be kept as confidential and not divulged or made available to any individual or organization without the prior written approval of the University.

13. **CARE OF PROPERTY:** The Contractor agrees that it shall be responsible for the proper custody and care of any property furnished for use in connection with the performance of this contract or purchased by it for this contract and will reimburse the State for loss of damage of such property.

14. **COPYRIGHT:** No deliverable items produced in whole or in part under this agreement shall be the subject of an application for copyright by or on behalf of the Contractor. In addition, all inventions and the copyright in and to any copyrightable work, including, but not limited to, copy, art, negatives, photographs, designs, text, software, or documentation created as part of the Contractor's performance of this project shall vest in the University, and the Contractor agrees to assign all rights therein to the University. Contractor further agrees to provide University with any and all reasonable assistance which University may require to file patent applications, to obtain copyright registrations, or to perfect its title in any such inventions or works, including the execution of any documents submitted by the University.

15. **ASSIGNMENT:** No assignment of the Contractor's obligations or the Contractor's right to receive payment hereunder shall be permitted. However, upon written request approved by the issuing purchasing authority, the University may:

    1. Forward the contractor's payment check(s) directly to any person or entity designated by the Contractor, or
    2. Include any person or entity designated by Contractor as a joint payee on the Contractor's payment check(s).

    In no event shall such approval and action obligate the University to anyone other than the Contractor and the Contractor shall remain responsible for fulfillment of all contract obligations.

16. **COMPLIANCE WITH LAWS:** The Contractor shall comply with all laws, ordinances, codes, rules, regulations, and licensing requirements that are applicable to the conduct of its business, including those of federal, state, and local agencies having jurisdiction and/or authority.

17. **AFFIRMATIVE ACTION:** The Contractor shall take affirmative action in complying with all Federal and State requirements concerning fair employment and employment of people with disabilities, and concerning the treatment of all employees without regard to discrimination by reason of race, color, religion, sex, national origin, or disability.

18. **SAFETY STANDARDS:** All manufactured items and/or fabricated assemblies subject to operation under pressure, operation by connection to an electric source, or operation involving a connection to a manufactured, natural, or LP gas source shall be constructed and approved in a manner acceptable to the appropriate state inspector which customarily requires the label or re-examination listing or identification marking of the appropriate safety standard organization; such as the American Society of Mechanical Engineers for pressure vessels; the Underwriters Laboratories and /or National Electrical Manufacturers' Association for electrically operated assemblies; or the American Gas Association for gas operated assemblies, where such approvals of listings have been established for the type of device offered and furnished. Further, all items furnished shall meet all requirements of the Occupational Safety and Health Act (OSHA), and state and federal requirements relating to clean air and water pollution.

19. **INSURANCE:** During the term of the contract, the contractor at its sole cost and expense shall provide commercial insurance of such type and with such terms and limits as may be reasonably associated with the contract. As a minimum, the contractor shall provide and maintain the following coverage and limits:

    1. **Worker's Compensation** - The contractor shall provide and maintain Workers Compensation Insurance, as required by the laws of North Carolina, as well as employer's liability coverage with minimum limits of $500,000.00, covering all of Contractor's employees who are engaged in any work under the contract. If any work is subcontracted, the contractor shall require the subcontractor to provide the same coverage for any of its employees engaged in any work under the contract.
    2. **Commercial General Liability** - General Liability Coverage on a Comprehensive Broad Form on an occurrence basis in the minimum amount of $1,000,000.00 Combined Single Limit. (Defense cost shall be in excess of the limit of liability).
    3. **Automobile** - Automobile Liability Insurance, to include liability coverage, covering all owned, hired and non-owned vehicles, used in connection with the contract. The minimum combined single limit shall be $1,000,000.00 bodily injury and property damage; $1,000,000.00 uninsured/underinsured motorist; and $1,000.00 medical payment.

Providing and maintaining adequate insurance coverage is a material obligation of the contractor and is of the essence of this contract. All such insurance shall meet all laws of the State of North Carolina. Such insurance coverage shall be obtained from companies that are authorized to provide such coverage and that are authorized by the Commissioner of Insurance to do business in North Carolina. The contractor shall at all times comply with the terms of such insurance policies, and all requirements of the insurer under any such insurance policies, except as they may conflict with existing North Carolina laws or this contract. The limits of coverage under each insurance policy maintained by the contractor shall not be interpreted as limiting the contractor's liability and obligations under the contract.

20. **ADVERTISING:** Contractor shall not use the existence of this contract or the name of the State of North Carolina or North Carolina State University as part of any advertising without prior written approval from the University.

21. **ENTIRE AGREEMENT:** This contract and any documents incorporated specifically by reference represent the entire agreement between the parties and supersede all prior oral or written statements or agreements. This Request for Proposal, any addenda thereto, and the offeror's response are incorporated herein by reference as though set forth verbatim.

    All promises, requirements, terms, conditions, provisions, representations, guarantees, and warranties contained herein shall survive the contract expiration or termination date unless specifically provided otherwise herein, or unless superseded by applicable Federal or State statutes of limitation.

22. **AMENDMENTS:** This contract may be amended only by written amendment duly executed by authorized representatives of both the University and the Contractor.

23. **TAXES:** N.C.G.S. §143-59.1 bars the Secretary of Administration from entering into contracts with Contractors if it or its affiliates meet one of the conditions of N.C.G. S. §105-164.8(b) and refuse to collect use tax on sales of tangible personal property to purchasers in North Carolina. Conditions under G. S. 105-164.8(b) include: (1) Maintenance of a retail establishment or office, (2) Presence of representatives in the State that solicit sales or transact business on behalf of the Contractor and (3) Systematic exploitation of the market by media-assisted, media-facilitated, or media-solicited means. By execution of the bid document the Contractor certifies that it and all of its affiliates, (if it has affiliates), collect(s) the appropriate taxes.

24. **GENERAL INDEMNITY:** The Contractor shall hold and save the University, its officers, agents, and employees, harmless from liability of any kind, including all claims and losses accruing or resulting to any other person, firm, or corporation furnishing or supplying work, services, materials, or supplies in connection with the performance of this contract, and from any and all claims and losses accruing or resulting to any person, firm, or corporation that may be injured or damaged by the Contractor in the performance of this contract and that are attributable to the negligence or intentionally tortious acts of the Contractor provided that the Contractor is notified in writing within 30 days that the State has knowledge of such claims. The Contractor represents and warrants that it shall make no claim of any kind or nature against the University's agents who are involved in the delivery or processing of Contractor goods to the University. The representation and warranty in the preceding sentence shall survive the termination or expiration of this contract.

25. **OUTSOURCING:** Any Contractor or subcontractor providing call or contact center services to the University or State of North Carolina shall disclose to inbound callers the location from which the call or contact center services are being provided.

If, after award of a contract, the Contractor wishes to outsource any portion of the work to a location outside the United States, prior written approval must be obtained from the University agent responsible for the contract.

Contractor must give notice to the University of any relocation of the Contractor, employees of the Contractor, subcontractors of the Contractor, or other persons performing services under a state contract outside of the United States.

26. **PRICING:** All prices offered herein shall be firm against any increases. Requests by the Contractor for a cost increase relevant to any contract extension shall be submitted in writing one hundred and eighty (180) days prior to each contract renewal. The University reserves the option of accepting a Contractor's proposed cost increase or canceling the service and seeking proposals from other Contractors. Requests for cost increases will be indexed to the same percent as any change in the Consumer Price Index/All Urban Consumers for the previous twelve month period of the request. Invoices are paid Net 30 days from receipt of an accurate invoice.

27. **DEBARMENT CERTIFICATION:** Offeror certifies to the best of its knowledge and belief, that it nor any of its principals a) are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contract by any Federal agency; b) have not within a three year period preceding this award been convicted of or had a civil judgment rendered against them for: commission of a fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state or local) contract or subcontract; violation of Federal or state antitrust statutes relating to this submission of offers; or commission of embezzlement, theft, forgery, bribery, falsifications or destruction of records, making false statements, or receiving stolen property; and c) are not presently indicted for, or otherwise criminally or civilly charged by a government entity with, commission of any of these offenses enumerated herein. The offer certifies that they have not, within a three year period preceding this offer, had one or more contracts terminated for default by any federal agency.

    “Principles” for the purpose of this certification, means officers; directors; owners; partners; and persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segments, and similar positions.)

    This certification concerns a matter within the jurisdiction of an agency of the United States and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution. Certification of this provision is a material representation of fact upon which reliance was placed when making an award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the University, the University may terminate this agreement for default.

    Offeror hereby certifies these conditions and does so by signing the execution page of this RFP document.

28. **PRIVACY:**

    1. Personal Identifiers: If University provides the Contractor with personal identifiers as listed in N.C.G.S. §132-1.10 and in N.C.G.S. §14-133.20(b) or any other legally confidential information, Contractor hereby certifies that collection of this information from University is necessary for the performance of Contractor’s duties and responsibilities on behalf of University under this Contract. Contractor further certifies that it shall maintain the

confidential and exempt status of any social security number information, as required by N.C.G.S. §132-1.10(c) (1), and that it shall not re-disclose personally identifiable information as directed by State and Federal laws. Failure to abide by legally applicable security measures and disclosure restrictions may result in the interruption, suspension and/or termination of the relationship with Contractor for a period of at least five (5) years from date of violation. If Contractor experiences a security breach, as defined in N.C.G.S. §75.61(14), relating to this information, in addition to the Contractor's responsibilities under the NC Identity Theft Protection Act, Contractor shall immediately notify University with the information listed in N.C.G.S. §75-65(d)(1-4) and shall fully cooperate with University. Contractor shall indemnify University for any breach of confidentiality or failure of its responsibilities to protect confidential information. Specifically, these costs may include, but are not limited to, the cost of notification of affected persons as a result of its unauthorized release of University data provided to Contractor pursuant to the Contract.

2. Education Records: If the University provides the Contractor with "personally identifiable information" from a student's education record as defined by FERPA, 34 CFR §99.3, Contractor hereby certifies that collection of this information from University is necessary for the performance of Contractor's duties and responsibilities on behalf of University under this Contract. In this instance, University considers Contractor a school official with a legitimate interest under FERPA. Contractor further certifies that it shall maintain the confidential status of education records in their custody, and that it shall not re-disclose personally identifiable information as directed by FERPA. Failure to abide by legally applicable security measures and disclosure restrictions may result in the interruption, suspension and/or termination of the relationship with Contractor for a period of at least five (5) years from date of violation. If Contractor experiences a security breach relating to this information or if Contractor re-discloses the information, Contractor shall immediately notify University. Contractor shall indemnify University for any breach of confidentiality or failure of its responsibilities to protect the personally identifiable information. Specifically, these costs may include, but are not limited to, the cost of notification of affected persons as a result of its unauthorized release of University data provided to Contractor pursuant to the Contract.

29. **AUDITS:** The State or University auditor, or the Joint Commission on Governmental Operations and legislative employees whose primary responsibility is to provide professional or administrative services to the Commission, may audit the records of Contractor during and after the term of this Agreement to verify accounts and data affecting fees or performance in accordance with North Carolina General Statutes §143-49(9) and §147-64.7 and Session Law 2023-134.

30. **PRESERVATION OF RECORDS:** If the University provides any data to Contractor pursuant to this Agreement then Contractor shall preserve and maintain the data for a period of three (3) years or as indicated in a litigation hold letter issued by University, to fulfill the University's obligations under the North Carolina Public Records Act and under the Federal and North Carolina Rules of Civil Procedure. Contractor shall immediately preserve and maintain data (and any generated email correspondence) upon the University's request or upon notice of litigation or audit and further Contractor shall make available all Data University may specify with the time limits required.

31. **CONTRACTOR EMPLOYEE BACKGROUND CHECKS:** The Contractor shall, at no additional cost to the University, secure appropriate background checks on all employees, independent contractors, or subcontractor employees to be assigned to any resulting contract. These background checks shall include, at a minimum, the following checks with consideration for current, past, alias and maiden names:

    - Nationwide Federal Criminal search
    - National Sex Offender Registry search

- North Carolina Statewide Criminal search
- Criminal searches in all counties of residence outside the state of North Carolina in the past seven (7) years, except in cases when the individual has resided in the New York boroughs of Kings, Queens, New York, Nassau, Richmond, or Bronx, in which case a New York Statewide Criminal Search is required
- Skip Trace, Residency history, or other Social Security Number-based search (to ensure validity and correct matching)

The Contractor shall align its hiring decisions to support the University's ongoing effort to maintain a safe, drug-free environment for students, faculty, staff and visitors.

These background checks shall be maintained by the Contractor and are subject to audit by appropriate University or state officials at any time during and for five (5) years after the contract end date. The University may withhold consent of any of Contractor's personnel to be placed on a University assignment at its sole discretion. The Contractor shall immediately (same day as notification) remove any employee or representative from University property if deemed by the University to be unfit for any reason.

Appendix A EQUIPMENT/SYSTEM INVENTORY

The following sections listed the equipment, boilers, chillers, etc., that are either in use or planned installations for the Central Utility Plants and the Distributed Systems.

A.1 CENTRAL UTILITY PLANT SYSTEMS

A.1.1 Existing Central Chiller Plant Equipment Description

A.1.1.1 Location: **Cates Central Utility Plant (Cates)**

Chiller Designation	**CCH1**	**CCH2**
Chiller Manufacturer	TRANE	TRANE
Chiller Type	Centrifugal DUPLEX	Centrifugal DUPLEX
Design Capacity (tons)	2000	2000
Average Tonnage Used	66%	66%
Run Time (hrs/day)	24	24
Run Time (days/yr)	270	270
CHW Send Temp (deg F)	42	42
CHW Return Temp (deg F)	52	52
Design CHW Flow (GPM)	4800	4800
Avg. CW Recirc. Rate (GPM/ton)	2.4	2.4
CW Inlet Temp (deg F)	85	85
CW Outlet Temp (deg F)	95	95
Design CW Flow (GPM)	6000	6000
Avg. CW Recirc. (GPM/ton)	3	3
2024 CHW makeup (gal)	**34,500**	
2024 CW makeup (gal)	**22,300,000**	
2024 Cooling Tower Water Volume (estimated gal)	**40,000**	

Note(s):

1. CCH1/2 are on a common header to 2, 2000+ ton cooling towers.

A.1.1.2 Location: Yarbrough Central Utility Plant (Yarbrough)

Chiller Designation	**YCH1**	**YCH2***	**YCH3**	**YCH4**	**YCH5**	**YCH6**
Chiller Manufacturer	YORK	TRANE	TRANE	TRANE	TRANE	TRANE
Chiller Type	Steam Driven Turbine	Centrifugal DUPLEX	Centrifugal DUPLEX	Centrifugal DUPLEX	Centrifugal DUPLEX	Centrifugal DUPLEX
Design Capacity (tons)	2000	2000	2000	2000	2000	2000
Average Tonnage Used	66%	66%	66%	66%	66%	66%
Run Time (hrs/day)	24	24	24	24	24	24
Run Time (days/yr)	270	270	270	270	270	270
CHW Send Temp (deg F)	42	42	42	42	42	42
CHW Return Temp (deg F)	52	52	52	52	52	52
Design CHW Flow (GPM)	4800	4800	4800	4800	4800	4800
Avg. CW Recirc. Rate (GPM/ton)	2.4	2.4	2.4	2.4	2.4	2.4
CW Inlet Temp (deg F)	85	85	85	85	85	85
CW Outlet Temp (deg F)	95	95	95	95	95	95
Design CW Flow (GPM)	6000	6000	6000	6000	6000	6000
Avg. CW Recirc. (GPM/ton)	3	3	3	3	3	3
2024 CHW makeup (gal)	**340,000**					
2024 CW makeup (gal)	**33,300,000**					
2024 Cooling Tower Water Volume (estimated gal)	**80,000**					

Note(s):

1. YCH1/2/3/4/5/6 are on a common header to 6, 2000+ ton cooling towers.
2. YCH1 is a Steam Driven Turbine chiller.
3. YCH2 is expected to be installed and running by Q2 of 2026

A.1.1.3 Location: Centennial Campus Central Utility Plant (CCUP)

Chiller Designation	**CCCH1**	**CCCH2**	**CCCH3**	**CCCH4**	**CCCH5**	**CCCH6**
Chiller Manufacturer	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE
Chiller Type	Centrifugal SIMPLEX	Centrifugal DUPLEX	Centrifugal DUPLEX	Centrifugal DUPLEX	Centrifugal DUPLEX	Centrifugal DUPLEX
Design Capacity (tons)	1000	2000	2000	2000	2000	2000
Average Tonnage Used	66%	66%	66%	66%	66%	66%
Run Time (hrs/day)	24	24	24	24	24	24
Run Time (days/yr)	270	270	270	270	270	270
CHW Send Temp (deg F)	42	42	42	42	42	42
CHW Return Temp (deg F)	52	52	52	52	52	52
Design CHW Flow (GPM)	2000	4000	4000	4000	4000	4000
Avg. CW Recirc. Rate (GPM/ton)	2	2	2	2	2	2
CW Inlet Temp (deg F)	85	85	85	85	85	85
CW Outlet Temp (deg F)	95	95	95	95	95	95
Design CW Flow (GPM)	3000	6000	6000	6000	6000	6000
Avg. CW Recirc. (GPM/ton)	3	3	3	3	3	3
2024 CHW makeup (gal)	**35,000**					
2024 CW makeup (gal)	**500,000**					
2024 CW REUSE makeup (gal)	**60,000,000**					
2024 Cooling Tower Water Volume (estimated gal)	**70,000**					

Note(s):

1. CCCH1/2/3/4/5/6 are on a common header to 4, 3000+ ton cooling towers.
2. The cooling towers are banked in groups of 2 towers each with a sump for each bank.
3. CCUP has a TES tank that is 3.2 million gallons and is operated daily.

A.1.1.4 Location: Centennial Biomedical Campus Central Utility Plant (CBC)

Chiller Designation	**CBCH4**	**CBCH5**	**CBCH6**
Chiller Manufacturer	TRANE	TRANE	TRANE
Chiller Type	Centrifugal	Centrifugal DUPLEX	Centrifugal DUPLEX
Design Capacity (tons)	800	2000	2000
Average Tonnage Used	100%	66%	66%
Run Time (hrs/day)	24	24	24
Run Time (days/yr)	270	270	270
CHW Send Temp (deg F)	42	42	42
CHW Return Temp (deg F)	52	52	52
Design CHW Flow (GPM)	1600	4000	4000
Avg. CW Recirc. Rate (GPM/ton)	2	2	2
CW Inlet Temp (deg F)	85	85	85
CW Outlet Temp (deg F)	95	95	95
Design CW Flow (GPM)	2400	6000	6000
Avg. CW Recirc. (GPM/ton)	3	3	3
2024 CHW makeup (gal)	**17,000**		
2024 CW makeup (gal)	**18,000,000**		
2024 Cooling Tower Water Volume (estimated gal)	**25,000**		

Note(s):

1. CBCH4/5/6 are on a common header to 4 banked cooling towers (2 per bank).
2. CBCCH4 will be removed from service and a new 2000T chiller will be installed to support a new project. In the same project, the existing cooling towers will be replaced with a similar style. Estimated project completion in 2027.

A.1.1.5 Location: West Regional Chiller Plant (WRC)

Chiller Designation	**WCH1**	**WCH2**	**WCH3**
Chiller Manufacturer	TRANE	TRANE	TRANE
Chiller Type	Centrifugal SIMPLEX	Centrifugal SIMPLEX	Centrifugal SIMPLEX
Design Capacity (tons)	650	650	650
Average Tonnage Used	66%	66%	66%
Run Time (hrs/day)	24	24	24
Run Time (days/yr)	270	270	270
CHW Send Temp (deg F)	42	42	42
CHW Return Temp (deg F)	52	52	52
Design CHW Flow (GPM)	1300	1300	1300
Avg. CW Recirc. Rate (GPM/ton)	2	2	2
CW Inlet Temp (deg F)	85	85	85
CW Outlet Temp (deg F)	95	95	95
Design CW Flow (GPM)	1950	1950	1950
Avg. CW Recirc. (GPM/ton)	3	3	3
2024 CHW makeup (gal)	**1,000**		
2024 CW makeup (gal)	**5,000,000**		
2024 Cooling Tower Water Volume (estimated gal)	**13,000**		

Note(s):

A.1.2 Existing Central Boiler Plant Equipment Description

A.1.2.1 Location: Cates Central Utility Plant (Cates)

Boiler Designation	**HRSG1**	**HRSG2**
Boiler Manufacturer	RENTECH	RENTECH
Boiler Type	Heat Recovery Steam Generator (water tube)	Heat Recovery Steam Generator (water tube)
Steam Capacity (lbs/hr)	50,000	50,000
Design Pressure (psig)	150	150
Operating Pressure (psig)	150	151
Feedwater Temp To Economizer (deg F)	220F	220F
Feedwater Temp To Boiler (deg F)	310F	310F
Average use per year (months)	12	12
2024 Steam production (lbs)	**525,000,000**	
2024 Makeup water (gal)	**13,500,000**	
2024 Fuel Oil usage (gal)	**61,000**	

Note(s):

A.1.2.2 Location: Yarbrough Central Utility Plant (Yarbrough)

Boiler Designation	**YB2**	**YB3**	**YB4**
Boiler Manufacturer	Erie City	RENTECH	RENTECH
Boiler Type	water tube	water tube	water tube
Steam Capacity (lbs/hr)	100,000	100,000	100,000
Design Pressure (psig)	150	150	150
Operating Pressure (psig)	150	150	150
Feedwater Temp To Economizer (deg F)	220F	220F	220F
Feedwater Temp To Boiler (deg F)	310F	310F	310F
Average use per year (months)	3	3	3
2024 Steam production (lbs)	**96,000,000**		
2024 Makeup water (gal)	**10,000,000**		
2024 Fuel Oil usage (gal)	**132,000**		

A.1.2.3 Location: Centennial Campus Central Utility Plant (CCUP)

Boiler Designation	**HRSG1**	**CCB2**	**CCB3**	**CCB4**
Boiler Manufacturer	Rentech	Cleaver-Brooks	Cleaver-Brooks	Nebraska Boiler
Boiler Type	water tube	fire tube	fire tube	water tube
Steam Capacity (lbs/hr)	60,000	20,700	20,700	80,000
Design Pressure (psig)	150	150	150	150
Operating Pressure (psig)	125	125	125	125
Feedwater Temp To Economizer (deg F)	N/A	N/A	N/A	225
Feedwater Temp To Boiler (deg F)	225	225	225	310
Average use per year (months)	6	6	6	6
2024 Steam production (lbs)	**308,000,000**			
2024 Makeup water (gal)	**7,500,000**			
2024 Fuel Oil usage (gal)	**75,000**			

Note(s):

A.1.2.4 Location: Centennial Biomedical Campus Central Utility Plant (CBC)

Boiler Designation	**CBB1**	**CBB2**	**CBB3**	**CBB4**
Boiler Manufacturer	York-Shipley	Cleaver-Brooks	Cleaver-Brooks	Cleaver-Brooks
Boiler Type	fire tube	fire tube	fire tube	fire tube
Steam Capacity (lbs/hr)	13,800	13,800	13,800	13,800
Design Pressure (psig)	150	150	150	150
Operating Pressure (psig)	80	80	80	80
Feedwater Temp To Boiler (deg F)	228	228	228	228
Average use per year (months)	6	6	6	6
2024 Steam production (lbs)	**92,000,000**			
2024 Makeup water (gal)	**3,500,000**			
2024 Fuel Oil usage (gal)	**13,000**			

Note(s):

A.1.3 Central Plant Bulk Chemical Tank Inventory

Unloading Point	Nalco Product	Description	Tank Size	Serial Number
Cates Boiler Plant	1820.36	Amine	105 gal	171713
	8735.36	O-Alkalinity	110 gal	912151
	22310.36	NexGuard	110 gal	911561
	1720.36	Sulfite	100 gal	910214
	BC1011.36	Sulfite	110 gal	913818
Cates Chiller Plant	3DT231.36	TRASAR	110 gal	913009
	ST70.36	Oxidizing Biocide	110 gal	394055
	7330.36	Non-Oxidizing Biocide	110 gal	912955
Yarborough Boiler Plant	1820.36	Amine	120 gal	974856
	8735.36	O-Alkalinity	100 gal	910333
	22310.36	NexGuard	110 gal	910448
	BC1011.36	Sulfite	110 gal	911385
	1720.36	Sulfite	110 gal	910895
Yarborough Chiller Plant	7330.36	Non-Oxidizing Biocide	110 gal	913865
	3DT231.36	TRASAR	200 gal	97811
	ST70.36	Oxidizing Biocide	110 gal	909830
	8338.36	Nitrite	110 gal	912577
West Regional Plant	3DT231.36	TRASAR	110 gal	911097
	ST70.36	Oxidizing Biocide	110 gal	913078
	7330.36	Non-Oxidizing Biocide	110 gal	912750
CCUP Chiller Plant	1318.36	Oxidizing Biocide	110 gal	913351
	7330.36	Non-Oxidizing Biocide	110 gal	914177
	3DT494.31	TRASAR	400 gal	65588
	H-550.36	Non-Oxidizing Biocide	110 gal	911242
	7468.36	Defoamer	100 gal	910666
	73551.36	Biodetergent	110 gal	911790
	3DT179.36	TRASAR	105 gal	950468
	Bleach	Bleach	550 gal	M10685057
CCUP Boiler Plant	8735.36	O-Alkalinity	110 gal	912042
	8735.36	O-Alkalinity	105 gal	950467
	22310.36	NexGuard	110 gal	910253
	1720.36	Sulfite	100 gal	909961
	1820.36	Amine	105 gal	163065
CBC Boiler	1820.36	Amine	110 gal	180662
	1720.36	Sulfite	110 gal	914078
	22310.36	NexGuard	110 gal	911632
	8735.36	O-Alkalinity	110 gal	911503
	BC1011.36	Sulfite	100 gal	909795
CBC Towers	3DT231.36	TRASAR	110 gal	913010
	ST70.36	Oxidizing Biocide	110 gal	909747
	7330.36	Non-Oxidizing Biocide	110 gal	914603
	8338.36	Nitrite	110 gal	912270

A.1.4 Central Utility Plant Pumps and Controllers

Plant	Manufacturer	Flow Rate (gph)	Pressure (psi)
Yarbrough	Prominent Beta 4	0.37	232
	Prominent Beta 4	0.37	232
	Milton Roy	0.58	250
	Prominent Beta 4	0.37	232
	Prominent Beta 4	0.16	232
	Prominent Beta 5	2.94	102
	Grundfos DOA	4.5	100
	Prominent Beta 5	2.94	102
	Prominent Beta 4	0.37	232
	One (1) Nalco 3D Trasar Tower Controller		
	Two (2) Walchem WBL-400-1N2U Boiler Controllers		

Plant	Manufacturer	Flow Rate (gph)	Pressure (psi)
CCUP	Prominent Beta 4	1.74	102
	Prominent Beta 4	1.74	102
	Gamma L	2.9	101
	Prominent Beta 4	1.74	102
	Gamma L	2.9	101
	Prominent Beta 4	1.74	102
	Grundfos DDS	4.5	100
	Watson Marlow QDOS 20		
	Prominent Beta 4	0.29	232
	Prominent Beta 4	0.95	232
	Prominent Beta 4	0.29	232
	Prominent Beta 4	0.29	232
	LMI Milton Roy	0.58	250
	One (1) Nalco 3D Trasar Tower Controller		
	One (1) Walchem WBL-400-1N2N Boiler Controller		
	Three (3) Walchem WBL-400-1N2U Boiler Controllers		
	One (1) Nalco 3DT FW Controller		
	One (1) Nalco 3DT Chilled Water Controller		

Plant	Manufacturer	Flow Rate (gph)	Pressure (psi)
CBC	Prominent Gamma X (spare)	0.61	232
	Prominent Beta 4 (spare)	0.37	232

	Prominent Beta 4 (spare)	0.95	232
	Prominent Beta 4	0.37	232
	Prominent Beta 4	1.74	102
	Prominent Beta 4	1.74	102
	Prominent Beta 4	0.95	232
	Prominent Gamma L	0.29	253
	Prominent Gamma X	0.61	232
	Prominent Gamma X	0.61	232
	Prominent Gamma X	0.61	232
	Prominent Gamma X	0.61	232
	One (1) Nalco 3D Trasar Tower Controller		
	One (1) Nalco 3D Trasar Boiler/Feedwater Controllers		

Plant	**Manufacturer**	**Flow Rate (gph)**	**Pressure (psi)**
Cates	Prominent Beta 4	0.95	232
	Prominent Beta 4	1.74	102
	LMI Milton Roy	1.6	150
	Prominent Gamma X	0.61	262
	Prominent Gamma X	0.61	262
	Prominent Gamma X	0.6	262
	Prominent Gamma X	0.61	232
	Prominent Beta 4	0.2	145
	One (1) Nalco 3D Trasar Tower Controller		
	One (1) Nalco 3D Trasar Boiler Controllers		

Plant	**Manufacturer**	**Flow Rate (gph)**	**Pressure (psi)**
WRC	Prominent Beta 4	0.29	232
	Prominent Beta 4	0.18	232
	Pulsatron	1.25	100
	One (1) Nalco 3D Trasar Tower Controller		

A.2 DISTRIBUTED SYSTEMS

The following information summarizes the data for the building distributed chillers, steam boilers, hot water boilers, closed loop heating hot water systems, and closed loop chilled water systems.

A.2.1 Distributed Water Cooled Chillers

This section shows the specifications for the distributed cooling systems. The typical operating data for each of the chilled water systems are as follows:

Chiller Type	Centrifugal
Average Percentage of Tonnage Actually used	66%
Running Time (Hours/Days)	24
Average Running Time (Days/Years)	270
Chilled Water Leaving Temperature (°F)	44
Chilled Water Return Temperature (°F)	54
Condensate Water Leaving Temperature (°F)	95
Condensate Water Return Temperature (°F)	85
Cooling Tower Evaporation Rate (gal/ton/hour)	1.5
Condenser Water Volume (gallons/tons)	4.5
Average Chilled Water Recirculation Rate (GPM/ton)	2.5
Average Condenser Water Recirculation Rate (GPM/ton)	3.0
Annual Closed Loop Chilled Water Makeup (% of system volume)	10%

A.2.1 Distributed Water Cooled Chillers (Continued)

Zone	Building Name	Asset	Description	Capacity	Volume
1	KAMPHOEFNER HALL	011AHCCH001	CHILLER	115	1,300
3	BILTMORE HALL	0113HCCH001	CHILLER	400	3,600
3	JORDAN HALL	0058HCCH002	CHILLER	290	2,800
4	MCKIMMON CENTER	0129HCCH002	CHILLER	350	5,500
4	VARSITY RESEARCH BLDG	250AHCCH001	CHILLER	300	-
4	VARSITY RESEARCH BLDG	250AHCCH002	CHILLER	300	3,900
4	TOXICOLOGY BUILDING	0712HCCH001	CHILLER	380	2,300
6	RESEARCH BUILDING I	0730HCCH002	CHILLER	300	3,000
6	RESEARCH BUILDING I	0730HCCH003	CHILLER	250	-
6	RESEARCH BUILDING II	0731HCCH001	CHILLER	130	1,400
6	RESEARCH BUILDING II	0731HCCH002	CHILLER	130	-

NOTES:

(1) The two chillers at Partners 2, two chillers at Research 1, and the two chillers at Research 2 have a common condenser water loop and a single water treatment system.

(2) The two chillers at Varsity Research have separate condenser water loops and separate treatment systems.

A.2.2 Distributed Steam Boilers

Zone	Building Name	Asset #	Type	Treatment	Capacity, MBh
5	Weed Control Lab	0166HBLR002	Steam Boiler	Separate	
5	Method Rd. Unit #3	0173HBLR006	Steam Boiler	Separate	
4	Varsity Research Building	250AHBLR001	Steam Boiler	Single Treatment System	
4	Varsity Research Building	250AHBLR002	Steam Boiler		

Zone	Building Name	Asset #	Type	Treatment	Capacity, MBh
5	Canine Facility CVM???	0340HBLR002		??	
4	Partners II	0710HBLR003	Steam Boiler	Separate	
4	Partners II	0710HBLR004	Steam Boiler	Separate	
4	Toxicology	0712HBLR004	Steam Boiler	Single Treatment System	
4	Toxicology	0712HBLR005	Steam Boiler		
6	Monteith Research Center	720AHBLR001	Steam Boiler	??	
6	Monteith Research Center	720AHBLR002	Steam Boiler	??	
6	Research Building I	730AHBLR004	Steam Boiler	Single Treatment System	
6	Research Building I	730AHBLR005	Steam Boiler	Single Treatment System	
7	Hillsborough	0048HBLR001	Steam Boiler	Separate	

A.2.3 Distributed Hot Water Boilers

Zone	Building Name	Asset	Description	Capacity
1	GREGG MUSEUM	0001HBLR001	Hot Water Boiler	
3	WEST DUNN BLDG	0083HBLR002	Hot Water Boiler	
4	ADMINISTRATIVE SERVICES COMPLEX	0123HBLR002	Hot Water Boiler	
4	SULLIVAN SHOPS BLDG III	124AHBLR001	Hot Water Boiler	
4	MOTOR POOL FACILITY	0126HBLR001	Hot Water Boiler	
4	SULLIVAN SHOPS BLDG I	126DHBLR001	Hot Water Boiler	
4	SULLIVAN SHOPS BLDG II	126EHBLR001	Hot Water Boiler	
4	MCKIMMON EXTENSION EDUCATION CENTER	0129HBLR002	Hot Water Boiler	
4	MCKIMMON EXTENSION EDUCATION CENTER	0129HBLR003	Hot Water Boiler	
4	DON E ELLIS BUILDING	0133HBLR001	Hot Water Boiler	
4	ENVIRONMENTAL HEALTH AND SAFETY CENTER	0210HBLR001	Hot Water Boiler	
4	TOXICOLOGY BUILDING	0712HBLR001	Hot Water Boiler	
4	TOXICOLOGY BUILDING	0712HBLR002	Hot Water Boiler	
4	TOXICOLOGY BUILDING	0712HBLR006	Hot Water Boiler	
4	FRIDAY INSTITUTE	792BHBLR001	Hot Water Boiler	
4	FRIDAY INSTITUTE	792BHBLR002	Hot Water Boiler	
5	WENDELL H. MURPHY FOOTBALL CTR	135FHBLR001	Hot Water Boiler	
5	WENDELL H. MURPHY FOOTBALL CTR	135FHBLR002	Hot Water Boiler	
5	PFIESTERIA RESEARCH LAB	0163HBLR001	Hot Water Boiler	
5	DEARSTYNE ISOL UNITS	164BHBLR001	Hot Water Boiler	
5	DEARSTYNE ENTOMOLOGY BLDG	164CHBLR001	Hot Water Boiler	
5	HEADHOUSE UNIT 1 AT METHOD	0171HBLR001	Hot Water Boiler	
5	HEADHOUSE UNIT 1 AT METHOD	0171HBLR002	Hot Water Boiler	
5	HEADHOUSE UNIT 2 AT METHOD	0172HBLR001	Hot Water Boiler	
5	HEADHOUSE UNIT 2 AT METHOD	0172HBLR002	Hot Water Boiler	

Zone	Building Name	Asset	Description	Capacity
5	UNIT 2 F MECHANICAL BLDG AT METHOD	172FHBLR001	Hot Water Boiler	
5	UNIT 2 F MECHANICAL BLDG AT METHOD	172FHBLR002	Hot Water Boiler	
5	HEADHOUSE UNIT 3 AT METHOD	0173HBLR001	Hot Water Boiler	
5	HEADHOUSE UNIT 3 AT METHOD	0173HBLR004	Hot Water Boiler	
5	HEADHOUSE UNIT 4 AT METHOD	0174HBLR002	Hot Water Boiler	
5	TERRY COMPANION VETERINARY MEDICAL CENTER	300CHBLR001	Hot Water Boiler	
5	HORTICULTURE HEADHOUSE	0444HBLR001	Hot Water Boiler	
5	HORTICULTURE HEADHOUSE	0444HBLR002	Hot Water Boiler	
5	2101 BLUE RIDGE RD	465RHBLR001	Hot Water Boiler	
6	RESEARCH BUILDING II	0731HBLR001	Hot Water Boiler	
6	RESEARCH BUILDING II	0731HBLR002	Hot Water Boiler	
6	DOROTHY AND ROY PARK ALUMNI CT	786AHBLR001	Hot Water Boiler	
6	DOROTHY AND ROY PARK ALUMNI CT	786AHBLR002	Hot Water Boiler	
8	CHERRY BUILDING	755DHBLR001	Hot Water Boiler	
8	CHERRY BUILDING	755DHBLR002	Hot Water Boiler	
8	POULTON INNOVATION CENTER	781AHBLR001	Hot Water Boiler	

A.2.4 Distributed Closed Loop Hot Water Systems

Zone	Building	Asset	Description
1	GREGG MUSEUM	0001HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	WINSLOW HALL	0004HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	PRIMROSE HALL	0006HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	PEELE HALL	0008HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	KAMPHOEFNER HALL	011AHHWL001	Chemical Feed System, I.E. Hot Water Loop
1	LEAZAR HALL	0018HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	WINSTON HALL	0023HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	LANG AND COM LABS	0030HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	SAS HALL	032AHHWL001	Chemical Feed System, I.E. Hot Water Loop
1	PARK SHOPS	0033HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	1911 BLDG	0036HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	111 LAMPE DR	0038HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	RIDDICK HALL	0039HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	MANN HALL	0040HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	WITHERS HALL	0043HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	RICKS HALL	0045HHWL001	Chemical Feed System, I.E. Hot Water Loop
1	PATTERSON HALL	0046HHWL001	Chemical Feed System, I.E. Hot Water Loop
2	DH HILL (EAST(	0047HHWL001	Chemical Feed System, I.E. Hot Water Loop
2	DH HILL ERDAHL	047AHHWL001	Chemical Feed System, I.E. Hot Water Loop
2	DH HILL (NORTH)	047BHHWL001	Chemical Feed System, I.E. Hot Water Loop
2	DH HILL (NORTH)	047BHHWL002	Chemical Feed System, I.E. Hot Water Loop
2	DH HILL (SOUTH)	047CHHWL001	Chemical Feed System, I.E. Hot Water Loop

Zone	Building	Asset	Description
2	POLK HALL	0050HHWL001	Chemical Feed System, I.E. Hot Water Loop
2	POLK HALL	0050HHWL003	Chemical Feed System, I.E. Hot Water Loop
2	POLK HALL	0050HHWL004	Chemical Feed System, I.E. Hot Water Loop
2	BROUGHTON HALL	0051HHWL001	Chemical Feed System, I.E. Hot Water Loop
2	BROUGHTON HALL	0051HHWL002	Chemical Feed System, I.E. Hot Water Loop
2	BUREAU OF MINES	0053HHWL001	Chemical Feed System, I.E. Hot Water Loop
2	DABNEY HALL	0054HHWL001	Chemical Feed System, I.E. Hot Water Loop
2	COX HALL	0055HHWL001	Chemical Feed System, I.E. Hot Water Loop
2	WILLIAMS HALL	0062HHWL001	Chemical Feed System, I.E. Hot Water Loop
2	BOSTIAN HALL	067AHHWL001	Chemical Feed System, I.E. Hot Water Loop
2	THOMAS HALL	067BHHWL001	Chemical Feed System, I.E. Hot Water Loop
3	JORDAN HALL	0058HHWL001	Chemical Feed System, I.E. Hot Water Loop
3	JORDAN HALL ADD.	058AHHWL001	Chemical Feed System, I.E. Hot Water Loop
3	STUDENT HEALTH	0063HHWL001	Chemical Feed System, I.E. Hot Water Loop
3	HOLMES HALL	0077HHWL001	Chemical Feed System, I.E. Hot Water Loop
3	WEST DUNN BLDG	0083HHWL001	Chemical Feed System, I.E. Hot Water Loop
3	CARMICHAEL GYM	0101HHWL003	Chemical Feed System, I.E. Hot Water Loop
3	CARMICHAEL GYM	0101HHWL004	Chemical Feed System, I.E. Hot Water Loop
3	CARMICHAEL GYM	0101HHWL005	Chemical Feed System, I.E. Hot Water Loop
3	CARMICHAEL GYM	101CHHWL001	Chemical Feed System, I.E. Hot Water Loop
3	WEISIGER-BROWN	0111HHWL002	Chemical Feed System, I.E. Hot Water Loop
3	WEISIGER-BROWN	0111HHWL003	Chemical Feed System, I.E. Hot Water Loop
3	BILTMORE HALL	0113HHWL001	Chemical Feed System, I.E. Hot Water Loop
3	PULP & PAPER LABS	113BHHWL001	Chemical Feed System, I.E. Hot Water Loop
3	HODGES WOOD PRODUCTS	0114HHWL001	Chemical Feed System, I.E. Hot Water Loop
3	GRINNELLS LAB	0118HHWL001	Chemical Feed System, I.E. Hot Water Loop
3	GRINNELLS LAB	0118HHWL002	Chemical Feed System, I.E. Hot Water Loop
3	SCHAUB FOOD SCIENCE BUILDING	0120HHWL001	Chemical Feed System, I.E. Hot Water Loop
3	BUTLER COM BLDG.	0128HHWL001	Chemical Feed System, I.E. Hot Water Loop
4	ADMINISTRATIVE SERVICES II	0121HHWL001	Chemical Feed System, I.E. Hot Water Loop
4	ADMINISTRATIVE SERVICES ANNEX	0123HHWL001	Chemical Feed System, I.E. Hot Water Loop
4	SULLIVAN SHOPS BLDG III	124AHHWL001	Chemical Feed System, I.E. Hot Water Loop
4	SULLIVAN SHOPS BLDG I	126DHHWL001	Chemical Feed System, I.E. Hot Water Loop
4	SULLIVAN SHOPS BLDG II	126EHHWL001	Chemical Feed System, I.E. Hot Water Loop
4	MCKIMMON CENTER	0129HHWL001	Chemical Feed System, I.E. Hot Water Loop
4	DON E ELLIS BUILDING	0133HHWL001	Chemical Feed System, I.E. Hot Water Loop
4	ENVIRONMENTAL HEALTH AND SAFETY CENTER	0210HHWL001	Chemical Feed System, I.E. Hot Water Loop
4	ADMINISTRATIVE SERVICES III	0215HHWL001	Chemical Feed System, I.E. Hot Water Loop
4	PUBLIC SAFETY CENTER	0238HHWL001	Chemical Feed System, I.E. Hot Water Loop

Zone	Building	Asset	Description
4	VARSITY RESEARCH BULDING	250AHHWL001	Chemical Feed System, I.E. Hot Water Loop
4	PARTNERS II	0710HHWL001	Chemical Feed System, I.E. Hot Water Loop
4	TOXICOLOGY BUILDING	0712HHWL001	Chemical Feed System, I.E. Hot Water Loop
4	PARTNERS III	0713HHWL001	Chemical Feed System, I.E. Hot Water Loop
4	BTEC	762AHHWL001	Chemical Feed System, I.E. Hot Water Loop
4	PLANT SCIENCES BUILDING	0763HHWL001	Chemical Feed System, I.E. Hot Water Loop
4	FRIDAY INSTITUTE	792BHHWL001	Chemical Feed System, I.E. Hot Water Loop
5	PFIESTERIA RESEARCH LAB	0163HHWL001	Chemical Feed System, I.E. Hot Water Loop
5	DEARSTYNE ISOL UNITS	164BHHWL001	Chemical Feed System, I.E. Hot Water Loop
5	DEARSTYNE ENTOMOLOGY BLDG	164CHHWL001	Chemical Feed System, I.E. Hot Water Loop
5	HEADHOUSE UNIT 1 AT METHOD	0171HHWL001	Chemical Feed System, I.E. Hot Water Loop
5	HEADHOUSE UNIT 2 AT METHOD	0172HHWL001	Chemical Feed System, I.E. Hot Water Loop
5	UNIT 2 F MECHANICAL BLDG AT METHOD	172FHHWL001	Chemical Feed System, I.E. Hot Water Loop
5	HEADHOUSE UNIT 3 AT METHOD	0173HHWL001	Chemical Feed System, I.E. Hot Water Loop
5	HEADHOUSE UNIT 4 AT METHOD	0174HHWL001	Chemical Feed System, I.E. Hot Water Loop
5	CVM RESEARCH BUILDING	300AHHWL001	Chemical Feed System, I.E. Hot Water Loop
5	TERRY COMPANION VETERINARY MEDICAL CENTER	300CHHWL001	Chemical Feed System, I.E. Hot Water Loop
5	COLLEGE OF VETERINARY MEDICINE - MAIN BUILDING	0301HHWL001	Chemical Feed System, I.E. Hot Water Loop
5	HORTICULTURE HEADHOUSE	0444HHWL001	Chemical Feed System, I.E. Hot Water Loop
6	TEXTILES COMPLEX	0700HHWL001	Chemical Feed System, I.E. Hot Water Loop
6	TEXTILES COMPLEX	0700HHWL002	Chemical Feed System, I.E. Hot Water Loop
6	LARRY K. MONTEITH ENGINEERING RES CTR	720AHHWL001	Chemical Feed System, I.E. Hot Water Loop
6	CONSTRUCTED FACILITIES LAB	720CHHWL001	Chemical Feed System, I.E. Hot Water Loop
6	RESEARCH BUILDING I	0730HHWL001	Chemical Feed System, I.E. Hot Water Loop
6	RESEARCH BUILDING I	0730HHWL002	Chemical Feed System, I.E. Hot Water Loop
6	RESEARCH BUILDING II	0731HHWL001	Chemical Feed System, I.E. Hot Water Loop
7	SCOTT HALL	0068HHWL001	Chemical Feed System, I.E. Hot Water Loop
7	SCOTT HALL	0068HHWL002	Chemical Feed System, I.E. Hot Water Loop
7	PHYTOTRON	0070HHWL001	Chemical Feed System, I.E. Hot Water Loop
7	BIOLOGICAL RESOURCES FACILITY	0072HHWL001	Chemical Feed System, I.E. Hot Water Loop
7	DAVID CLARK LABS	0075HHWL001	Chemical Feed System, I.E. Hot Water Loop
7	MARYE ANNE FOX	0076HHWL001	Chemical Feed System, I.E. Hot Water Loop
7	NELSON HALL	0078HHWL001	Chemical Feed System, I.E. Hot Water Loop
7	HARRIS HALL	0090HHWL001	Chemical Feed System, I.E. Hot Water Loop
7	PULLEN HALL	090AHHWL001	Chemical Feed System, I.E. Hot Water Loop

Zone	Building	Asset	Description
7	REYNOLDS COLISEUM	0100HHWL001	Chemical Feed System, I.E. Hot Water Loop
7	TALLEY STUDENT UNION	0102HHWL001	Chemical Feed System, I.E. Hot Water Loop
7	FRANK THOMPSON HALL	0105HHWL001	Chemical Feed System, I.E. Hot Water Loop
7	CLARK HALL	0106HHWL001	Chemical Feed System, I.E. Hot Water Loop
8	CHERRY BUILDING (EARLY COLLEGE HIGH SCHOOL)	755DHHWL001	Chemical Feed System, I.E. Hot Water Loop
8	PARTNERS BUILDING I	0775HHWL001	Chemical Feed System, I.E. Hot Water Loop
8	WOLF RIDGE TOWER HALL	780AHHWL001	Chemical Feed System, I.E. Hot Water Loop
8	POULTON INNOVATION CENTER	781AHHWL001	Chemical Feed System, I.E. Hot Water Loop
8	ENGINEERING BUILDING I (EB1)	782AHHWL001	Chemical Feed System, I.E. Hot Water Loop
8	ENGINEERING BUILDING II (EB2)	782BHHWL001	Chemical Feed System, I.E. Hot Water Loop
8	ENGINEERING BUILDING III (EB3)	782CHHWL001	Chemical Feed System, I.E. Hot Water Loop
8	FITTS-WOOLARD HALL	782EHHWL001	Chemical Feed System, I.E. Hot Water Loop
8	JAMES B HUNT JR CENTENNIAL CAMPUS LIBRARY	783AHHWL001	Chemical Feed System, I.E. Hot Water Loop

A.2.5 Distributed Closed Loop Chilled Water Systems

Zone	Building Name	Asset	Description
1	GREGG MUSEUM	0001HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
1	WINSLOW HALL	0004HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
1	PRIMROSE HALL	0006HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
1	BROOKS HALL	0011HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
1	BURLINGTON NUC LABS	0042HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
2	DH HILL LIBRARY	0047HCWL002	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
2	BROUGHTON HALL	0051HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
2	GARDNER HALL	0067HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
2	GARDNER HALL	0067HCWL002	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
7	PHYTOTRON	0070HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
7	CASE ACADEMIC CENTER	0103HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
3	WEISIGER-BROWN ATH FAC	0111HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
3	D S WEAVER LABS	0117HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
3	D S WEAVER LABS	0117HCWL002	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
3	GRINNELLS LAB	0118HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
3	BUTLER COMM	0128HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP

Zone	Building Name	Asset	Description
4	MCKIMMON CENTER	0129HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
4	DON E ELLIS BUILDING	0133HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
5	UNIT 1 AT METHOD	0171HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
5	UNIT 3 AT METHOD	0173HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
5	UNIT 4 AT METHOD	0174HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
4	PARTNERS BUILDING II	0710HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
4	TOXICOLOGY BUILDING	0712HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
4	PARTNERS BUILDING III	0713HCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
6	RESEARCH BUILDING I	0730HCWL002	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
6	RESEARCH BUILDING II	0731HCWL002	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
1	KAMPHOEFNER HALL	011AHCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
4	SULLIVAN SHOPS BLDG I	126DHCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
4	SULLIVAN SHOPS BLDG II	126EHCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
5	DEARSTYNE ISOL UNITS	164BHCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
5	DEARSTYNE ENTOMOLOGY	164CHCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
4	VARSITY RESEARCH BLDG	250AHCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
8	CHERRY BUILDING	755DHCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
8	ENGINEERING BUILDING I	782AHCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
8	ENGINEERING BUILDING II	782BHCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
8	ENGINEERING BUILDING III	782CHCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
8	JAMES B HUNT LIBRARY	783AHCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
8	JAMES B HUNT LIBRARY	783AHCWL002	CHEMICAL FEED SYSTEM, I.E. CHW LOOP
4	FRIDAY INSTITUTE	792BHCWL001	CHEMICAL FEED SYSTEM, I.E. CHW LOOP

A.3 City of Raleigh Water and Reuse Analysis:

Available from the City of Raleigh at: www.raleighnc.gov/home/content/Departments/Articles/PublicUtilities.html

Appendix B

Example Quality Control Program

Water Treatment Contract Requirements

				2018 1st Qtr	
Administration					
3.1.10	every other week service visits			100%	
3.2.10	wkly	Service Report		100%	
3.1.19	qrtly	Training Reports		No Training	
3.1.27	annual	Business Reviews		Complete in 2018	
4.8	qrtly	Business Reviews		100%	
Testing/Inspections					
3.1.17	annual	Boiler Inspections	digital photos, report	No Q1 inspections	
3.1.17	annual	Chiller Inspections	digital photos, report	94%	
Chemical Analysis					
3.2.10i	quarterly	Boiler Water Iron Testing	feedwater, condensate	100%	
3.2.9	120 days	Corrosion Coupon Reports		0%	Pull on May 1

Quarterly Review of Contract Matrix April, 2018

Green all items completed 95% or better, we target 95% compliance in boiler water treatment applications We target 85% in cooling water applications

Yellow, items that require development

Red, Items that require improvement