SCOPE OF WORK
Waterborne Pathogen Control System and Building Management System
For the VAMC, Canandaigua, NY

1.1 DESCRIPTION OF SERVICES

The Canandaigua VA Medical Center requires a waterborne pathogen control system to reduce the risk of Legionellae in its domestic hot water distribution system. The copper/silver electronic ionization process has proven to be an effective method of controlling Legionella if maintained in accordance with the ASHRAE standard 12-2000. This standard states that copper ion levels must be maintained between levels of 0.2-0.8mg/L and silver ion levels between 0.02-0.08 mg/L. Temperature and pH monitoring are also required in the domestic hot water supply and recirculation system. This request is for buildings 3,8 and 9 at the Canandaigua VA Medical Center to have copper/silver ionizers installed and for temperature and pH sensors installed on buildings 3,7,8 and 9 to monitor temperature and pH deficiencies. Contractor must schedule interruptions of hot and cold domestic water systems to minimize disruptions to patient care activities. Typically this will occur between the hours of 10PM and 5AM Monday through Friday. Contractor will also submit an Infection Control Risk Assessment for approval prior to scheduling work. (Attached) Descriptions of work are stated according to building in the following sections. ALL WORK SHALL BE COMPLETED ACCORDING SCOPE OF WORK, SPECIFICATIONS AND DRAWINGS.

2.1 BUILDING REQUIREMENTS –BUILDING 3

The domestic hot water distribution system serves three floors (approximately 71,000 square feet), including offices, and 35 patient beds. A temperature sensor is required to be installed after the instantaneous hot water supply and a temperature/pH sensor in the recirculation line of the domestic hot water system to monitor deficiencies in temperature and pH. The supply line temperature sensor will be installed directly after the instantaneous water heater. The recirculation line temperature/pH sensor will be installed at the end of the circulation loop, prior to cycling through the water heater.(both sensors will be installed in room 2 of building 3) All sensors must be acclimated into the existing building management system and monitored from control head (located in bldg. 2, room 23). Installation will be provided by contractor to include electrical, data, software, plumbing, supervision and materials.

2.2 IONIZER/SENSOR REQUIREMENTS – BUILDING 3

Provide installation of electric copper/silver ionization generator. This includes the computer controller, ionization chamber flow cell, remote monitoring system, and any associated equipment. System support and monitoring must be provided for one year after government acceptance. Additional annual support and monitoring will be negotiated as required. Installation will be provided by contractor to include electrical, data, software, plumbing, supervision and materials.

A. Provide parts and installation of all required sensors (1 temperature sensor in hot water supply line and 1 temperature/pH sensor in recirculation line to monitor temperatures and pH levels. All sensors will be monitored at building management system. (BMS)

B. Software- Create on BMS a graphics page and combine the above temperature sensors with existing hot water temperatures sensors, already residing on the BMS, that shows all the hot water heaters and recirculation lines and associated temperatures on one page to include all associated buildings. (New sensors and sensors already on the current system.)

C. Software – Create an alarm group with adjustable set points that will alarm and come to the front screen no matter what page viewing at the time or visible at log on. (option – to have alarm also sent to operator)

D. Send pertinent values from vendors control module to BMS (ex. copper levels, voltages et) for VA use or back net to vendor for analysis.

E. Identify power panel by name and location. Power supplies to these systems will run from emergency power supplies.

3.1 BUILDING REQUIREMENTS – BUILDING 7

The hot water distribution system serves three floors (approximately 65,000 square feet), including Voluntary service, human resources, a credit union, offices, and 2 floors of geriatric extended care units. A temperature/pH sensor is required to be installed in the recirculation line of the domestic hot water system to monitor deficiencies in temperature regulation and pH levels. The recirculation sensor will be installed at the end of the circulation loop, prior to cycling through the water heater. (sensor will be located in room 13, building 7 basement.) All sensors must be acclimated into the existing building management system and monitored from control head (located in bldg. 2, room 23). Installation will be provided by contractor to include electrical, data, software, plumbing, supervision and materials.

3.2 IONIZER/SENSOR REQUIREMENTS – BUILDING 7

This building already contains a copper/silver ionizer.

A. Provide parts and installation of required temperature/pH sensor in recirculation line to monitor temperatures and pH levels. Sensor will be monitored at building management system. (BMS)

B. Software- Create on BMS a graphics page and combine the above temperature and pH sensors with existing hot water temperatures sensors, already residing on the BMS, that shows all of the hot water heaters and recirculation lines and associated temperatures and pH levels on one page to include all associated buildings. (New sensors and sensors already on the current system.)

C. Software – Create an alarm group with adjustable set points that will alarm and come to the front screen no matter what page viewing at the time or visible at log on. (option – to have alarm also sent to operator)

D. Send pertinent values from vendors control module to BMS (ex. copper levels, voltages etc.) for VA use or back net to vendor for analysis.

E. Identify power panel by name and location. Power supplies to these systems will run from emergency power supplies.

4.1 BUILDING REQUIREMENTS – BUILDING 8

The hot water distribution system serves three floors (approximately 64,000 square feet), including Audiology Clinic, offices, an Adult Day Care Program and a 35-bed Dementia Unit. A temperature/pH sensor is required to be installed in the recirculation line of the domestic hot water system to monitor deficiencies in temperature regulation and pH levels. The recirculation temperature/pH sensor will be installed at the end of the circulation loop, prior to cycling through the water heater. (Sensor to be located in room 11 of building 8 basement.) All sensors must be

acclimated into the existing building management system and monitored from control head (located in bldg. 2, room 23). Installation will be provided by contractor to include electrical, data, software, plumbing, supervision and materials.

4.2 IONIZER/SENSOR REQUIREMENTS – BUILDING 8
Provide installation of electric copper/silver ionization generator. This includes the computer controller, ionization chamber flow cell, remote monitoring system, and any associated equipment. System support and monitoring must be provided for a period of 1 year after acceptance from the VA. Additional annual support and monitoring will be negotiated as required. Installation will be provided by contractor to include electrical, data, software, plumbing, supervision and materials.

A. Provide parts and installation of a temperature/ pH sensor in hot water recirculation line to monitor temperature and pH levels on the building management system.(BMS)

B. Software- Create on BMS a graphics page and combine the above temperature and pH sensors with existing hot water temperatures sensors, already residing on the BMS, that shows all of the hot water heaters and recirculation lines and associated temperatures and pH levels on one page to include all associated buildings. (New sensors and sensors already on the current system.)

C. Software – Create an alarm group with adjustable set points that will alarm and come to the front screen no matter what page viewing at the time or visible at log on. (option – to have alarm also sent to operator)

D. Send pertinent values from vendors control module to BMS (ex. copper levels, voltages etc.) for VA use or back net to vendor for analysis.

E. Identify power panel by name and location. Power supplies to these systems will run from emergency power supplies.

5.1 BUILDING REQUIREMENTS - BUILDING 9
The hot water distribution system serves three floors (approximately 69,000 square feet), including offices, a library, Occupational Therapy Clinics, a 50-bed Dormitory, and a 30-bed substance Abuse Unit. A temperature/pH sensor is required to be installed in the recirculation line of the domestic hot water system to monitor deficiencies in temperature and pH regulation. This sensor will be installed at the end of the circulation loop, prior to cycling through the water heater. (located in room 12, 9 bldg. basement) Installed sensors must be acclimated into the existing building management system and monitored from control head (located in bldg. 2, room 23A). Installation will be provided by contractor to include electrical, data, software, plumbing, supervision and materials.

5.2 IONIZER/SENSOR REQUIREMENTS – BUILDING 9
Provide installation of electric copper/silver ionization generators. This includes the computer controller, ionization chamber flow cell, remote monitoring system, and any associated equipment. System support and monitoring must be provided for a period of 1 year after acceptance from the VA. Additional annual support and monitoring will be negotiated as required. Installation will be provided by contractor to include electrical, data, software, plumbing, supervision and materials.

A. Provide parts and installation of sensor in hot water recirculation line to monitor temperatures at the building management system. (BMS)

B. Software- Create on BMS a graphics page and combine the above temperature sensors with existing hot water temperatures sensors, already residing on the BMS, that shows all of the hot water heaters and recirculation lines and associated temperatures on one page to include all associated buildings. (New sensors and sensors already on the current system.)

C. Software – Create an alarm group with adjustable set points that will alarm and come to the front screen no matter what page viewing at the time or visible at log on. (option – to have alarm also sent to operator)

D. Send pertinent values from vendors control module to BMS (ex. copper levels, voltages etc.) for VA use or back net to vendor for analysis.

E. Identify power panel by name and location. Power supplies to these systems will run from emergency power supplies.

INFECTION CONTROL (ICRA)
PRE—CONSTRUCTION RISK ASSESSMENT

PROJECT:	Install Waterborne Pathogen Control System	**PROJECT ENGINEER:**	
REVIEWED BY:		**COTR:**	Thomas Hadley
REVIEW DATE:		**PROJECT CSO:**	

ACTIVITY Type of Construction Project Activity (circle your task): defined by the amount of dust generated, duration of activity and amount of shared HVAC systems

TYPE A	TYPE B	TYPE C	TYPE D
Inspection Non-invasive	Small scale Short duration	Moderate/high dust Demolition/removal of building components	Major demolition
• Removal of ceiling tiles for visual inspection only • Painting, but not sanding • Wall covering • Electrical trim work • Minor plumbing • No cutting of walls • No dust generation	• Installation of telephone and computer cabling • Access to chase spaces • Cutting of walls or ceiling where dust migration can be controlled	• Sanding of walls for painting or wall covering • Removal of floor coverings, ceiling tiles, casework • New wall construction • Duct or electrical work above ceilings • Any activity which cannot be completed in a single work shift	• Requires consecutive work shifts • Heavy demolition • Removal of cabling system • New construction

RISK Patient Risk Groups (circle your risk area) If more than one risk group will affected select the higher risk group

LOW RISK	MEDIUM RISK	HIGH RISK	HIGHEST RISK
• Office areas • Classrooms • Meeting rooms • Atrium • Elevators • Warehouse • Laundry • Chapel	• Cardiology • Internal medicine • EKG • GI lab • Nuclear medicine • Physical medicine and rehabilitation (PT, OT, KT) • Radiology • CT scan • MRI • Respiratory therapy • Bronch lab • Urology • Primary Care • Eye clinic • Domiciliary • In-Patient Psychiatry	• Emergency Room • Laboratory • Ward EG • Pharmacy • PACU • NHCU • Surgery clinic • Wound clinic • Dental • ENT clinic	• Ward CG • Ward C1 • SPD • ICU • PCU • OR • Hem/Onc Clinic • Chemotherapy

Infection Control Matrix (circle your class)-Class of Precautions for Construction Projects by Patients Risks

		ACTIVITY			
		TYPE A	TYPE B	TYPE C	TYPE D
RISK	LOW RISK	I	II	II	III/IV
	MEDIUM RISK	I	II	III	IV
	HIGH RISK	I	II	III/IV	IV

	HIGHEST RISK	II	III/IV	III/IV	IV

Class I or II work order tasks may be performed without formal infection control risk assessment.
Class III or IV must have Infection Control Risk Assessment Call your Infection Control Practitioner. Remember to always:

- Use methods to minimize dust from project: water misting work surfaces, sealing air vents, barriers, dust walk-off mats,
- Clean the area (wet mop or HEPA vacuumed) before leaving project and HVAC barriers removed.
- Send a copy of this worksheet must be forwarded to the Infection Control Office

DESCRIPTION OFREQUIRED INFECTION CONTROL PRECAUTIONS BY CLASS:

	DURING PROJECT	UPON COMPLETION OF PROJECT
Class I	1) Execute work by methods to minimize raising dust from construction operations; • Immediately replace a ceiling tile displaced for visual inspection	
Class II	1) Provide active means to prevent airborne dust from dispersing into the atmosphere; 2) Water mist work surfaces to control dust while cutting; 3) Seal unused doors with duct tape 4) Block off and seal air vents; 5) Place dust mat at entrance and exit of work area 6) Remove or isolate HVAC system in areas where work is being performed.	1) Wipe work surfaces with disinfectant 2) Contain construction waste before transport in tightly covered container; 3) Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area 4) Remove isolation HVAC in areas where work is being performed.
Class III	1) Remove and isolate HVAC system in areas where work is being done to prevent contamination of the duct system; 2) Complete critical barriers, i.e. sheetrock, plywood, plastic to seal area from non work area or implement control cube method (cart, with plastic covering and seal connection to worksite with HEPA vacuum or vacuuming prior to exit) before construction begins. 3) Maintain negative air pressure within work site utilizing HEPA equipped filtration units; 4) Contain construction waste before transport in tightly covered containers; 5) Cover transport receptacles or carts. Tape covering unless solid lid is utilized.	1) Do not remove barriers from work area until completed project is inspected by the Safety Department and Infection Control Department and thoroughly cleaned by the Environmental Services Department; 2) Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction; 3) Vacuum work area with filtered vacuums; 4) Wet mop area with disinfectant; 5) Remove isolation of HVAC system in areas where work is being performed.
Class IV	1) Remove or isolate HVAC system in areas where work is being done to prevent contamination of duct system; 2) Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (cart, with plastic covering and seal connection to work site with HEPA vacuum or vacuuming prior to exit) before construction begins. 3) Maintain negative pressure within worksite utilizing HEPA equipped filtration units; 4) Seal holes, pipes, conduits and punctures appropriately; 5) Construct ante-room and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving the worksite or they	1) Remove barrier material carefully to minimize spreading of dirt and debris associated with construction;

	can wear cloth paper coveralls that are removed each time they leave the work site. 6) All personnel entering the work site are required to wear shoe covers. Shoe covers must be changed each time worker exits the work area; 7) Do not remove barriers from work area until completed project is inspected by the Safety Department and Infection Control Department and thoroughly cleaned by the Environmental Services Department.	

Adopted with permission of Virginia Kennedy and Bonnie Barnard, St. Luke's Hospital, Huston TX: www.icanprevent.com

- The purpose of this project is to install copper/ silver ionizers and temperature/pH sensors in the engineering service rooms of buildings 3,7,8 and 9. Work includes disturbances to the domestic hot and cold water systems. Ceiling tile may be moved to run data lines through the hallways of buildings 3,7,8 and 9 to the control head of the building management system in room 23A of building 2, so dust will be moved and generated as a result. Disturbances to the water will occur "off hours" to decrease the impact on patient care.

I have reviewed this project and specified Contractor/facility actions to reduce safety and health issues associated with the project to patients, visitors, and staff.

Infection Prevention Coordinator_____Safety _____