Supplemental Pages for Questions 9a and 9b On the Waiver Template

NOTE:
This waiver submission may include references to proprietary items and brand name products. These references have been retained to provide context for the waiver submission. EPA does not evaluate a waiver based on a proprietary item but reviews the performance-based specifications for the project/products. As such, any references to brand or proprietary items are reviewed on an "or equal" basis by EPA.

Items and pages may have been intentionally redacted or excluded by the EPA. Contact WIFIAWaiver@epa.gov for more information if necessary.

9a. Complete the following table to provide information about the product(s) for which the waiver is being requested. *For each product listed, attach a copy of the relevant technical specifications of the product to this form.*

Product Name	Brief Description (type and size)	Unit Cost of Foreign Product	Unit Cost of Domestic Product	Quantity Needed (complete only if domestic products are available)	Date Product is Needed
DC BFPA	10-Inch Double Check Backflow Prevention Assembly	[redacted]		[redacted]	[redacted]
DC BFPA	12-Inch Double Check Backflow Prevention Assembly	[redacted]		[redacted]	[redacted]

9b. Describe the efforts made to source compliant products. Were AIS-compliant products identified, and if so, are there circumstances around the project that prevent their use (e.g. lead times, performance standards, quantity thresholds)? Include a list of manufacturers or suppliers contacted and responses received as an attachment.

The City of Englewood has conducted extensive market research confirming that no AIS-compliant 10" or 12" AWWA C510 Double Check Backflow Prevention Assemblies (DC BFPAs) are manufactured in the United States.

[redacted]

This requirement is reinforced by Denver Water CPCS Volume 2 (4th Edition), Section 33 14 21, which mandates USC FCCCHR-listed assemblies. USC-listed models exist, but none satisfy AIS. [redacted]

[redacted]

All documentation is included in the attached combined appendix.

SECTION 33 14 21
BACKFLOW PREVENTION ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY
- A. Section includes general information, products, and execution for backflow prevention assemblies.

1.2 REFERENCES
- A. American Society of Mechanical Engineers (ASME):
  1. A112.1.2 – Air Gaps in Plumbing Systems (For Plumbing Fixtures and Water-Connected Receptors)
- B. American Society of Safety Engineers (ASSE):
  1. 1013 – Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers
- C. American Water Works Association (AWWA):
  1. C510 – Double Check Valve Backflow Prevention Assembly (DC)
  2. C511 – Reduced-Pressure Backflow Prevention Assembly (RP)
  3. C550 – Protective Interior Coatings for Valves and Hydrants
  4. C800 – Underground Service Line Valves and Fittings
- D. ASTM International (ASTM):
  1. B 61 – Standard Specification for Steam or Valve Bronze Castings
  2. B 62 – Standard Specification for Composition Bronze or Ounce Metal Castings
  3. B 584 – Standard Specification for Copper Alloy Sand Castings for General Applications
- E. NSF international/American National Standards Institute (NSF/ANSI):
  1. 61 – Drinking Water System Components – Health Effects
  2. 61, Annex G – Weighted Average Lead Evaluation Procedure to a 0.25% Lead Requirement
  3. 372 – Drinking Water System Components – Lead Content

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS
- A. DC BFPA:
  1. University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USC FCCCHR)
- B. RP BFPA:
  1. University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USC FCCCHR)

2.2 MATERIALS
- A. RP BFPAs:
  1. In accordance with ASSE 1013 or AWWA C511.
  2. Operation: Continuous pressure applications.
  3. Pressure loss: 12 psig maximum, through middle 1/3 of flow range.
  4. Body: Bronze for nominal pipe size 2 and smaller; CI with interior lining in accordance with AWWA C550 or that is FDA approved steel with interior lining in accordance with AWWA C550 or that is FDA approved SST for nominal pipe size 2 1/2 and larger.
  5. End connections: Threaded for nominal pipe size 2 and smaller; flanged for nominal pipe size 2 1/2 and larger.
  6. Configuration: Designed for horizontal, straight through vertical inlet, horizontal center section, and vertical outlet vertical flow.
  7. Accessories:
     a. Valves: Ball type with threaded ends on inlet and outlet of nominal pipe size 2 and smaller; OS&Y gate type with flanged ends on inlet and outlet of nominal pipe size 2 1/2 and larger.
     b. Air-gap fitting: ASME A112.1.2, matching BFPA connection.
- B. BFPA Test Kits: Factory calibrated, with gauges, fittings, hoses, and carrying case with test procedure instructions.
- C. Potable Water Applications:
  1. Type V642:
     a. RP BFPAs shall be bronze body and trim.
     b. Maximum pressure drop at rated gpm flow shall not exceed 14 psig.
     c. Each BFPA shall have two gate valves, two independently acting poppet type check valves, one pressure differential relief valve, and four test cocks.
     d. Furnish each BFPA with an air-gap drain funnel.
     e. BFPAs shall have USC approval and be sized as described herein.
  2. Type V680:
     a. RP BFPAs shall be bronze body and trim.
     b. Maximum pressure drop at rated gpm flow shall not exceed 14 psig.
     c. Each BFPA shall have two OS&Y gate valves, two independently acting poppet type check valves, one pressure differential relief valve, and four test cocks.
     d. OS&Y valves shall be installed with NEMA 4 supervisory switches.
     e. Furnish each BFPA with an air-gap drain funnel.
     f. BFPAs shall have UL, FMG, and USC approval and be sized as described herein.
  3. Brass and bronze valve components and accessories that have surfaces in contact with potable water shall be alloys containing less than 15% zinc and 2% aluminum and shall be certified to comply with NSF/ANSI 61, NSF/ANSI 61 Annex G, and NSF/ANSI 372.
  4. Approved alloys: ASTM B 61, ASTM B 62, and ASTM B 584 (Alloy No. B84400).

D. Recycled Water Applications: Brass and bronze goods that have surfaces not in contact with potable water shall be manufactured in accordance with AWWA C800 using alloy UNS No. C83600, commercially known as 85-5-5, in accordance with ASTM B 62.

E. DC BFPA:
   1. Except as modified or supplemented herein, shall be in accordance with AWWA C510.
   2. Rated 175 psi SWP.

F. RP BFPA: Except as modified or supplemented herein, shall be in accordance with AWWA C511.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install BFPAs of the type, size, and capacity as shown on the Drawings. Include valves and test cocks. Install in accordance with the requirements of the plumbing and health department and the AHJ.

B. Do not install BFPAs that have a relief drain in the vault or in other spaces subject toflooding.

C. Do not install bypass piping around BFPAs.

D. Support nominal pipe size 2 1/2 and larger BFPAs, valves, and piping near the floor and on brick or concrete piers.

E. Install a DC BFPA in accordance with the Manufacturer's specifications, in a manhole 2 inch and smaller and in a vault for 2 1/2 inch and larger.

F. Install RP BFPAs in accordance with the Manufacturer's specifications.
   1. Installations within a building to be designed for the mechanical room in accordance with AHJ code.
   2. Installations outside are required at grade in a hot box with electrical service.

3.2 STARTUP

A. The licensee is required to have a certified ABPA or ASSE tester inspect and test an existing or newly installed containment BFPA on dedicated and recycled water service lines, if applicable, upon installation and annually thereafter. Tests shall be conducted at the expense of the licensee. BFPAs shall be repaired or replaced at the licensee's expense when found to be defective. Records of tests, repairs, and replacements shall be kept by the licensee and a copy of the annual test provided to DW.

B. Installed BFPAs that fail to meet the requirements of this Section, but were approved assemblies at the time of installation, may remain if they have been properly maintained and pass annual testing. If the BFPA is replaced, the replacement shall be USC FCCCHR approved.

C. The tester shall:
   1. Complete BFPA testing and submit test reports within 5 days of DW's setting of the meter and turning on of the water service.
   2. Submit a copy of the official ABPA or ASSE certification to DW's Cross Connection Control Group each time the certification is renewed.
   3. Submit a copy of the test kit calibration certification annually.
   4. Have a dedicated recycled water test gauge.
   5. Complete the BFPA test report and submit a copy of the containment BFPA report to DW's Cross Connection Control Group within 5 days. Incomplete or illegible test reports will not be accepted. Test reports shall be supplied on DW's test form which can be obtained online from www.denverwater.org.
   6. Indicate containment or containment by isolation on the test report.
   7. The submission of isolation test results to DW is not required by CDPHE.
   8. Indicate the type of usage (i.e., domestic, irrigation, fire, or recycled) on the test report.
   9. Confirm the DW service address, meter number, BFPA serial number, size, Manufacturer and model, location, and record the values on the test report.
   10. Contact DW's Cross Connection Control Group for discrepancies regarding the meter or BFPA.
   11. Sign, date, and include the time of the test on the report.
   12. Required test reports shall be submitted to DW's Cross Connection Control Group:
      a. Phone: 303-628-5969
         Fax: 303-794-8325
         Email: CrossConnectionControl@denverwater.org
         Mailing Address: Denver Water
         Attn: Cross Connection Control
         6100 W. Quincy Avenue
         Denver, CO 80235

3.3 ADJUSTING

A. Failed Assemblies:
   1. If the BFPA fails and cannot be repaired on the day of its failure, notify the DW Cross Connection Control Group by the certified ABPA or ASSE tester within 24 hours. A copy of the failed test report shall be submitted to the Cross Connection Control Group within 3 days.
   2. The Property Owner is responsible for coordinating the necessary repairs to the BFPA and retesting the unit within 15 days. The Property Owner shall submit a passing test report to the DW Cross Connection Control Group. Failure to comply may result in the suspension of water service.
   3. If the premises has a high hazard BFPA and is deemed a threat to public health (via the private plumbing system), it is at the discretion of DW to suspend the dedicated water service line immediately. The Property Owner shall repair or replace the BFPA before water service will be restored.

B. Exemptions: Single family residential customers are exempt from DW's cross connection control requirements unless the premises is served by a fire suppression system, a dual water supply, or other known hazards. Dual water supply conditions require a Dual Water Supply Agreement to be in effect between DW and the Property Owner.

C. For questions or concerns related to cross connection control, contact DW's Cross Connection Control Group:
   1. Phone: 303-628-5969
   2. Email: CrossConnectionControl@denverwater.org

END OF SECTION