

CONVERSION REIMBURSEMENT STANDARDS

The West Harris County Regional Water Authority (WHCRWA) has provided in its Rate Order that utility district costs of piping to connect from the WHCRWA meter and flow control station to the district's tank(s) and for conversion from chlorine disinfection to chloramine disinfection may be eligible for reimbursement from the WHCRWA. The WHCRWA will not reimburse districts for costs not specifically associated with these two tasks such as replacement of outdated or worn out equipment, maintenance/painting of existing equipment or piping, etc. Without limiting the foregoing, the WHCRWA will not reimburse for the following items:

- Repair or replacement of existing piping;
- Painting of existing piping;
- Repairs or modifications to tanks except for modifications for surface water line and air gap;
- Painting of tanks except for modifications required for surface water line and air gap;
- Replacement of worn out/outdated chlorination equipment;
- Changes of type of chlorination system (e.g., gaseous to sodium hypochlorite);
- Replacement of existing electrical switchgear and controls;
- Repair/maintenance of existing buildings; and
- Repair/maintenance of existing pavement.

The above list is not intended to be an all inclusive list.

Districts' actual and reasonable engineering costs will be eligible for reimbursement in an amount not to exceed 25% of the actual and reasonable construction costs that are eligible and approved by the WHCRWA for reimbursement; provided, however, such engineering costs shall not exceed \$120,000 per district water plant unless the WHCRWA Board, at its discretion, approves an amount greater than \$120,000.

Reimbursement will be contingent upon the district providing proof of Texas Commission on Environmental Quality ("TCEQ") and City of Houston approved plans and specifications and approval by WHCRWA's Engineer.

The district, and not the WHCRWA, shall be responsible for adequately and properly determining the necessary facilities/equipment for the district and installing same. The listing of facilities/equipment included herein is not intended as a recommendation or representation by the WHCRWA (or its Engineer) of what is proper or adequate for any individual district.

WATER SUPPLY PIPING CONNECTION

1. Background

The piping to connect from the WHCRWA's meter and flow control station to each ground storage tank on the district's water plant site will be eligible for reimbursement from the WHCRWA. The connection will include required modifications to the ground storage tank and overflow weirs to provide air gap to meet TCEQ and City of Houston approvals.

2. Piping and Valves – The following may be eligible for reimbursement:

2.1 Ductile iron or steel piping in compliance with City of Houston specifications for water lines.

2.1.1 Internal coating systems in accordance with City of Houston specifications and approved for potable water systems.

2.1.2 External coatings meeting City of Houston specifications and that are comparable to existing coating systems.

2.2 Gate valves or butterfly valves in accordance with City of Houston specifications.

3. Tank Modifications – The following may be eligible for reimbursement:

Modifications for piping connection meeting TCEQ and City of Houston approval for providing air gap and of a material suitable for the tank.

Modifications to overflow weirs, if required, of material comparable to the existing weir and coated with coating system comparable with existing coating system except as may be approved by WHCRWA's Engineer.

DISINFECTION FEED SYSTEM

1. BACKGROUND

Water systems currently using chlorine gas or sodium hypochlorite disinfection for their ground water are required to install and use a chloramine disinfection system prior to attempting any subsequent disinfection action on the water delivered by the Authority to avoid forming undesirable disinfection by-products. The chloramine disinfection system facilities/equipment described below may be eligible for reimbursement. However, except as approved by the WHCRWA's Engineer and Board of Directors, the WHCRWA shall not reimburse more than \$125,000 per district water plant for construction of such chloramine disinfection system facilities/equipment.

As a guide, the following list of key equipment for two types of chloramine disinfection systems is provided. The two types of systems are:

- Chlorine Gas and Liquid Ammonium Sulfate (LAS)
- Sodium Hypochlorite (liquid chlorine or bleach) and LAS

This list is intended as a guide for the key pieces of equipment for which the Authority will consider reimbursement. This list is not intended as an all inclusive list, nor does it take the place of an engineering design for each application. The disinfection system shall be designed in accordance with TCEQ rules/requirements.

The chlorine and ammonia feed systems installed by the district for the water supplied by the WHCRWA are required to be flow paced residual based systems.

The purpose of this reimbursement is intended for costs associated with converting a pre-existing disinfection system to a chloramine disinfection system. Accordingly, unless approved in writing by the WHCRWA, districts scheduled by the WHCRWA to be converted to surface water will not be eligible for a chloramine system reimbursement on any new water plants constructed within 3 years before such time as surface water is generally available from the WHCRWA. All districts constructing water plants should consider this in determining the type of disinfection system to be installed at such new plants. Changes regarding the timing of construction of waterlines may have occurred since the date of the Authority's current Capital Improvement Plan. Accordingly, you are strongly encouraged to, contact the Authority's engineer, Wayne Ahrens of Dannenbaum Engineering Corp. at (713) 527-6378 to, determine your district's date of conversion prior to your district constructing any new water plants.

2. **EQUIPMENT** – The following may be eligible for reimbursement:
 - 2.1. Chlorine Gas and Liquid Ammonium Sulfate (LAS) System
 - 2.1.1. Chlorine Gas Feed System
 - 2.1.1.1. Remote vacuum type gas feeder
 - 2.1.1.2. Rotameter
 - 2.1.1.3. Injector
 - 2.1.1.4. Chlorine Vacuum Regulator
 - 2.1.1.5. Chlorine Automatic Switchover Module
 - 2.1.1.6. Chlorine Weigh Scale
 - 2.1.2. For the Liquid Ammonium Sulfate.
 - 2.1.2.1. Ammoniator vacuum based injection systems (one for each system for primary use and a standby unit) or chemical metering pumps (one for each system for primary use and a standby unit) to deliver liquid ammonium sulfate (LAS).
 - 2.2. Sodium Hypochlorite (liquid chlorine or bleach) and LAS System
 - 2.2.1. A sodium hypochlorite system employing liquid chemicals for both the chlorine and LAS. Reimbursable equipment is listed in the following sections.
 - 2.2.1.1. Hypochlorinator vacuum based injection systems (one for each system for primary use and a standby unit) or chemical metering pumps (one for each system for primary use and a standby unit) to deliver sodium hypochlorite.
 - 2.2.1.2. Ammoniator vacuum based injection systems (one for each system for primary use and a standby unit) or chemical metering pumps (one for each system for primary use and a standby unit) to deliver liquid ammonium sulfate (LAS).
 - 2.3 All piping and valves as necessary for a complete operating system.
 - 2.4 Chemical Storage Tanks (Bulk and Day Tanks)
 - 2.5 Liquid Weigh Scale for weighing chemical drums.
 - 2.6 Chemical Solution Diffusers
 - 2.7 Chemical Building
 - 2.7.1. One insulated, weatherproof fiberglass utility shelter or a concrete block building in compliance with TCEQ regulations and installed on a reinforced concrete foundation. To the extent the building is larger than 10 ft. by 10 ft. (inside dimension), it shall not be

eligible for reimbursement. Larger building up to 10 ft. by 16 ft. may be considered on a case by case basis if day tanks are used.

2.7.2. A new building or room to house chlorine equipment shall not be eligible for reimbursement if the district already has an existing building or room for such purpose.

2.8 Controls

2.8.1 All necessary controls to allow the system to meet TCEQ regulations for disinfection.

2.9 Ammonia and Monochloramine or Ammonia, free and total chlorine analyzers (For Incoming Waterline)

2.10 Ammonia and Monochloramine or Ammonia, free and total chlorine analyzers (For Distribution Waterline)

2.11 Water Softener

2.12 Piping

2.12.1 Single Containment Wall Piping: Schedule 80 PVC piping and fittings inside the chemical storage/feed building

2.12.2 Double Containment Piping: Schedule 80 PVC (Primary)/Schedule 40 PVC (Secondary) double containment piping for all chemical solution yard piping.

2.13 Electrical

2.13.1. If required will include 480 V to 240/120 V transformer and/or lighting panel providing adequate circuits as need for disinfection system.

2.13.2. Conduit and electrical wiring as required.

2.14 Eyewash Shower