Chapter 3
Renewals, Replacements, and Improvements

3.1 General

After reviewing of the Augusta Water Treatment Plant design plans, touring the facility, and discussing the operations with the plant supervisor, we are of the opinion that the water plant is in fair condition for a plant that is 26 years old. We are also of the opinion that the water treatment plant is operated within accepted norms and practices of similar plants located in the Commonwealth of Kentucky.

The WTP went online during 1996 and several components need renewal and/or replacement and, since its original design, the regulations and requirements for treatment facilities have changed and improvements are needed to meet the current standards. The following is a summary of the renewals, replacements, and improvements that need to be considered in the future.

3.2 Groundwater Wells

The groundwater wells are in good operating condition but the electrical disconnects, motor starters, etc. need to be replaced due to the age of the equipment. The following are the specific items associated with the groundwater wells:

- Replace the electrical disconnects, motor starters, and control panels at all four (4) wells.
- Install new telemetry controls for all four (4) wells.
- Paint the electrical service platform for Wells No. 1, 2, and 3.
- Paint the well housing at Wells No. 1, 2, and 3.
- Install bollards or fencing at Wells No. 1, 2, and 3.
- Paint the piping, valves, and casing at Well No. 4.

3.3 Chemical Storage and Feed

The chemical feed systems are functional but it is evident that the operators have made several repairs to the chemical piping over the years and all the metering pumps have been replaced. To bring the chemical feed systems to the current standards, the following items are recommended:

- Replace the existing service water and chemical feed piping with new Sch. 80 PVC and color code all piping.
- Replace the chlorine leak sensor and relay alarms to the plant's SCADA System.

- Paint the chlorine scale and trunnions.
- Replace the metering pumps used for permanganate, liquid alum, polymer, caustic soda and fluoride. Each metering pump to include a pressure relief valve, backpressure valve, and calibration column.
- Refurbish the existing metering pump and store as spare or backup pumps.
- Replace the permanganate mixing tank and mixer. Install the new tank in a spill containment basin.
- Replace the liquid alum bulk tanks and install new day tank
- Replace the polymer blending tank and mixer
- Replace the caustic soda bulk tank and day tank
- Replace the fluoride day tank and scale

3.4 Superpulsator Clarifier

The concrete basins, settling plates, and internal piping are in good operational condition. The following recommendations are made concerning the equipment associated with the Superpulsator:

- Replace the three (3) vacuum pumps and associated valves.
- Vent the pulsation valves and vacuum pumps to the exterior of the building.
- Replace the electrical disconnects for the vacuum pumps and rapid mixer.
- Replace the Superpulsator control panel and motor starter for the vacuum pumps and rapid mixer.
- Replace the blowdown valves and piping.

3.5 Filters

Kenvirons recommends the following improvements be made to the filters:

- New filter control consoles and interface to Main Control Panel
- Replace all media and filter block
- Replace the surface wash arms and piping
- Replace the valve actuators
- Replace the loss-of-head DP cells
- Paint the filter piping

3.6 Clearwell & High Service Pumps

As stated earlier, the current regulations require redundancy at the clearwell and high service pumps so the high service pumps can always deliver water to the distribution system and allow for maintenance.

To correct the deficiency, it is recommended that separate wetwell be constructed with the filter effluent capable being diverted to the basin. New high service pumps will also be installed to pump directly from the wetwell to the distribution system.

3.7 WTP Building

The proposed improvements include items associated with the general renewal of the WTP building. The following are the specific items associated with this renewal and replacement project:

- Paint the interior walls and ceilings
- Install new flooring in the Administration Section

Chapter 4
Opinion of Probable Cost

4.1 Construction Cost Estimate

Rapid Mix	50,000
Pulsator Pumps & Valves	100,000
Clearwell Addition	400,000
Filters	500,000
Internal Piping & Valves	375,000
Instrumentation & Controls	400,000
Chemical Feed Equipment	150,000
High Service Pumps (3)*	175,000
Backwash Pump (2)	150,000
Building Improvements	100,000
Raw Water Wells	TBD
Standby Generator	100,000
TOTAL ESTIMATED CONSTRUCTION COST	**$2,500,000**

4.2 Project Cost Estimate

Construction	2,500,000
Contingency	250,000
Engineering	200,000
Inspection	125,000
Preliminary Engineering Report	25,000
Interest During Construction	100,000
Legal & Administrative & Environmental	50,000
TOTAL	**$3,250,000**