

VIRGINIA DEPARTMENT OF HEALTH
ENGINEERING DESCRIPTION SHEET
WATER

DATE: May 13, 2004

CERTIFIED CLASS: VI

WATERWORKS NAME: Bel Lago
COUNTY/CITY: Franklin County
LOCATION: On State Route 670, approximately 2.5 miles past the intersection with State Route 668.
OWNER: ENIRTEP, Inc.
16430 Booker T. Washington Highway
Moneta, Virginia 24121
(540) 721-4594
OPERATOR: Class VI Certified Operator Required
CONSTRUCTION PERMIT NUMBER: 501004
DATE OF ISSUE: May 13, 2004
TYPE OF TREATMENT: Sequesterant
SOURCE: One Drilled Well
DESIGN CAPACITY: 30 ERCs or 12,000 gpd

DESCRIPTION OF SYSTEM:

The Bel Lago water system is designed to supply potable water to residential homes in the Bel Lago Community. The water supply will consist of one drilled well, sequesterant for iron and manganese, one 10,000-gallon atmospheric type storage tank, two booster pumps, a 2500-gallon hydropneumatic tank and distribution system.

Well No. 1:

This Class IIB well is located on Lot 13 of the Bel Lago Community. This well is a Class IIB well drilled to a total depth of 405 feet. The well is both cased with 6-inch steel casing and pressure grouted to a depth of 54 feet. The well was completed on March 28, 2003. Based on the yield and drawdown test during April 2003, the well has a yield of approximately 15 gpm at a pumped water level of 310 feet. The well casing will extend approximately 1 ft. above a 6 ft. X 6 ft. concrete slab. The well will be provided with a drawdown gauge and pitless adapter with watertight screened well cap. The well appurtenances will include check valve, pressure gauge, gate valve, water meter and screened blowoff. A submersible well pump driven by a 2.0 HP motor will be provided and will be rated 15 gpm at 370 ft. TDH. The water level in the 10,000 gallon atmospheric type storage tank will be controlled by electrodes which will activate the well pump.

Treatment: Treatment will consist of a chemical feed system to feed blended phosphate compound for sequestering iron and manganese. The chemical feed system will consist of a 6 gpd diaphragm metering pump with anti-siphon/backpressure valve and a 30 gallon solution container.

Atmospheric Storage Tank:

A 10,000-gallon nominal volume ground level horizontally mounted steel tank with a diameter of 8 feet and a length of 26-feet 6-inches will be provided. One end of this tank will protrude into the treatment building. A low-level cutoff for the booster pumps will be provided. Appurtenances for the tank will consist of a screened vent, valved drain line, screened overflow, and 24-inch access hatch on top. The inlet line will be extended to the top of the tank and a separate outlet line will be provided. The water level in the storage tank will be controlled by electrodes, which will energize the well pump. The effective volume of this tank will be 8,533 gallons

Booster Pumps:

Two booster pumps will be provided with each pump having a design rated capacity of 162 gpm at 82 feet TDH. The booster pumps will be housed in the 14 foot by 18 foot treatment building, which will be heated, lighted and provided with an access door that can be locked. The booster pumps will operate on cycle of 40/60 psig. Each pump will be driven by a 5-HP motor. Appurtenances for the booster pumps will include gate valve and a compound gauge on the common suction line; individual gate valve on each suction leg to the pump; and a gate valve, pressure gauge and check valve on each individual discharge line. An HOA switch will be provided for each pump.

Hydropneumatic Tanks:

The hydropneumatic tank will have a gross volume of 2500 gallons. One end of this tank protrudes into the treatment building. The hydropneumatic tank will be 5 feet in diameter with a length of 17 feet and will meet the ASME standard for unfired pressure vessels. Appurtenances for this tank will include pressure relief valve, vacuum relief valve, drain line, Schrader valve for air addition, pressure gauge, sight gauge and sample tap.

DESIGN BASIS: 2003 Commonwealth of Virginia *Waterworks Regulations*
An Equivalent Residential Connection (ERC) – 400 gpd

| SOURCE CAPACITY: | <u>Yield Capacity</u> | <u>Pump Capacity</u> | <u>Effective Capacity</u> |
|---|-------------------------|-------------------------|---------------------------|
| Well No. 1 | 15 gpm or 12,000 gpd | 15 gpm or 21,600 gpd | 12,000 gpd |
| Yield Capacity – 15 gpm/0.5 gpm/ERC = 30 ERCs or 12,000 gpd | | | |
| Pump Capacity – 15 gpm x 1,440 min/day = 21,600 gpd | | | |
| Treatment Capacity – 15 gpm or 21,600 gpd | | | |

STORAGE CAPACITY:

| | | |
|---------------------------|---|-----------------------------------|
| Atmospheric Type | - | 8,533 gallons |
| Pressure Type – Effective | - | 833 gallons (1/3 x 2,500 gallons) |
| Total | - | 9,366 gallons |

$$9,366 \text{ gallons} \div 200 \text{ gallons/ERC} = 47 \text{ ERCs}$$

$$47 \text{ ERCs} \times 400 \text{ gpd/ERC} = 18,800 \text{ gpd}$$

BOOSTER PUMP CAPACITY:

$$\text{Combined Capacity} \sim 155 \text{ gpm}$$

$$Q = 11.4 (\text{ERC})^{0.544}$$

$$155 \text{ gpm} = 11.4 (\text{ERC})^{0.544}$$

$$\text{Combined Capacity} = 121 \text{ ERCs or } 48,400 \text{ gpd}$$

Based on the critical value above, once this waterworks has been constructed in accordance with the approved plans with specifications, an operation permit for a design capacity of 30 ERCs or 12,000 GPD will be issued.

JSW/amg