VIRGINIA DEPARTMENT OF HEALTH
ENGINEERING DESCRIPTION SHEET
WATER

DATE: 12 February 1990

WATERWORKS NAME: Lake Forest CERTIFIED CLASS: N/A

COUNTY: Franklin

LOCATION: Located 3/4 mile west of State Route 938, approximately 2.5 miles from the intersection of State Route 938 and State Route 945

OWNER: Shelton Waterworks, Inc.
Mr. Michael E. Shelton
Route 1, Box 436-A
Patrick Springs, Virginia 24133
703-629-8281

OPERATOR: Michael E. Shelton

CE P approved
27 Feb 86

PERMIT NUMBER: 5067356

DATE ISSUED: 17 June 1986 Amended 12 February 1990

Press. Tank Cert.
10 Mar 87
VA 841 60

TYPE OF TREATMENT: None.

SOURCE: One Class II-B well

DESIGN CAPACITY: 31 Equivalent Residential Connections (ERCs) or 12,400 gallons per day (gpd)

DESCRIPTION OF SYSTEM:

This water system consists of a Class II-B well, a 12,000-gallon atmospheric-type water storage tank, two booster pumps, a 2,000-gallon hydropneumatic-type water storage tank, and distribution system.

Well No. 1 - The well is located approximately 85 feet from the intersection of Beech Drive and Ivy Lane of the Lake Forest Development. The well is 305 feet deep, is provided with 6-inch diameter black steel casing, and is grouted to a depth of 63 feet. The well is provided with a submersible pump driven by a 1.5 HP electric motor and rated 18 gpm at 230 feet TDH. The well yielded 15.6 gpm during a 48-hour pump test performed on 4-6 February 1985. Appurtenances include a screened vent, check valve, gate valve, water meter, sample tap, blowoff, drain, and sanitary seal.

Atmospheric-Type Water Storage Tank - The 12,000-gallon steel atmospheric-type storage tank is 10 feet in diameter and 20 feet-6 inches long. Appurtenances include electrodes for the well pump control, screened vent, screened overflow pipe, access manhole with shoebox cover, screened drain, and two concrete saddle supports.

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Booster Pumps - The two pumps have a combined capacity of 231 gpm at 109 feet TDH when operating at 40 psi pressure in the system. Each pump is driven by a 5 HP motor. The pumps are end suction centrifugal type pumps. A single pump will deliver 155 gpm at 97 feet TDH working against a pressure of 35 psi. Appurtenances include automatic alternating controls; a check valve, gate valve, and compound gauge on each pump suction line; and a pressure gauge, gate valve, sample tap, and check valve on each pump discharge line.

Hydropneumatic Tank - This tank is a 2000-gallon black steel pressure vessel and is 66 inches in diameter and 150 inches long. Appurtenances include bypass piping from the atmospheric-type storage tank to system, booster pump controls, access manhole, screened drain, pressure gauge, water sight glass, air blowoff, pressure and vacuum relief valves, and air compressor. The pressure switch operates on a 35/45 psi cycle.

Distribution - This system consists of approximately 1600 linear feet of 4-inch diameter PVC water main and approximately 155 linear feet of 2½-inch diameter PVC water main.

Design Basis: 1982 Virginia Waterworks Regulations

Source: Well No. 1 - Yield Capacity - 15.6 gpm

15.6 gpm ÷ 0.5 gpm/ERC = 31 ERCs or 12,400 gpd

Well No. 1 - Pump Capacity - 18.0 gpm

18.0 gpm ÷ 0.5 gpm/ERC = 36 ERCs or 14,400 gpd

Storage: Atmospheric - 12,000 gallons
Pressure - 2,000 gallons
Total Effective Storage = 12,000 gal. + 1/3(2000 gal) = 12,667 gal

12,667 gal ÷ 200 gal/ERC = 63 ERCs or 25,200 gpd

Booster Pumps - Combined Pump Capacity - 231 gpm @ 109 feet TDH

(231 gpm - 50 gpm) x 1 ERC/gpm = 181 ERCs or 72,400 gpd

Therefore, based on the critical value above, this waterworks is permitted for a design capacity of 31 ERCs or 12,400 gpd.

TNH:cr

Storage Capacity: **Atmospheric-type storage tank** – 0.076 MG

Effective Vol. = π (15.33 ft)^2 ÷ 4 x (961.8 ft – 908 ft) = 9,930 ft^3 = 74,282 gallons

74,282 gallons ÷ 200 gal/ERC = 371 ERCs

371 ERCs x 400 gpd/ERC = 148,400 gpd

Hydropneumatic Tank – 2,500 gallons

2,500 gallons ÷ 3 = 833 gallons of effective storage

833 gal + 74,282 gal = 75,115 gallons of total storage

75,115 gallons ÷ 200 gal/ERC = 375 ERCs

Therefore, based on the critical value above (well yield), this waterworks will be permitted for a design capacity of 74,800 gpd.